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SAMENA TRENDS

FOR SAMENA TELECOMMUNICATIONS COUNCIL'S MEMBERS

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Eng. Saleh Abdullah Al Abdooli
Chief Executive Officer
Etisalat Group

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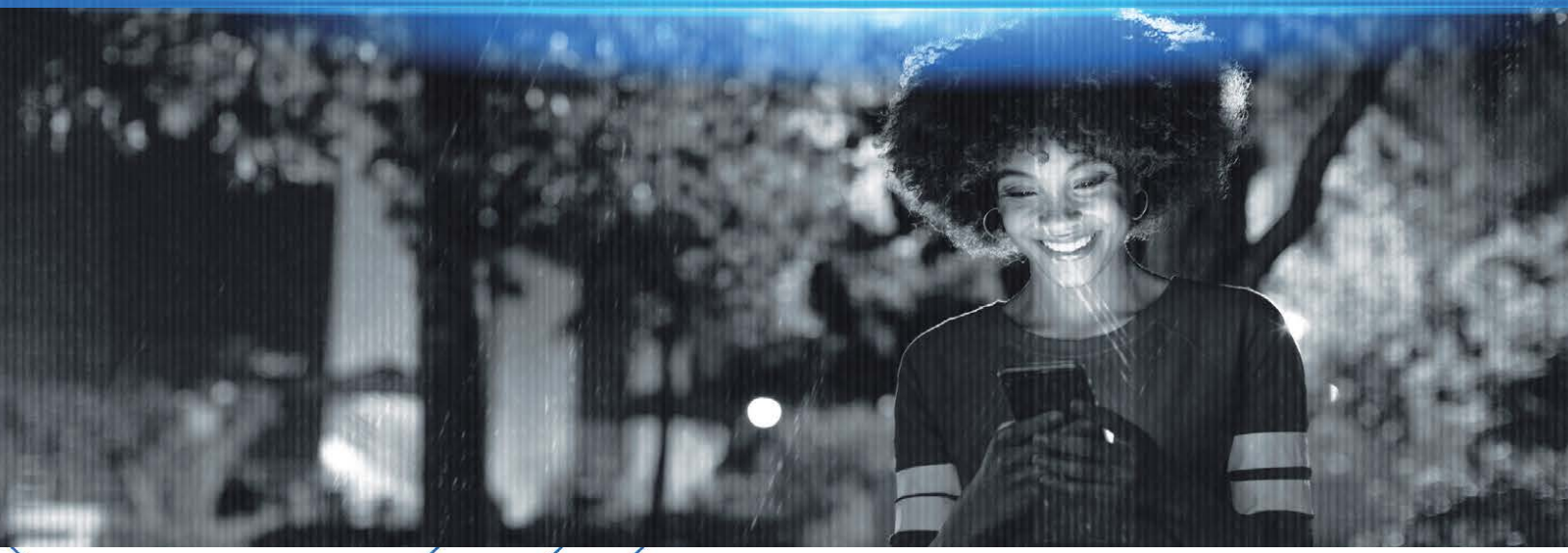

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UAE Leads on in 5G, AI, IT, and Space

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Immersive Technologies for Consumer & Enterprise Use

While immersive technologies, that is AR (augmented reality), VR (virtual reality), or MR (mixed reality) still require several more years to achieve maturity, experimentation and use-specific implementations are well underway. There exists a wide range of possibilities that have been linked to immersive technologies. For example, AR offers convenience in use, scalability, new types of content, new user experiences, and these benefits are important across large industries that account for most of the world's job market.

Immersive technologies take the user right into "alternative reality" while the user remains physically present in the existing environment. The healthcare industry, for instance, has recently realized that immersive technology can help in pain management for patients that require an alternative sensory experience, which can distract them temporarily while they recuperate. Moreover, full-fledged surgery simulations can be conducted. Immersive Technology can also assist medical practitioners in collaborating with or observing their counterparts in surgical procedures in remote areas or in hospitals across borders. This also suggests that medical immersive technology could actually promote doctor-to-patient empathy and make the recovery process quicker.

Immersive technologies were first implemented in the gaming industry, resulting in a perception that these technologies were meant only for gaming. With emerging use-cases, as now desired for the proliferation of 5G services and better utilization of 4G infrastructure investments, this perception, however, has shifted toward the realization that immersive technologies, in fact, have a decisive role to play in Industry 4.0.

An entirely new realm of digital experiences, close to real-life experiences, awaits the world and numerous sectors, adjacent to Telecom Industry, such as financial services, healthcare services, educational facilities, multimedia content, e-government, among others, can directly benefit from immersive technologies. What needs to be done by Telecom Operators is to implement any or a combination of immersive technologies first to their own maintenance, business intelligence gathering, auditing, and inventory management procedures, and then extend the implementation to other industries and sectors where such technologies can dramatically improve business process efficiencies and enhance the human and human-to-machine interactive experience.

In the age intelligent connectivity and immersive digital experiences, and given our region's focus on 5G, it is a matter of both interest and need that we look into immediately implementable use-cases for immersive technologies across all industries and sectors.

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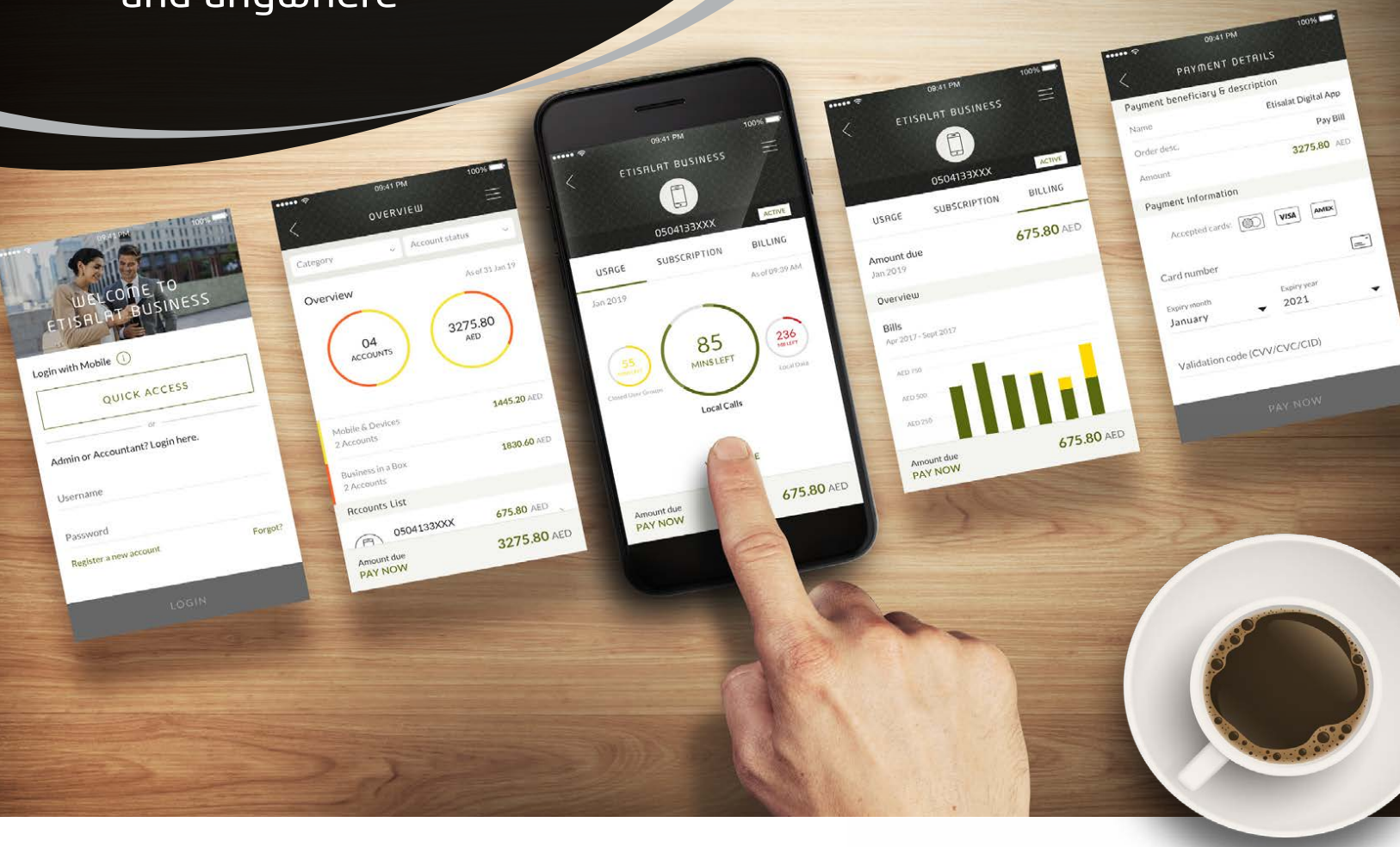

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Etisalat Speaks to SAMENA Council

Eng. Saleh Abdullah Al Abdooli
Chief Executive Officer
Etisalat Group

> *While we continue to deploy the 5G network across the UAE, 4G LTE network coverage reached 99.4 percent and 3G covers 99.8 percent. FTTH has reached 95.7 percent of homes across the UAE, maintaining the UAE's position as a global leader in FTTH for the third consecutive year, according to the latest international report from the FTTH council.*

Q. What was Etisalat's focus at GITEX Technology Week this year?

A. GITEX is recognised as the most important technology event in the region and is well positioned globally due to the large presence of renowned international participants. This annual event is a unique platform to showcase to the world our advancements, new cutting-edge solutions & technologies, and to communicate with our partners and customers the latest in innovation that will make a major impact to all industries.

'5G A World without Limits' was Etisalat's theme this year, bringing to life innovative use cases across industry verticals, such as mobility, retail, healthcare, manufacturing, aviation, energy and logistics.

Inspired by our strategy of 'Driving the Digital Future to Empower Societies' we showcased 5G powered innovations that took visitors on a journey into the future, where they witnessed the impossible of the past, which has become the reality of today.

We also demonstrated AI, robotics, IoT, AR and VR technologies, with autonomous transportation in mobility, robotics in healthcare, underskin implants in the retail area and a unique 5G VR experience in entertainment. Many of these technology showcases made their presence for the first time globally on our stand during GITEX 2019.

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Q. How do you evaluate Etisalat's performance in 2019 so far?

A. Etisalat Group demonstrated strong performance during the first half of the year due to our sincere efforts to drive growth and invest in future networks while focusing on enabling innovation, transform the ecosystem and accelerating digital transformation across our operations.

Etisalat Group achieved AED 25.9 billion of revenues while consolidated net profits reached AED 4.4 billion representing 3.1 percent increase YoY.

In terms of subscribers in UAE for the H1 of 2019, it reached 12.4 million subscribers while aggregate base reached 143 million, representing a year over year increase of 2%.

Reaching the top is hard but maintaining a leadership position is harder. Etisalat has successfully achieved the most valuable brand in the Middle East, and the most valuable portfolio brand in the MENA region for the third year in a row.

Our portfolio surpassed USD 10 bn, a great feat that puts Etisalat head to head with global renowned brands and ahead of many key regional brands.

Q. Etisalat has set many benchmarks in 5G, can you take us through your 5G journey?

A. 5G today has opened up a world of opportunities for operators spurring innovation across many industries to provide a platform enabling emergent technologies to become an integral part of our economy and lifestyle. 5G is expected to open growth opportunities for the telecom industry with forecasted global revenues to touch $2.2 trillion in the next 10 years.

Our success in 5G was not built overnight but due to our long term planning and investments in our infrastructure, first trials and strategic partnerships started as far back as 2014.

Etisalat set a major benchmark in the industry by becoming the first telco in MENA in May 2018 to launch the commercial 5G network providing fixed wireless service in the UAE.

This was followed by another major substantial breakthrough in our 5G journey by connecting and partnering with Expo 2020 as the first major commercial customer in the Middle East, Africa and South Asia (MEASA) region to access 5G services. Etisalat connected Expo 2020 Dubai to its network, leading it to be the first World Expo to witness the 5G revolution.

In May 2019, Etisalat was the first telecom operator in MENA to enable its customers to experience the power of the 5G network and release the first 5G handset before many others.

Etisalat also became the first telco in MENA to provide indoor 5G coverage in selected buildings in the country. Abu Dhabi airport became the first international terminal to be powered with indoor ultra-high speed 5G connectivity.

2019, so far has been a landmark year for Etisalat 5G advancements, but this is only the beginning.

> *5G today has opened up a world of opportunities for operators spurring innovation across many industries to provide a platform enabling emergent technologies to become an integral part of our economy and lifestyle. 5G is expected to open growth opportunities for the telecom industry with forecasted global revenues to touch $2.2 trillion in the next 10 years.*

Q. Telecom Infrastructure is the backbone of success. What are your latest advancements on network and infrastructure in the UAE?

A. Our customers have seen the evolution of technology with every generation, right from 1G to 2G offering mobile for the masses, and then to 3G which was the beginning of the broadband era, moving to 4G bringing the real multimedia experience with higher speeds and capacities.

While we continue to deploy the 5G network across the UAE, 4G LTE network coverage reached 99.4 percent and 3G covers 99.8 percent. FTTH has reached 95.7 percent of homes across the UAE, maintaining the UAE's position as a global leader in FTTH for the third consecutive year, according to the latest international report from the FTTH council.

> *Etisalat continues to deploy 5G network across the country while 4G LTE network coverage reached 99.4 percent and 3G covering 99.8 percent*

Today UAE leads among the top 20 countries with the fastest fixed broadband speed and connectivity in the global fixed broadband speed index. Etisalat also witnessed increased broadband penetration this year with the doubling of the speed for businesses and consumers.

Q. How do you expect 5G and digital transformation to empower the future of business?

A. We expect businesses to lead the 5G revolution driven by their desire to meet their varied requirements from connecting a single location, to using networking to connecting smart facilities with the latest technologies like AI and robotics. All of which will open opportunities to increase revenue, reduce operational costs and create unique experiences.

You can witness the power of digital transformation in Etisalat's major projects like Dubai Parks and Resorts, our partnership with Ministry of Interior on creating a centralised smart fire alarm system 'Hassantuk' using state of the art IoT systems, and mega projects like Expo 2020 to be one of the most connected places on Earth with 5G powered innovations.

Our teams work closely with large enterprises as well as the SMB sector. The opening of the 'Hello Business Hub' added value through innovation enabling them with the right tools and services to drive into this digital future. We have also empowered small businesses by doubling of broadband speeds giving them the professional edge with higher speeds and making their business future ready.

With 5G, all businesses will leverage the low latency, high bandwidth and mass IoT ability to connect IoT devices. This will allow the deployment of integrated solutions and accelerate digital transformation, drive productivity improvements, efficiency gains and enhance customer efficiency faster than before.

Etisalat is well geared for the future offering high capacity solutions enabling new possibilities. We are working closely across different sectors in the adoption of 5G solutions mainly energy, manufacturing, healthcare, real estate and property. Technologies like AI and robotics will facilitate remote monitoring, analysing real time data, bring energy efficiency and enable autonomous transportation.

Q. How are Etisalat's digital capabilities changing the customer experience?

A. Customer experience remains at the core of everything we do, Etisalat is now looking at 5G to harness technologies to provide a customised and connected consumer experience by unifying data, taking advantage of AI-powered insights and create personalised consumer experiences.

Robotic process automation within Etisalat delivers automated solutions for greater efficiency and enhanced customer experience. This was part of our endeavour to bring digital transformation across our services. The 'Robotic Center of Excellence' focuses on performing monotonous tasks more accurately, securely and reliably.

> *Customer experience remains at the core of everything we do, Etisalat is now looking at 5G to harness technologies to provide a customised and connected consumer experience by unifying data, taking advantage of AI-powered insights and create personalised consumer experiences.*

Software robots are supporting back office agents to complete repetitive tasks about 70 percent faster making sure that along with the robots work is carried out efficiently.

The centre has software robots performing hundreds of thousands of autonomous transactions in Etisalat's Business Care and Order Management back office functions.

With 5G, such a centre will get a further boost to address the evolving needs of our customers, with services improving overall efficiency, speed and accuracy of our back office team, with the aim of further enhancing customer satisfaction.

Etisalat has also worked closely with financial entitites to make the best use of technology by bringing in flexibility and enable a cashless economy. The launch of eWallet, a new digital payment service is aimed at empowering UAE customers with safe, convenient and a flexible payment solution using a mobile device.

5G network and technologies will also transform the entertainment industry with fast download speeds, users can now enjoy seamlessly watching 4K and 8K videos on their 5G enabled connected devices. 5G will also facilitate and improve the gaming experience on the network, online and cloud boosting the development of VR and AR gaming devices.

Q. What can you tell us about Etisalat's international footprint and future expansion plans?

A. Currently, Etisalat's international portfolio spans over 16 countries in Asia (Pakistan and Afghanistan), Middle East (Saudi Arabia and UAE) and Africa (Morocco, Egypt, Mauritania, Mali, Gabon, Burkina Faso, Benin, Cote d'Ivoire, Togo, Niger, Central African Republic and Chad)

Our geographic footprint today continues to present substantial opportunities. As a group we have always acted diligently to protect the long-term interests of our shareholders by optimising and maintaining a healthy business portfolio and continue to seek good opportunities to grow as a company.

Maroc Telecom recently acquired 100 percent of Tigo Chad and Onatel successfully launched 4G services in Burkina Faso.

With our vision focused on 'Driving the Digital Future to Empower Societies', Etisalat is bringing digital transformation across our entities, business and services.

Etisalat Digital's recent acquisition of Help AG will accelerate the growth of both companies whilst enriching Etisalat's cybersecurity services. This acquisition is in line with Etisalat's strategy to enhance and diversify the Etisalat Digital portfolio.

UAE Leads on in 5G, AI, IT, and Space

The UAE is First in the Arab Region in Launching 5G According to Reports

The UAE is ranked first in the Arab Region and fourth globally in the launch and use of 5G networks, according to the Global Connectivity Index (The Connectivity Index), issued by Carphone Warehouse, specialized in technology benchmarking. The UAE is also the third globally in the overall ranking of the index, which measures the Total Connectivity Rating (Most Connected Countries) through four pillars: the movement infrastructure, information technology, global connectivity and social connectivity. This achievement is the result of the efforts of the telecommunications sector in general, and the Telecommunications Regulatory Authority (TRA) as the main driver of the launch of the 5G in the country. In recent years, TRA has worked in cooperation with operators to raise the telecom sector readiness to enter this state-of-the-art technology, which contributes to the UAE's global leadership and makes it first to deploy and operate 5G networks. In this context, H.E. Hamad Obaid Al Mansoori, TRA Director General, said: "The UAE is reaching positions and achievements on daily basis, which confirms its leadership and global competitiveness. A few days ago, the UAE has been ranked first in the Arab Region and 12th globally among the most competitive countries in the Digital Competitiveness Ranking 2019. Today, we are ranked first in the Arab Region and fourth globally in the use and application of 5G, ahead of the most advanced countries in the world. We will continue to strive for the lead with determination and strength, guided by the directives of our wise leadership, to achieve the UAE Vision 2021 and the National Agenda Goals." H.E. Al Mansoori indicated that this achievement shows that the UAE is on track to complete the digital transformation and enter the age of Artificial Intelligence and the Fourth Industrial Revolution. He added: "5G is the key to the future, and the main foundation for civilization milestones that the world will witness in the next few years. In the UAE, in the light of these facts, it is evident that we need to accelerate strategies and plans of 5G in terms of foresight, analysis and planning, in preparation to the transition from smart government to a full intelligent lifestyle where machines, devices and places connect in all directions to serve humanity. We have established the 5G Committee, in conjunction with the launch of the UAE 5G Strategy, which has held regular meetings with all sectors to identify their needs in relation to supportive operations for their activities in the ICT sector, to provide coverage and hardware support for 5G projects nationwide."

World's First Artificial Intelligence University Announced in the UAE

Abu Dhabi has announced the establishment of the Mohamed bin Zayed University of Artificial Intelligence (MBZUAI), the first graduate level, research-based AI University in the world. MBZUAI will enable graduate students, businesses, and governments to advance artificial intelligence, a statement said. The University is named after Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, who has long advocated for the UAE's development of human capital through knowledge and scientific thinking to take the nation into the future, it added. MBZUAI will provide all admitted students with a full scholarship, plus benefits such as a monthly allowance, health insurance, and accommodation. The university will also work with leading local and global companies to secure internships, and will also assist students in finding employment opportunities. The first class of graduate students will commence coursework at MBZUAI's Masdar City campus in September 2020. MBZUAI will introduce a new model of academia and research to the field of AI, providing students and faculty access to some of the world's most advanced AI systems to unleash its potential for economic and societal development. Dr. Sultan Ahmed Al Jaber, UAE Minister of State, who has been appointed chair of the MBZUAI board of trustees and is spearheading the establishment of the University, said: "Mohamed bin Zayed University of Artificial Intelligence aligns with the vision of the UAE leadership that is based on sustainable development, progress and the overall well-being of humanity and underpinned by capacity-building and active participation in finding practical solutions based on innovation and state-of-the-art technology."

As such, the Mohamed bin Zayed University of Artificial Intelligence is an open invitation from Abu Dhabi to the world to unleash AI's full potential. "AI is already changing the world, but we can achieve so much more if we allow the limitless imagination of the human mind to fully explore it," he added. "The university will bring the discipline of AI into the forefront, molding and empowering creative pioneers who can lead us to a new AI empowered era." Experts from around the world have been selected for the university's board of trustees. They include MBZUAI interim president, Professor Sir Michael Brady, professor of Oncological Imaging at the University of Oxford in the UK; Professor Anil K Jain, a University Distinguished Professor at Michigan State University, US; Professor Andrew Chi-Chih Yao, Dean of the Institute for Interdisciplinary Information Sciences at Tsinghua University, Beijing, China; Dr Kai-Fu Lee, a technology executive and venture capitalist based in Beijing, China; Professor Daniela Rus, Director of Massachusetts Institute of Technology (MIT) Computer Science and Artificial Intelligence Laboratory (CSAIL), US, and Peng Xiao, CEO of Group 42. The trustees will be supported by an advisory board, chaired by Omar Al Olama, Minister of State for Artificial Intelligence. The announcement comes as AI is set to have a transformational impact on the global economy, with experts estimating that, by 2030, AI could contribute nearly $16 trillion. Experts now estimate that, by 2030, AI's contribution to the UAE's GDP will rise to nearly 14 percent – the largest GDP share in the Middle East. Al Jaber added: "The launch of the Mohamed bin Zayed University of Artificial Intelligence is a clear demonstration of the UAE's commitment to encouraging innovation and empowering younger generations in the UAE and around the world." The university will offer Master of Science (MSc) and PhD level programs in key areas of AI – Machine Learning, Computer Vision, and Natural Language Processing – while also engaging policymakers and businesses around the world so that AI is harnessed responsibly as a force for positive transformation. MBZUAI will also bring together experts from the AI community by hosting regional and international conferences, seminars and workshops. Professor Brady said: "Following decades of research into machine learning and artificial intelligence, we are now at a turning point in the widespread application of advanced intelligence. That evolution is—among other things—creating exciting new career opportunities in nearly every sector of society. At MBZUAI, we will support students to capture those opportunities and to magnify their contribution to the field of AI globally."

UAE's IT Spend to Top US$6 Billion in 2019

IT spending in the UAE is expected to grow by a compound annual growth rate (CAGR) of 8 per cent to reach Dh23.1 billion ($6.28 billion) by the end of 2019, new analysis from Dubai Chamber of Commerce and Industry has revealed. The analysis, based on recent data from Fitch Solutions, was released on the sidelines of Gitex Technology Week 2019. The data showed IT spending in the UAE increasing at a CAGR of 2.3 per cent between 2014 and 2018, with this value forecast to grow by 7.2 per cent annually over the next five years. Digitization of the UAE economy, growing adoption of Internet of Things (IoT) technologies and Expo 2020 Dubai were identified as key factors supporting the robust outlook for the sector. According to the findings, the IT sector accounted for Dh21.4 billion or 1.4 per cent of the UAE's GDP in 2018. IT services sales in UAE reached a record Dh11.4 billion in 2018 and recorded double-digit year-over-year (y-o-y) growth of 10.2 per cent. Computer hardware sales in the UAE registered a 6.7 per cent y-o-y uptick last year to hit Dh6.9 billion, while software sales grew by 9.7 per cent, reaching a value of Dh3 billion. Hardware sales, which include personal computers and servers, were mainly driven by strong demand from businesses and consumers, as well as economic diversification plans. Personal computers (PCs) and server sales are the major components of computer hardware. According to the findings, the UAE has one of the highest household PC penetration rates in the region. Purchases of PCs by consumers are expected to maintain momentum as Smartphones are seen as complementary products to computers rather than substitutes. Several global companies like Amazon Web Services and Alibaba have invested in the UAE's IT market in recent years which have strengthened business confidence in the market. As a result, the supply of IT services has increased in line with consumer demand in the region. The UAE remains the most attractive IT market in the region and the country continues to attract industry leaders from around the world. Companies will likely continue to invest in IT infrastructure, especially in network systems, hardware and software over the next few years. The UAE's IT market offers a wealth of business opportunities for vendors and investors. Demand for Cybersecurity software and services is projected to increase as public and private sector players look to reduce the risk of Cyberattacks and adopt cloud computing and Internet of Things solutions. Companies operating in key economic sectors such as energy and financial services are expected to maintain high levels of spending on IT products. Financial firms are mainly focused on buying IT products related to banking, mobile banking, payment solutions, customer data analysis, stock trading and asset management platforms. On the other hand, oil and gas companies will likely to spend on smart mining solutions as part of their aims to enhance operational efficiency. More businesses are purchasing IT products which monitor production and employee performance as there is strong demand for data collection, analysis and automation services. In addition, the UAE is expected to scale up investments in artificial intelligence and blockchain solutions – a trend that should lead to more growth opportunities for businesses.

UAE Unveils National Space Strategy 2030

UAE Space Agency (UAESA) has announced the details of its National Space Strategy 2030 and National Space Investment Plan, which complement the regulatory and legislative framework of the UAE's national space sector. During the ceremony held in Abu Dhabi, the UAE Space Agency shared details of its National Space Strategy, which was approved by the Cabinet of the UAE, chaired by HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, and the ruler of Dubai. The strategy aims to enhance the space sector's contribution to the national economy and promote the UAE's regional and international presence in the space sector. It also strives to support the transition to a knowledge-based economy, create an effective regulatory environment, attract talent and develop human capacity, stimulate creativity among young people, as well as develop partnerships with industrial, educational, and research institutions while increasing international collaboration. The National Space Strategy aims to realize six main goals, which include providing competitive and world-class space services; enhancing advanced local capacity in space science, research and developing and manufacturing space technology; launching inspiring space missions; establishing high-level national expertise in the space sector; forging effective local and global partnerships and investments in the space industry; and developing a future-proof supportive legislative environment and infrastructure across the sector. These goals will be achieved through the implementation of more than 20 comprehensive programs and 80 initiatives. Moreover, the event also marked the announcement of the National Space Investment Plan, which seeks to realize the goals of UAE Vision 2021 and UAE Centennial 2071, which collectively aim to make the UAE the world's leading country in economic, social, and environmental fields. The plan is in line with the Higher Policy for Science, Technology, Innovation and the strategy for the UAE's Fourth Industrial Revolution (4IR). In addition, the plan aims to make the UAE a major regional and global hub for space activities by building a competitive national economy based on knowledge, innovation, and future applications that integrate the latest physical, digital, and biological technologies; attracting small and medium-sized businesses through promoting investment in the space industry; and facilitating the work of the companies in the industry. Dr. Mohamed Nasser Al Ahbabi, director general of the UAE Space Agency, said: "This strategy aims to support the realization of the UAE's vision in the space sector with the various elements that fall under its umbrella, including science, technology, applications and services. It also covers all the governmental, commercial and scientific activities of various space sector organizations, collaborating with other governmental entities, as well as academic institutions and space research and development centers." "The investment plan seeks to increase the national space sector's contribution to economic diversification and attract foreign investment in the national space sector. Moreover, it aims to transform the UAE into the go-to destination for investors wishing to participate in the space sector," added Dr. Al Ahbabi. "These documents represent the fruits of the continuous and extraordinary efforts of our exceptional team at the UAE Space Agency. The team has reviewed years of achievements and studied all aspects of the space sector, discovering its strengths, capabilities and opportunities in order to build upon the incredible success we have experienced since our founding five years ago," he concluded. Nasser Al Rashidi, director of Space Policy & Regulations at the UAE Space Agency said: "The National Space Strategy aims to ensure the industry's sustainable growth over the next decade and beyond. Thus, it was developed following a series of national and international economic and technical studies. The strategy also includes programs and initiatives that seek to consolidate, develop and sustain the integrated structure of the national space sector, thereby supporting its journey towards global competitiveness." "Through the Space Investment Plan, the UAE Space Agency is working to devise the activities, mechanisms, and tools necessary to stimulate entrepreneurship and attract more local and international investment to the space sector. "In the next stage, the Agency will supervise the implementation of eight activities identified by the plan through coordination, collaborations, and partnerships with key players in the space industry on a local and international level, including those in the government, private, academic, or research and development sectors, as investments in these sectors complement one another," concluded Al Rashidi.

MEMBERS NEWS

STC Books an 8.7% Increase in Net Profit in 9M 2019

Saudi Telecom Company (STC) has published its financial results for the nine months ended 30 June 2019, reporting an 8.7% increase in net profit to SAR8.344 billion (USD2.22 billion) from SAR7.674 billion in the corresponding period a year earlier. The company attributed the positive result to a SAR2.355 billion increase in revenues, which resulted in a SAR2.079 billion rise in gross profit (up by 9.5% year-on-year). In the period under review, STC reported a 6.1% improvement in revenues to SAR41.103 billion (SAR38.748 billion in 9M 2018), while EBITDA reached SAR16.279 billion, up 12.7% y-o-y from SAR14.447 billion. Eng. Nasser Bin Sulaiman Al Nasser, STC Group CEO, stated: 'The increase in net profit for the nine-month period of this year compared to the corresponding period last year by 8.73%, and the increase in net profits for the third quarter compared to the same quarter the last year by 3.90%, indicates the company's constant strong performance supported by an increase in revenue from Consumer and Wholesale business units as well as STC's subsidiaries. The company today is playing a key role in enabling digital transformation, which is one of the main objectives of the Saudi Vision 2030. Not to mention, we have spared no efforts in investing and supporting innovative solutions as we have worked on developing digital payments, big data, use of cloud computing, Cybersecurity, IoT and artificial intelligence to remain among the best telecommunication and information technology companies in the world.'

STC Academy Launched the First Exclusive Program in KSA with Google

STC Academy is happy to have launched the first exclusive program in KSA with Google, the Digital Guru program. Dr. Mouhdi, GM of ICT School in STC Academy, stated that it will help in developing and boosting the digital knowledge in the business market of the country. Participants taking this program run through a series of colored belts where each belt represents a different focus. We align with the importance of developing the workforce in the Kingdom as participants will practice using Google tools to help them become better professionals. As one of STC Academy's main mandates, it establishes itself as a digital pioneer in KSA and an arm for boosting digital knowledge in the business market. George Achkar, the Digital Strategy Lead at Google, stated "It was a great honor facilitating our first ever Digital Guru sessions in KSA, made possible thanks to the entire STC Academy team. Thank you for your unprecedented collaboration, looking forward to many great successes to come."

STC Wins Best Annual Digital Report from MEIRA

Relations Association (MEIRA)'s awards ceremony in its eleventh edition held in Dubai. The award acknowledged STC's commitment to applying best reporting practices in its digital 2018 Annual Report, which reflects the pivotal role STC plays in enabling digital transformation, which is one of Saudi Vision 2030's key objectives, by providing the best modern technology services. The report, first inaugurated by Eng. Nasser Bin Suleiman Al Nasser, CEO of STC Group, in the presence of Ameen Al Shady, CFO, and Mohammed Abal Khail, Director General of Corporate Communications, allows investors, analysts, shareholders, and other members of the financial community to quickly and efficiently locate the information they need. The award reflects STC's commitment to using the highest disclosure and quality standards in terms of both content and design. The report was characterized by its comprehensiveness and impact in line with the company's strategy, which aims at applying the best practices of communication with its clients and investors, as well as offering them a better value by adopting best investor relations practices. The award is also a sign that STC is on the right track towards achieving its ambitious strategy, DARE, aimed at growing in new areas to promote itself as the right partner for the government, corporations, and SMEs alike, and performing its leading national role in implementing digital transformation in order to contribute to shaping the future of sustainable development in Saudi Arabia. The report reflected the robust financial status of STC and its interest in distributing cash dividends across its shareholders. It showed a 2.6% increase in revenue in 2018, reaching SR 51.963 million, while gross profit amounted to SR 30.546 million, i.e. a 6.9% increase. Operating profit reached SR 12.245 million, in a 115% increase, and net profits rose by 7.6% to reach SR 10.780 million compared to 2017. The company also maintained its market share growth, as the number of its fiber optic service clients rose by 18% compared to 2017. The report also highlighted STC's national role and contribution to achieving Vision 2030 by investing in the digitization of economy, which it did by investing in startup technologies by establishing a Venture Capital fund valued at USD 500 focused on investment in modern technologies:
3D printing, Artificial Intelligence (AI), drones, Virtual Reality (VR), and autonomous vehicles. The report also presented STC's achievements in 2018 in digital payments, Big Data, cloud computing, Cybersecurity, the Internet of Things (IoT), and AI, including the inauguration of the STC PAY service, a world-class large Data Center, as well as STC Academy to train highly skilled leaders, and the first 247/ digital store. The digital report also showed how STC promoted its local and regional leadership after it launched its first live 5G network location following the test completion, for the first time in the MENA region. This will be followed by many other 5G network locations throughout Saudi Arabia. STC is also working on completing the next phase of expanding the 5G network on a broader scale so at to keep up with the latest global technologies, raise digital services efficiency, and enrich customer experience across all Saudi cities. The report that won the MEIRA award also presented the progress STC has made both locally and internationally, after it won in the Board elections of GSMA, the world's largest organization of operators and manufacturers of mobile communications, to be one of the Board's 25 top telecom companies in the world. STC also won the King Abdul Aziz Award for Quality in its 1439 H - 2018 AD edition in the category of large service enterprises at the Gold level, for the second time since the award was started. This reflects the company's interest in quality, institutional work, and commitment to one of its core values, i.e. Customer First.

STC Offers 5G For Free in Saudi Arabia

STC has launched the 5G key for free for two months from the beginning of the subscription, which will give customers high speeds based on its strongest network in the Kingdom for its spread and reliability. The CEO of STC, Eng. Naser Al Naser, confirmed the Group's commitment to continue leading in the 5G era, confirming its leadership as the first operator in the Kingdom and the Middle East to launch the live network of the fifth generation in May 2018. As well as providing the first generation service for pilgrims in 1440 in 196 locations in Mecca, Al Madina and the Holy Places. He pointed out that the launch of the 5G package reflects STC's commitment to its pivotal role as a key enabler of digital transformation and the development of the telecommunications and information technology sector in the Kingdom, in a way that enriches people's lives in innovative ways based on modern technology.

SAR4 Billion - STC Contribution to Support Local Content and Localization

STC's Senior Vice President for Corporate Affairs, Eng. Abdullah Al Kanhal, confirmed that STC's contribution to local content and technology localization has reached SAR4 billion. Al Kanhal pointed out that the company has worked for nearly a decade to support localization opportunities in various sectors, such as fiber-optic networks and promoting opportunities for citizens in a number of new industries with international and local partners. During his speech last night at the launch of the Local Content Partnerships Initiative, organized by the Local Content and Government Procurement Authority, Al Kanhal stated that in 2015, STC established InspireU business incubator to support ICT entrepreneurs and entrepreneurs in the region. Today, STC hosts 28 projects with investments reaching to 60 million SR, and contributed to the creation of more than 100,000 jobs, including part-time jobs. He also added that in 2017, STC launched its own local content strategy through Rawafed program to develop an ambitious and sustainable framework in collaboration with its government and private partners to maximize local content. He pointed out that the program focused on the localization of industry, through developing industry infrastructure locally in the field of industries for the telecommunications and information technology sector in addition to the empowerment of small and medium enterprises. The program also focused on supporting human resources by raising the Saudization rates in the administrative functions in the ICT sector, as well as promoting innovation. During the ceremony, STC signed a cooperation agreement with the Local Content and Government Procurement Authority, after joining the Local Content Coordination Council of the Local Content Partnerships initiative, which was launched by the Authority as the first strategic initiative to establish a sustainable partnership with leading national companies and the private sector for content development. This agreement will increase local content in the Kingdom, which is a key pillar to diversify and direct the national economy according to the Kingdom's Vision 2030, by enabling local manufacturers and service providers to double their contributions to local content. Therefore, helping the Kingdom become a role model in raising the level of local content and enhancing its contribution to economic development.

STC Launch of 5G Corporate Services in KSA in 2020: Al Nasser

Eng. Nasser bin Sulaiman Al Nasser, STC Group CEO, confirmed that STC has increased the number of sites - equipped with 5G in various KSA regions, stressing that the Kingdom of Saudi Arabia is considered today among the best countries that have prepared for the launch of the Fifth Generation in KSA in early 2020. During the STC Media Club meeting held on the sidelines of GITEX 2019 in Dubai yesterday night, Al Nasser explained that KSA's support provided to the telecommunications sector has contributed to the development and growth of this sector, as well as improvement of its infrastructure in record time, in order to achieve the digital transformation aspirations in line with the objectives of the Saudi Vision 2030 and the National Transformation Program 2020.In this context, he pointed out that InspireU features 28 projects, with the total investment value amounting to SAR 60 million. Al Nasser added, "The market value of these investments is SAR 300 million. InspireU includes 16 million employees, and has contributed to the

creation of 160 thousand employment opportunities, including part-time jobs." For his part, Eng. Abdullah Al Kanhal, Senior VP of Corporate Affairs at STC, pointed out the impact of InspireU in supporting the innovation of innovative youth projects, with the support of STC, which provides financial and qualification support with the participation of experts from Silicon Valley, as well as all the required potential for these promising projects. On this occasion, new media specialist, Dr. Ammar Bakkar, showcased a presentation entitled "The Impact of 5G Networks on the Future of Telecommunications and Media". Furthermore, three supported projects were also highlighted, namely the consumable, micro-lending application "Sulfah", the "Carwah" project - providing integrated data and services to facilitate car rental services, and "Ayen" - aimed at helping in the assessment of the effectiveness of prefabricated houses.

STC, Honeywell Collaborate to Enable Digital Transformation for Kingdom's Mobile Workforce

Saudi Telecom Company (STC) inked a strategic collaboration agreement Thursday with global technology leader Honeywell, as part of the company's ongoing efforts to build a digital economy and provide modern specialized business services, a key enabler for the achievement of Saudi Vision 2030. The agreement was signed at GITEX Technology Week 2019 in Dubai, United Arab Emirates, by Eng. Riyad Muawwad, chairman of the board of directors of STC Solutions and senior vice president of STC Enterprise, and John Waldron, president and CEO of Honeywell Safety and Productivity Solutions (SPS). Under the terms of the agreement, STC will work with Honeywell to deploy advanced productivity solutions to help digitalize day-to-day operations for small and medium-sized enterprises (SMEs) that employ mobile workforces across various industries. Drawing on Honeywell's global expertise and class-leading hardware platforms, STC will create industry-specific productivity-as-a-service (PaaS) bundles that combine handheld industrial mobile computers and mobile printers with advanced data-connectivity and voice plans to help fieldworkers and vehicles stay connected with their company offices and warehouses. The bundles, which will be offered on a monthly subscription basis, will help drive competitive advantages for Saudi private and public sector entities, including ministries, with a focus on supporting advanced field service, maintenance, inspection and logistics capabilities. The solution will aid digitalization and economic diversification initiatives outlined by Vision 2030, and enables SME's to grow and expand their businesses at a lower cost. The solution also helps customers with large mobile workforces to migrate their existing handheld devices to the Android operating system before the Windows Mobile platform is discontinued in December 2019. Commenting on the signing, STC's Riyad Muawwad said: "STC is working to define the future of digital transformation in Saudi Arabia. We are leveraging our advanced cloud and data infrastructure capabilities to develop innovative solutions that will help streamline operations and boost the productivity of the Kingdom's workforce across the public and private sectors. By working with global technology leaders such as Honeywell, we are positioning ourselves to support the advancement of Saudi industry and the digital economy by delivering the latest technologies as part of our overarching strategy to become a world-class digital services provider." Honeywell's Waldron added: "Honeywell has been delivering cutting-edge technologies to Saudi Arabia for over 60 years and we are committed to advancing digital transformation initiatives in the Kingdom across key industries in line with Saudi Vision 2030. We are very proud to be collaborating with STC and look forward to leveraging our advanced solutions to empower the Kingdom's SME organizations." STC will bundle data and voice plans with a selection of Honeywell's handheld computers and mobile printers, including the Dolphin CT60, ScanPal EDA51, ScanPal EDA71, RP4 and RP2. The agreement also details how the telecom provider will explore further avenues of cooperation by leveraging Honeywell's technology and know-how to deliver smart cities solutions, as well as services for advanced building automation, smart electricity grids and other industrial applications.

STC Group Concludes 25 Cooperation Agreements to Enable Digital Transformation and 5G Services at GITEX 2019

STC Group concluded its participation in GITEX 2019, in Dubai, with the signature of more than 25 agreements with a number of major, international IT companies – such as Cisco, Ericsson, Huawei and Nokia -, as well as other government programs, institutions and local companies so as to enhance the Group's commitment to play a pivotal role in enabling digital transformation in both the public and private sectors in line with the Saudi Vision 2030, as well as in achieving STC's DARE Strategy targets to reinvent the customer experience and be dedicated to providing the best services in this respect. In this respect, the agreements included cooperation with each of Al Bawani and SBM to establish four data centers in Mecca, Jeddah, Al Qassim and Dammam, in addition to Cisco so as to regulate customer service operations, as well as Huawei to manage the mobile customer experience. Furthermore, an agreement was concluded with the Badir Technology Incubators and Accelerators Program - allowing STC Business to provide its services to the SME sector, as well as with Cisco to manage customer service operations. In this context, STC signed another contract with the Saudi Consolidated Engineering Company (Khatib & Alami) to develop the engineering design of the King Abdulaziz Telecommunications Complex in Riyadh, and concluded an agreement with the Saudi Digital Payments Company, in addition to a Memorandum of Understanding with the ABANA Enterprises Group Co., thus allowing integration between the Saudi Digital Payments Company and ABANA's cash management services provided. Within the same framework, STC entered into another agreement with Aldrees Petroleum and Transport Services Company, aimed at improving security and comfort during electronic payment transactions carried out at gas stations. In order to provide STC customers with the opportunity to use the STC Pay platform in pharmacies and markets, and to book flights and receive car rental services, STC signed four agreements with each of Al Nahdi Medical Company, Al-Sadhan-SPAR, Flynas and iDrive, in addition to another, similar one with Saco, thus allowing STC customers to pay and benefit from special discounts upon usage of such a payment method. And, with a view to improve the quality of services provided and meet the growing expectations of STC customers, including the Saudi youth, STC has entered into an agreement with MATRIXX Software, Inc. to lead the continued growth of its brand, and concluded a Memorandum of Understanding, thus allowing the use of Mrsool on its online STC Pay platform and accepting the payments of customers using this application to deliver orders.

STC Business and Badir Program Sign an agreement to Support Startups with Innovative Solutions

STC's stand in GITEX witnessed the signing of a cooperation agreement with Badir Technology Incubators and Accelerators Program which aims at supporting the establishment and growth of entrepreneurial and startup projects. The agreement was signed by Mohammed Al Hakbani, Vice President of Enterprise Sales at STC and Nawaf Al Sahhaf, the CEO of Badir Program, in presence of HRH Mohammed bin Khaled Abdulla Al-Faisal, Chairman of STC, and STC Group CEO Nasser Al-Nasser. The agreement aims at supporting startups in the technology field through innovative solutions that contribute to raising the added value of the project. STC Business offers many services to SMEs from the establishment of an enterprise's infrastructure to the day-to-day provision of technical services including phone, internet connection, and advanced services such as cloud computing, Cybersecurity solutions, sales management, and the Internet of Things (IoT). In this context, Al Hakbani emphasized the importance of small and medium enterprises. He said that this sector is the backbone of the economy in most countries of the world, as it accounts for more than 90% of the total number of enterprises worldwide and contributes to 50% of GDP. He added that STC seeks to support this sector given that it is a great

source of job opportunities. Statistics show that 50 to 60% of the total workforce works in enterprises classified as medium or small. As well as promote the concept of technology entrepreneurship and transform technology projects into successful business opportunities Badir Program seeks to support and develop the technology incubators industry in Saudi Arabia, as well as to promote the concept of technology entrepreneurship and transform technology projects into successful business opportunities. Badir Technology Incubators and Accelerators Program is among the most important national and creative environments supporting the establishment and growth of entrepreneurial projects and startups. It was founded in 2007 by King Abdulaziz City for Science and Technology to support technology-based business venture opportunities and develop technology entrepreneurship. Support of companies and startups incubated by Badir Program to accelerate the development of incubated technologies in this emerging category whose business ventures graduated from Badir Incubation Program. The program does this by providing telecom service and digital solution offers at special prices (within the powers of the Director General). This supports these startups in their digital development, provides them with the empowerment needed to deliver their work, and contributes to reducing their operational costs.

STC and SIF Conclude a Cooperation Agreement to Promote Local Content and Create Localization Opportunities

STC has concluded a joint cooperation agreement with the Saudi Industrial Fund (SIDF) to promote local content and create localization opportunities in various sectors, as part of the Tawteen Program. This Agreement - signed by STC Group CEO, Eng. Nasser bin Sulaiman Al Nasser and SIF CEO, Dr. Ibrahim bin Saad Al Mojel - aims at contributing to the promotion of local and foreign investments to increase local content, as well as at highlighting products' localization opportunities, and benefiting from the volume of purchases in major companies. In this respect, Tawteen - which contributes to the achievement of the national strategy of increasing KSA's local content - offers a number of advantages, including the provision of preferential financing terms and conditions implying a longer settlement period extending up to seven years and a grace period of two years, as well as the availability of a dedicated, fast track for projects enjoying a purchase agreement, and the possibility to link purchases with major national companies and provide consultancy services alike. Within the Rawafed program framework, STC has concluded a cooperation agreement with SIDF with a view to transferring international knowledge and expertise to startup projects, increasing the Saudization rate of leadership positions, supporting SMEs, ensuring industry localization, as well as supporting innovation and enabling digitization, as part of STC's commitment to achieving the Saudi Vision 2030 objectives of increasing the share of local content and enabling digital transformation. In this context, it is worth mentioning that Rawafed managed to achieve a 20-40% increase in Saudization, in addition to all of its efforts exerted in supporting small and medium-sized enterprises and localization of the industry. In 2018, the development and expansion of the manufacturing of optic fibers started to take place, in addition to the implementation of several plans, aimed at producing high-tech products and building 4 innovative centers.

Batelco Launches National Broadband Network Division

Batelco has officially launched National Broadband Network (BNET), the group's new independent wholesale unit resulting from the company's legal separation and restructuring into two separate entities focused on retail and wholesale operations, completed in May 2019. In line with the requirements of Bahrain's Fourth National Telecommunications Plan (NTP4) agreed in 2014, BNET will provide fiber broadband network services to all licensed operators including Batelco, whereas Batelco will focus solely on retail and corporate operations. NTP4 notably aims to provide internet access speeds of at least 100Mbps for up to 95% of homes in Bahrain and 1Gbps for all government and business entities. Speaking at a press event to announce the launch, Batelco Chairman Abdulla bin Khalifa Al Khalifa commented: 'The restructure of Batelco is now complete with independent management teams and human resources in place. BNET's teams are now working on the implementation of its strategic plans which focus on the development of the fiber-optic network across Bahrain and the provision of high-speed internet services for OLO's on a fair and competitive basis.'

Batelco and Avaya Bring Cloud solutions for Bahrain's Growing Small and Medium Businesses

Batelco, the leading digital solutions provider in the Kingdom of Bahrain has signed with Avaya, an agreement whereby Batelco will offer Avaya's market-leading portfolio of Contact Centre and Unified Communications solutions on an as-a-service basis through a cloud offering hosted in Bahrain. The agreement was signed by Batelco General Manager Enterprise Division Abderrahmane Mounir and Avaya Vice President – Middle East, Africa and Turkey Fadi Hani, during GITEX Technology Week 2019, where both companies are demonstrating the latest innovations for the communications industry. The move is in line with the increasing customer demand for Avaya's solutions to be delivered through a cloud-based model. Batelco will offer public and private cloud-based deployments of Avaya's cloud solutions to customers and channel partners in Bahrain, hosting the solutions at its own data center. Avaya's cloud solutions are both flexible and scalable, eliminating the need for upfront capital investments. Customers need only pay for what they use, and can scale up easily as their businesses grow. And the solutions' enterprise-grade feature-sets mean that they are suitable for businesses of any size. "With businesses increasingly moving to cloud-based solutions, we saw a tremendous opportunity in partnering with Avaya to make its cloud solutions

available across a range of deployments – including public and private cloud. This fits in with Batelco's strategy for the enterprise division, offering cutting edge digital solutions. Batelco aims at providing the sector with practical, flexible and affordable solutions that enables growth in the segment while providing high levels of performance and efficiency through the application of the latest cloud based solutions," said Abderrahmane Mounir, GM Enterprise at Batelco. This launch forms part of Avaya's near global deployment of its virtual cloud infrastructure, with over 3.6 million cloud seats deployed to date. Avaya is a market leader with 145 million seats worldwide, making it uniquely positioned to help customers transition to the cloud at scale. The announcement is also the latest in a long partnership between Avaya and Batelco, which is a Gold Partner in Avaya's Edge channel program. Last year, the two companies completed a number of strategic digital transformation projects with the Kingdom's private and public sector organizations. Fadi Hani, Vice President – Middle East, Africa and Turkey, Avaya, said: "With this announcement, we are taking our long-standing partnership with Batelco to new heights, and we're helping to facilitate cloud freedom for businesses in Bahrain. The idea is to enable local organizations, of any size, to embrace cloud-based UC and CC solutions at the pace and through the path of their choice. Our partnership with Batelco will support this."

Batelco to Shut Down 2G Network

Batelco has informed customers that its 2G network will be phased out by 31 December 2019. The company notes the move is intended to free up network capacity for the deployment of 5G mobile technology and enable it to meet the rapidly growing demands of its customers. All 2G device users have been urged to upgrade their devices and replace their SIM cards to support 3G/4G networks.

du, Wipro Partner Up to Launch IoT Security Platform in UAE

du, from Emirates Integrated Telecommunications Company (EITC), announced it has entered a partnership with Wipro Limited, a leading global information technology, consulting and business process services company, to roll out their purpose-built Internet of Things (IoT) Identity and Access Management platform for the UAE. The IoT security platform aims at addressing potential threats and securing devices and information, as well as adding policy-driven credential management and end-to-end data encryption, while enabling prompt integration and interoperability, according to a press release. Andrew Ward, Senior Vice President ICT Products at du, said: "As the world is becoming more connected, it's our responsibility to offer innovative secure solutions to better manage IoT environments. In partnership with Wipro, we can now enable businesses across the UAE with a robust, device-centric Identity and Access Management platform to ensure trust, privacy and security of data." This IoT innovation will play a key role across major industries in the UAE by helping enterprises to maintain integrity, privacy, and compliance, ensuring that their data is safe and secure while enabling efficiencies. Bharat Raigangar, regional head and business partner (IMEA) - Cybersecurity & Risk at Wipro Limited said: "We are excited to partner with du to offer an Identity and Access Management platform (IAM) for IoT. It will deliver secure outcomes for businesses needing trust and identity management at the center of their operations. Wipro's technology expertise and understanding of domain-specific business challenges coupled with du's capabilities will allow us to create modern IT infrastructure solutions." This partnership was announced on the sidelines of du's participation at GITEX Technology Week taking place in Dubai until Thursday, 10 October 2019.

du Satisfied with Huawei 5G Security

UAE-based operator du became the latest to back Huawei, with CTO Saleem Albalooshi stating the company has no concerns over the security of the Chinese vendor's kit, Reuters reported. Albalooshi explained Huawei is deploying 5G equipment for the operator and its research had not uncovered any "security holes" with the vendor's gear, "specifically in 5G", the news agency stated. He added du is concerned with US pressure around the use of Huawei equipment, specifically threats by the nation to suspend the sharing of information by intelligence services. However, the company's approach will be guided by the UAE government and regulations, he explained. du's backing adds to support Huawei gleaned from Malaysian operator Maxis and Russia-based MTS, Arab News reported. The vendor reportedly also gained backing from Norwegian cabinet minister Nikolai Astrup, who told Reuters the country wasn't planning to block Huawei from working on 5G networks. Huawei has repeatedly denied its equipment is a security threat.

du Empowers UAE Businesses' Digital Journeys with Seamless Multi-Cloud Workload Protection Service

du, from Emirates Integrated Telecommunications Company (EITC), has today announced the launch of its latest cloud security solution, Multi-Cloud Workload Protection as a Service, in partnership with Trend Micro, a global leader in Cybersecurity solutions. The solution was announced during GITEX Technology Week 2019. In response to the increasing number and variety of cyber threats, the Cloud Workload Protection Service from du will provide customers with a locally hosted, unified, security management experience that will help them to accelerate compliance and to secure workloads hosted in their hybrid and multi-cloud environments. Reflecting the strong demand for cloud-based cyber security, the Middle East and North Africa's cloud security spend is USD 9 billion in 2019, a 108 percent increase over 2018, according to a recent Gartner report. du's Multi-Cloud Workload Protection as a Service, in partnership with Trend Micro, delivers a multi-layered automated approach to protect hybrid cloud workloads and container environments against known and unknown threats including malware and vulnerabilities, helping to secure business data and applications all from within one solution.

du Empowers Department of Finance to Migrate to Dubai Pulse

Building on its role as a Strategic Partner for Smart Dubai Office, du, from Emirates Integrated Telecommunications Company (EITC), will be facilitating the Department of Finance's (DoF) in Dubai to transfer its applications to Dubai Pulse, together with licenses and Managed Services. During GITEX du signs DoF as their customer for Dubai Pulse, to make the Smart City vision come to life. As the central government entity in charge of government finance, DOF chooses du to provide highly available and scalable cloud services, which will meet its requirements in a secure and optimal architecture with disaster recovery to ensure availability of all these applications, and readiness to handle different situations.

'Another Major Milestone by du for Dubai Pulse'

Farid Faraidooni, Deputy CEO - Enterprise Solutions, du, said:

"Enabling the digital journey and strategic mandates of government entities like the Department of Finance is a role we at du take great pride in accomplishing. Backed by proven technological capabilities and expertise, we are thrilled to help the DoF's cloud vision reach fruition and to be working in unison with esteemed public sector organizations to achieve the innovative visions set out by the UAE leadership." Huda Hamdan Al Shaikh, Executive Director, Corporate Services Sector, Department of Finance in Dubai, said: "Supporting the Smart City vision and agenda of Smart Dubai Office is also in line with the efforts of the UAE leadership to transform Dubai into one of the world's most advanced cities. By enlisting du to support the department's cloud-based needs, we are one step closer to reaching this reality and we believe this will provide a global model for the implementation of world-leading technologies that provide world-leading outcomes for individuals, public entities, and communities."

'End-to-End Cloud Solutions'

DoF's requirements included the ability to host and manage its Enterprise Performance Management platform, IT service management platform, corporate Data insight and Discovery application, MS Share Point based intranet, and Internet applications and Reporting services on the cloud-based Dubai Pulse platform. In addition, database consolidation will be provided through the MS SQL Enterprise service. The administration and management of all Infrastructure components along with a Business Continuity plan is also required. Launched by the Smart Dubai Office in partnership with du, Dubai Pulse offers virtual solutions to cater to web, application, database and shared services on the Smart City platform.

du & Ajman X Sign MoU to Collaborate on U5GIG Platform

du, from Emirates Integrated Telecommunications Company (EITC), has signed a Memorandum of Agreement (MoU) with Ajman X to collaborate on 5G, Artificial Intelligence (AI), and Internet of Things (IoT) development under the UAE 5G Innovation Gate (U5GIG) program. The MoU was signed during GITEX Technology Week 2019 by Saleem Al Blooshi, Chief Technology Officer (CTO) at EITC and Sheikha - Noora Humaid AlNuaimi, Director of AjmanX. Under the MoU framework, du and Ajman X will work together in the development of a 5G/IoT ecosystem in order to achieve early 5G, AI, and IoT use cases from 2020 onwards. The collaboration will also enable du and Ajman X to create an open platform for research and development geared towards standardizing these next generation technologies in the UAE. SHK. Noora AlNuaimi, Ajman X, said: "Accelerating the efficiency and speed of Ajman's government entities is a key mandate for energizing the Emirate to address challenges and achieve ambitious goals. With the signing of this MoU, we are proud to be directly involved in stimulating Ajman's future progress by developing future-facing technological methods and innovation pathways within the framework of supporting Ajman Vision 2021." Saleem Al Blooshi, CTO at EITC, said: "Robust partner ecosystems are poised to play an integral role in the proliferation of 5G, AI, and IoT advancements. U5GIG is a vital innovation hub and platform in exploring these evolving future technologies. That's why du is committed to providing expertise, technology leadership, and industry nous via this influential partner ecosystem to bring the connected visions of the UAE leadership to life." Hosted in Dubai Silicon Oasis, U5GIG is a practical and innovative initiative focused on developing 5G standards by 2020 and beyond. This vision was inspired by HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President of the UAE and Ruler of Dubai, with an eye towards UAE innovation and Dubai Future Accelerators. U5GIG is a consortium that consists of technical and academic organizations in the UAE and global telecom vendors with the aim of planning and utilizing expertise to define and develop a global 5G network that will radically change lives across the UAE.

du & Shopmatic to Collaborate on e-Commerce Platform for SME Customers

du, from Emirates Integrated Telecommunications Company (EITC), has announced a Partnership Agreement with Shopmatic, which will see the two organizations collaborate to launch an e-commerce web solution that will serve the UAE's Small-to-Medium Enterprise (SME) sector. The announcement took place at du's stand during GITEX Technology Week, in which du reiterated its positioning as a leading one-stop-shop for SMEs seeking digitally transformative business solutions and products. In the UAE's highly digitalized marketplaces, e-commerce has emerged as a vital business function for SME players. With the launch of innovative Digital Services, du's objective is to give the confidence to retailers to scale up their business online with an intuitive unlimited e-commerce platform for an unbeatable price. With Dubai's Development of Economic Department (DED) introducing various e-trading licenses highlighting the city as an e-commerce hub, traders are now able to obtain an "e-trader" license that allows them to conduct business like selling products or services through popular social media applications. Through du's commitment to empowering business continuity and growth, this partnership will enable du to offer customers an enriched digital service in the form of a white label e-commerce platform with a 3, 6 or 12-month Subscription-based payment option. Customers can also avail of a Transaction model in which customers pay 3% each transaction and no monthly fee. The du White label solution is easy to setup and manage and customers can simply modify the e-shop without the need of developers. This removes the hassle of hosting and deployment, programming, payment gateway, and site maintenance. The solution also offers plugins for integrated local payment gateway, delivery, and email campaigns, while offering best-in-class support and security. The e-commerce platform, which enables du SME customers to create an online shop in less than 15 minutes and enjoy subdomain and hosting.

Etisalat Digital and DMCC Partner to Transform Dubai's JLT to the First 5G Powered Smart District

Etisalat Digital partnered with DMCC - the world's flagship Free Zone and Government of Dubai Authority on commodities trade and enterprise – to transform Jumeirah Lakes Towers (JLT) into an innovative smart and sustainable district, powered by the 5G network. Both organizations have committed to the comprehensive roll out of smart services across one of Dubai's most popular residential communities and business districts. Scheduled to start later this month, innovation-led initiatives aim to make the DMCC, and JLT community, the first smart and sustainable district of its kind in the region. DMCC's partnership with Etisalat Digital falls in line with the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, the Vice President and Prime Minister of the United Arab Emirates and Ruler of Dubai and Smart Dubai 2021 strategy, for Dubai to become the happiest city on earth. "This is an exciting announcement and one that will come as welcome news to everyone connected to DMCC, the Jumeirah Lakes Towers community and the emirate of Dubai as a whole. DMCC's Smart and Sustainable District Strategy is about the intelligent application of data and technology to deliver a better quality of life for thousands of residents and companies in Jumeirah Lakes Towers," said Feryal Ahmadi, Chief Operating Officer, DMCC. "With Etisalat Digital's support, DMCC will introduce a new wave of innovation to Dubai, and completely transform how we respond to the needs of the community. The smart solutions planned will accelerate our sustainability drive and increase safety, reduce health risks, lower pollution, boost social connectedness and ultimately, deliver a cleaner and more sustainable environment for all," she added. Etisalat Digital will roll out smart devices, services and platforms to drive efficiencies across public amenities, energy consumption, asset and building management. Etisalat Digital will also provide smart solutions related to parking, street lighting, air quality, noise pollution, environmental performance and traffic monitoring. "Etisalat Digital's strategic partnership with DMCC will transform the JLT community to become the first 5G powered smart district in the region, making it a more seamless, efficient and safe experience for its members, residents and visitors. Both entities will work together to empower the community, reduce environmental footprint, provide smart solutions to improve infrastructure and transportation and deliver efficient public utilities," said Salvador Anglada, Group Chief Business Officer, Etisalat. "This smart city project is in line with Etisalat's vision of 'Driving the Digital Future to empower societies' and commitment to support the government's vision as well as the development of smart technologies across the UAE," he added. DMCC's long-term Smart and Sustainable District Strategy focuses on three core pillars: operational efficiency, customer centricity and sustainability. Project updates will be communicated to stakeholders by DMCC in due course.

Etisalat 9M Profit Up 2.1%

Etisalat Group of the United Arab Emirates (UAE) has reported revenues of AED38.8 billion (USD10.6 billion) for the first nine months of 2019, while net profit rose 2.1% year-on-year to AED6.7 billion. EBITDA for the nine-month period climbed 2.0% to AED20.1 billion. Sales for the third quarter stood at AED13.0 billion while net profit amounted to AED2.3 billion. The group claimed 148 million subscribers across its operations in the Middle East, Africa and Asia, up 5% year-on-year. The total included 12.4 million customers in its domestic market. Saleh Abdullah Al Abdooli, CEO of Etisalat Group, said: 'Etisalat's performance in the third quarter demonstrates our agility in adapting to the rapid changes in the telecom industry; we have channeled our efforts towards leading the digital transformation with the successful rollout of 5G networks while equipping our operations with the next generation of technologies like AI and robotics.'

Etisalat Completes Standalone 5G Call

Etisalat of the United Arab Emirates (UAE) has completed what it claims was the first Standalone 5G call in the Middle East and North Africa (MENA) region. The test call was conducted using 100MHz of spectrum in the 3.5GHz band. Using a Standalone smartphone, download throughput of over 1.5Gbps was achieved, with an upload speed of 200Mbps. Unlike Non-Standalone (NSA) 5G, Standalone does not use 4G LTE for any control functions. Saeed Al Zarouni, Senior Vice President for Mobile Networks at Etisalat, said: 'This achievement has positioned UAE on a global platform, giving us an opportunity to share our experience and set an example for other operators in the region. The launch of 5G Standalone will enable the application of 5G use cases across industry verticals optimizing the capabilities of the network. This will also enable provisioning of the 5G network for automated and AI-based technologies.' According to TeleGeography's GlobalComms Database, Etisalat launched its 3.5GHz 5G network in the UAE in September 2018, though initially only in fixed-wireless mode. It began offering true mobile 5G services in May this year.

Etisalat, Nokia Demo World's First Single-Carrier, Terabit-Per-Second Field Trial

Nokia and Etisalat are laying claim to trialing the world's first terabit-per-second, single-carrier data transmission over an operator-deployed fiber network. To put that speed in perspective, Nokia said in its press release that a terabit-per-second is enough bandwidth to download the entire "Game of Thrones" video series in HD in under two seconds. The trial on United Arab Emirates-based Etisalat's network comes as Etisalat invests in core network infrastructure in anticipation of a new generation of high-bandwidth services including 5G. Nokia said the trial successfully transmitted a record 50.8 terabits per second using multiple wavelengths, each with a net information rate of 1.3 terabits per second, over a 93-kilometer fiber route of Etisalat's wavelength division multiplexing (WDM) network. The Nokia field trial showed that Etisalat's existing network could support the higher optical wavelength bit rates that will be required to support high-bandwidth services such as 5G extreme mobile broadband, fiber-to-the-home (FTTH) and data center interconnect (DCI) cloud services. In addition to the speeds, higher bit rates per wavelength enable power and space savings, improved network simplicity, as well as increased spectral efficiency and capacity. It also enables reduced cost per bit compared to optical networks composed of lower rate channels, according to Nokia. Using a single optical carrier operating at 100 Gigabaud, the terabit wavelengths tapped into Nokia Bell Labs' probabilistic constellation shaping (PCS) to intelligently shape the signal to achieve maximum capacity for the specific fiber route. Nokia said its Photonic Service Engine 3 was the first coherent digital signal processor to implement PCS. "The introduction of 5G will require a network that can support dramatic increases in bandwidth in a dynamic fashion," said Nokia's Sam Bucci, head of optical networking, in a statement. "This ground-breaking trial with Etisalat is testimony to Nokia's commitment to continue to invest in coherent and optical component technologies required to meet the 5G networking challenge at the lowest total cost of ownership for our customers." Details of the trial with Etisalat were published in a post-deadline paper at the European Conference on Optical Communication, held last week in Dublin, Ireland. Nokia has a proven track record for advancing the frontiers of optical transmission. It was the first to demonstrate single-carrier 100G transmission in a deployed production network in 2007, and the first to commercialize single-carrier 100G and 200G wavelengths in 2010 and 2013, respectively. More recently, the Nokia Bell Labs optical research team published the world's first terabit-per-second transmission lab trials in 2015 and 2017.

Etisalat Enabling the Future of Retail at GITEX Technology Week

Etisalat demonstrated the retail spaces of tomorrow at GITEX Technology Week with innovative and transformative showcases that can be enabled on the 5G network paving the way for future growth highlighting how smart technologies are becoming an integral part of the industry. During this year's edition, the demonstrations were intuitive and intelligent featuring technologies like technologies like AI, IoT, RFID, NFC, autonomous and robotics. The intelligent retail experience would help visitors witness the evolution of retail and at the same time experience a connected store. Now with the 5G network, it will become a critical enabler of these futuristic use cases opening up a world of opportunities for the retail sector. This year at GITEX, retail has showcases including AI assisted shopping, connected fashion, IoT self-checkout, autonomous vehicles, robotics and advanced payment solutions. The Neolix self-driving delivery vehicle helps track via an app and simply use their smartphone to access items once the vehicle arrives. Moby Mart is staff-less and can be put anywhere: from a small village, to the city centers, to airports, office building, etc. VICKI is an IOT self-checkout solution for retail understanding her customers' habits, preferences and even questions. Caper, the autonomous shopping cart is a self-service checkout on wheels that can with the help of built-in sensors, identify every item that a customer puts into it. The complete shopping experience in the retail area is AI-assisted utilizing state of the art facial recognition systems to identify specific users. Swisslog's robot-based solution ItemPiQ showcases highly efficient order processing solutions for single items and is designed for repeated, reliable picking of a wide range of items to fulfil fast delivery of orders at low operating costs. The AI powered robotic checkout assistant picks items at the checkout counter and identify each item being picked along with the price. At the same time there is another autonomous checkout that dismisses barcodes and recognizes the products immediately. There is also a lot analytics on the stand with technologies conducting real time face and body analysis. The advanced payment demonstration of the biocompatible NFC implant is a unique showcase completing the intelligent shopping experience using the microchip implanted in the hand. Imagine a seamless digital interaction for everyday transactions. For the fashionistas, the new connected fashion concept is framed in a realistic look and feel with visitors being able to interact with 'Furhat' the robot who will assist you in your complete shopping experience, the zone also consists of dynamic displays and interactive experiences, personalized shopping, product customization, offline pickup for online purchased orders. The retail area will also attract the foodies, with displays from 'Natufia Kitchen Garden', originally designed for Michelin star chefs is an environmental friendly concept encouraging chefs to grow their own herbs and vegetables right in their kitchen. The fully automated bread-making machine 'Breadbot', worlds first smoothie vending machine 'Alberts Robotic Smoothie Station', and a disruptive coffee experience with 'Robotic Barista' are the other attractions on the stand.

Etisalat Focuses on Health and Empowers 'People of Determination' with Smart Mobility Solutions at GITEX 2019

Etisalat this year at GITEX Technology Week had a major focus on smart solutions that focus on health and also empower the 'People of Determination' harnessing the power of 5G and innovative technologies like AI, robotics and IoT to improve their mobility, independence and ultimately their lives. WheeM-i (Wheelchairs Mobility Interface), a bicycle-sharing system equivalent for wheelchairs, made its world premiere at Etisalat's stand. This unique smart mobility showcase is in line with its long-established corporate social responsibility (CSR) strategy of extending its reach, offers and services across the community. BrightSign, created by Hadeel Ayoub, a Saudi tech innovator and inventor uses assistive technology to facilitate communication for individuals with speech disability. This wireless glove contains a number of motion and position sensors that gives feedback to a smartphone app using machine learning giving users complete control over sign language libraries. Dr. Ahmed bin Ali, Group Senior Vice President, Corporate Communications, Etisalat, said: "Our commitment to CSR has always

remained a major priority, and is integrated into our business activities to create value for subscribers and shareholders as well as communities that we serve. When it comes to 'people of determination', Etisalat has endeavored to enrich their user experience by providing them with various services and means of support. "Health is a major focus for Etisalat this year giving us an opportunity to showcase technologies that will transform the sector and is in line with overall strategy of 'Driving the Digital Future to Empower Societies'. We believe that everyone should have access to best quality of care. At Etisalat we aim to improve people's lives by use of digital health technologies and want to be the trusted digital health partner." The health solutions we are showcasing follow the journey from health prevention, early diagnosis, timely treatment & care, health monitoring to patient empowerment and engagement.

- 5G connected ambulance showed how the technology can help emergency services relay crucial information to prepare the hospital for receiving the patient and prioritizing treatment
- Pharmaself24 is a state-of-the-art system for setting up an automated 24-hour prescription collection point
- Comarch CardioVest is a solution used to perform preventive examinations, diagnostics and supervision of adult patients with cardiological disorders
- Comarch Life Wristband is an element of the care system that increases patients' security and gives them greater independence.
- Remote Maternity Care is a solution for safely monitoring a baby's heart rate and uterine contraction activity at home.
- Paxera Ultima is a powerful browser-based, all-encompassing multi-modality medical viewer.
- Stella Equinox is a clinical care and telehealth solution optimized for small to medium-sized clinical practices providing ambulatory care to patients.
- M2S virtual reality solution introduces a new and efficient way to screen eye related diseases using virtual reality.
- CarePassport is a trusted healthcare app for patients to aggregate and access all their medical data, including medical images, lab results, dental records, clinical reports and more from different healthcare providers.

UAE students, mainly from Khalifa University, Dubai University, Sharjah University and American University of Sharjah, visited the Etisalat stand to witness and learn from these showcases.

Omantel Secures Better Optimized Terms and Conditions on Its Syndicated Loan

Omantel, the leading telecommunications services provider in Oman successfully negotiated lower interest rates and extended term on its existing syndicated loan facilities. The current loan, which has an outstanding balance of US $ 680m, had its term extended to October 2024 and secured an interest rate reduction of 35 bps. Omantel, as part of its strategic initiatives took advantage of lower interest rate environment to renegotiate these loan facilities. The revised terms on the loan allows Omantel to reduce its financing costs and at the same time free up capital for investment in capital expenditure to maintain its leadership position in the telecom sector in the country. In addition, the financing transaction will serve Omantel's domestic business strategy and fulfil its commitment to provide innovative and next-generation services to its customers while allowing for value creation for its shareholders.

Omantel Signs MoU with Dell Technologies

Omantel, the Sultanate's largest integrated technology service provider, has signed a Memorandum of Understanding with Dell Technologies to further enhance its service offerings for the education sector and develop a platform to accelerate the modernization of Oman's education ecosystem. The MoU signing ceremony occurred at the Dell Technologies stand during the 39th annual Gitex Technology Week and was signed by Baha Al Lawati, Acting VP of Enterprise Business Unit at Omantel and Mohammed Amin, Senior Vice President, Middle East, Russia, Africa &Turkey at Dell Technologies. As part of the agreement, both parties will implement a smart education delivery platform for their customers. This fully managed Dell Technologies solution will deliver apps and virtual desktops to student-owned devices. It will facilitate a seamless experience for students without the need for additional infrastructure, helping to keep costs low whilst maximizing the student's productivity and efficiency. Furthermore, Dell Technologies will provide Omantel with solutions for both end-user computing and networking to improve and facilitate an efficient workflow environment. Omantel's education platform supported by Dell Technologies will enable students and teachers to access the latest technological tools to enhance and accelerate their learning and teaching capabilities respectively. Baha Al Lawati, Acting VP of Enterprise Business Unit at Omantel, said, "Our aspiration in relation to the educational sector in Oman is to build a totally enabled and connected ecosystem through ICT innovations. We have had several successes in the educational sector within the country, and we will continue to further augment this with a strategic partnership with Dell Technologies - a pioneer in the digital transformation arena. The offered solution will not only meet our highest requirements of continuing to provide quality service to our customers and their various stakeholders but also assist in developing an exceptional education system as outlined in the Oman 2040 Vision. This strategic alliance along with our wide reach of ICT solutions and services will help cement our position of being a national company that is determined to enrich the human capital within the county to achieve economic prosperity and high standards of living." Mohammed Amin, senior vice president, Middle East, Russia, Africa and Turkey at Dell Technologies, commented, "At Dell Technologies, our aim is to help organizations build their digital future and transform their infrastructure. We are well-positioned with end-to-end solutions to enable Omantel to modernize its IT, which in turn allows them to introduce advanced e-service offerings. We commend Omantel for their vision to use technology to transform the country's education sector and are excited to partner with them in their digital transformation journey."

Omantel Teams Up with Microsoft and BPS to Deliver ICT Innovations across the Sultanate

Omantel, the Sultanate's first and leading integrated telecommunications services provider at the 39th Gitex Technology Week in partnership with Microsoft and BPS, announced to jointly deliver ICT innovations and services across the sultanate. The partnership between Omantel, Microsoft and BPS is guided by the Omantel 3.0 transformation strategy to innovate, streamline, and revolutionise its digital smart home and business services. The offerings will be available to individuals and Small & Medium Size Enterprises (SMEs) through the bundle and standalone packages via Omantel different digital Channels, including Online store and Mobile Application. Consumers and SMEs will be able to purchase Microsoft products such as Office 365in a seamless digital experience. "Our vision at Omantel is to build a totally connected community through innovation," said Andrew Hanna, Chief Commercial Officer, Omantel. "And this strategic collaboration with Microsoft & BPS reinforces our ICT transformation efforts to achieve this vision in the Sultanate of Oman. Our priority has been to enable both

consumers and enterprises with various digital tools; hence, the combined power of Microsoft state-of-art products along with Omantel intelligent systems, infrastructure and outreach will add significant value in our customers' digital journey and boost their productivity." Office 365 is an integrated experience of apps and services, designed to empower users to pursue their passion, unlock creativity and productivity. With access to a suite of applications such as Word, Excel, PowerPoint, and security updates, it also provides Microsoft Teams, a collaborative hub for teamwork to conduct chats, organize meetings, and share files. "Mobility, productivity and collaboration have become the core needs of every end-user and business," said Sheikh Saif Hilal Al Hosni, Country Manager, Microsoft Bahrain & Oman. "As modern life and workplace evolve, it is important to adopt new tools that can help you get work done. Office 365 is the ultimate mobile collaborative platform designed to supercharge user productivity and enable them to make the most of their day. Our innovations, with

Omantel's expertise and breadth of presence in the sultanate – is a perfect partnership to accelerate technology adoption, and empower consumers and SMEs in the country to achieve more." "Using an end-to-end integration with BPS Marketplace that supported the streamlining and the digitalization of the delivery process, Omantel will deliver, within all its channels, the full suite of Office and Office 365 Business premium to end-customers. The partnership will provide the full catalogue of Microsoft ESD including all the app's and, most importantly, its latest version all the time and based on immediate customers demand," said Negibabouhabib, General Manager, BPS.

Orange Cleared for 26GHz 5G Trials

Orange laid out plans to test 5G in the 26GHz band through two experimental use cases in France, after securing approval to employ the spectrum from regulator Arcep. In a statement, Orange said using the band would allow it to explore new services based on 5G, which will stimulate collaboration across all sectors. The 26GHz, 40GHz and 66GHz band (known as mmWave) are hotly discussed in the industry because they are considered key to delivering certain 5G capabilities including ultra-high capacity and high-speed services. Orange's move comes after the GSMA last month called on governments across the globe to increase support for all three bands at the forthcoming ITU World Radiocommunication Conference in November. In May, the European Commission also adopted a plan to harmonize the rollout of 26GHz band, which all EU member states must complete by end-March 2020. Orange said it will assign experimental frequencies in the 26GHz band in two cities, using the projects to evaluate the performance of the frequency band "as well as the technical and environmental conditions in which those can be used". It plans to deploy a test network in the city of Rennes by the end of the year to evaluate the download of HD content in a train station, a project being conducted in partnership with Nokia and rail company SNCF. The experiment will involve deploying the test network; measurements of speed and coverage; and partner tests using Sony devices equipped with a Qualcomm modem and processor. Rail passengers will be able to connect to 5G hotspots and download "videos to their mobile or tablet in just a few seconds", said Orange. Additional consumer and business services will be looked into at a later stage. Its second experiment will take place at Orange Gardens 5G Lab in Chatillon, a site the operator has used to test 5G in the 3.4GHz to 3.8GHz since 2018. Orange said the lab will soon open its doors to partners and companies which want to evaluate the 26GHz 5G network's ability to deliver enhanced multimedia experiences in busy places, along with certain mobile use cases.

Sudatel Telecom Group (STG) and Etisalat's Emirates Data Clearing House (EDCH) Announced Soft Launch of Their A2P Messaging Initiative in Sudatel

STG's (Sudatel Telecom Group) ambition for this partnership is to maximize benefits for their subscribers and also take this market disrupting business model to their other operating countries too. The menace of routing international SMS as local by aggregators is real which has led to huge losses to MNOs as their network resources are utilized for free or at low charging rates whereas aggregators make huge profits. With EDCH's SMS Monetization solution this is checked and MNOs start generating visible incremental revenue. Mohammad El Fatih, Chief Commercial Officer of Sudatel said: "We wish to lead our markets by giving our subscribers a cutting-edge experience and ensure that their critical messages from banks and other vital services are delivered on time every time. So we believe through this partnership solution we can identify grey routes, monetize every message that is terminated in our network giving us competitive advantage and regulatory compliance. We also wish to negate spam being sent to our subscribers from illegitimate sources which impacts customer-experience" "We believe our partnership with EDCH for messaging protection is based on the trusted relationship we already cherish in International roaming clearing. There is no conflict of interest too as all other A2P providers do aggregation and demand exclusivity" "Nasser Salim, General Manager of EDCH, said: "STG and EDCH aspire to take this partnership in A2P messaging to further heights in creating a unique model for that region. We believe that our optimized and bespoke solution which is already disrupting the messaging industry is offering complete transparency in operations, billing and reporting. Another advantage is that we do not demand exclusivity and neither do aggregation creating the no-conflict of interest with Mobile operators.

VIVA Successfully Launches 5G Connectivity for Enterprise

VIVA, a world-class digital leader providing innovative services and platforms to customers and enabling the digital transformation in Kuwait, and a subsidiary of STC Group, announced the successful launch of the first "5G Connectivity" services in the Middle East for Enterprises across Kuwait. After leading the 5G network commercialization and nation-wide coverage in the Kuwait, VIVA has been focusing on providing the latest and best business solutions based on 5G technology to enable national ICT Transformation across the country. The initiatives aim at tackling the challenges to access fast and flexible deployment, high reliability and low latency connectivity for enterprises in the Kuwaiti market. By leveraging VIVA's leading infrastructure, "5G Connectivity" services will open a new era for Enterprise connection and ICT solutions in Kuwait. The "5G Connectivity" includes a series of products, such as "Dedicated Data Access", "Dedicated Internet Access", and on demand services like CCTV, Cloud PBX, which allows enterprises to have access to P2P and robust Internet with best experience and guaranteed bandwidth, that compliments fiber connectivity. Eng. Maziad bin Naser Al-Harbi, VIVA's CEO stated: "We are proud to launch "5G Connectivity" which is a service that enables enterprises to focus on growth of their business rather than worrying about connectivity. Thanks to our strong and leading 5G stance in the market, "5G Connectivity" will facilitate enterprise lease lines deployment and daily maintenance while ensuring an uninterrupted and enhanced experience. It will also provide the agile and scalable connectivity according to the enterprises' needs and requirements. In the 5G era, the Dedicated Access will be a typical application scenario. I believe the services will promote the commercial and social value of 5G. In the future, we will continue to enhance our portfolios so that to enable state-of-art ICT solutions for local enterprises, hence we were eager to participate at GITEX Technology Week to showcase our developed products and services." Ms. Anowd Muthaib, General Manager of Enterprise Marketing, represented VIVA at the 39th GITEX Technology Week held in Dubai, where she has showcased VIVA's significant growth in the B2B sector, focusing on innovative enterprise technology solutions and services that help both SMEs and large enterprises in developing their projects in line with the ICT Transformation process across the nation.

VIVA Reports KD 31.6 Million (US$ 104 Million) Net Profit during the Nine-Month Period Ending 30 September 2019

VIVA, a world-class digital leader providing innovative services and platforms to customers and enabling the digital transformation in Kuwait, and a subsidiary of STC Group, announced the financial results for the nine-month period ended 30 September 2019; whereby VIVA's Revenues reached KD 215.6 million, and the net profit reached KD 31.6 million for the nine-month period ended 30 September. Commenting on the financial results, Eng. Maziad Nasser Al Harbi, VIVA CEO said: "The company's financial results grew during the third quarter compared to the second quarter of this year, third quarter revenues reached KD 76.1 million compared to KD 72.9 million during second quarter of 2019, a growth of 4.3%, EBITDA grew by 11.0% reaching KD 21.4 million in the third quarter of 2019.while, the net profit for the same period increased to reach KD 11.7 million compared to KD 10.3 million for the second quarter of 2019, a growth of 13.3%. VIVA was able to achieve this growth during the third quarter of 2019 despite the continued competition witnessed in the Kuwaiti telecom market which is one of the most competitive markets in the region, where VIVA was able to achieve outstanding levels of revenues in addition to enhancing the operational efficiency to ensure generating value and positive return to our shareholders. VIVA has accomplished these results due to the implementation of the digital transformation strategy and providing integrated solutions for both consumers and enterprises, and has driven its business to new areas of sustainable growth, through a series of innovative initiatives which aims to improve operational efficiency, customer service, and offering the best services and products that cater to its customer's needs, as well as invested in the advanced 5G framework with the biggest scope over the country." `Al Harbi added: "Commenting on the results of the nine-months period ended 30 September 2019, VIVA managed to achieve revenues KD 215.6 million during the nine-month period of 2019, while the EBITDA recorded a growth of 11.3% to reach a KD 59.5 million during the nine-month period of 2019 compared to KD 53.4 million for the same period in 2018. EBITDA margin reached 28% during the nine-month period of 2019 compared to 25% during the nine-month period of 2018. As a result, VIVA reported a net profit of KD 31.6 million (earnings per share of 63 fils) during the nine-month period of 2019 with a profit margin of 15%. VIVA's customer base reached 2.01 million at the end of September 2019." He added: "VIVA managed to achieve positive earnings for its shareholders as a result of the commitment to elevate the quality of customer

service and improving the operational efficiency. By achieving this outstanding level of revenues and profitability during the nine-month period in 2019, VIVA reflects its solid stance in the telecom market, accompanied with the fruitful launch of the fifth generation (5G) network nationwide, positioning itself to be one of the first telecommunications companies in the region to offer this service to its customers with the widest coverage in Kuwait, and in line with companies of its likes in the international market." Al Harbi concluded: "VIVA's financial results reflected its capability to compete and preserve its function as the Second greatest telecom operator in the Kuwaiti market in terms of market share of revenue in the telecom sector. Due to VIVA's safe and stable financial policy, we continued to implement the cost reduction program adopted by the company during the previous year to reach the best results to enhance profitability by adopting a balanced and effective financial policy in operating and capital expenditures. Shedding the light on the financial position of the company as of 30 September 2019, the total assets at the end of the nine-month period of 2019 reached KD 387.8 million where total shareholders' equity reached KD 203.6 million, with a book value per share of 408 Kuwaiti fils. In addition, VIVA has a strong financial solvency position, which is considered one of the best companies across the Middle East telecoms companies."

Viva Kuwait Launches Enterprise '5G Connectivity' Service

Viva Kuwait this week launched 5G solutions for enterprises under the '5G Connectivity' banner, following its commercial launch of 5G smartphone packages in late July. In a press release claiming 'nationwide' coverage, Viva said its 5G Connectivity solutions include Dedicated Data Access, Dedicated Internet Access, and on-demand services su9ch as CCTV and Cloud PBX. CEO Maziad bin Naser Al-Harbi declared: '5G Connectivity will facilitate enterprise leased lines deployment and daily maintenance while ensuring an uninterrupted and enhanced experience. It will also provide the agile and scalable connectivity according to the enterprises' needs and requirements. In the 5G era, the Dedicated Access will be a typical application scenario. I believe the services will promote the commercial and social value of 5G. In the future, we will continue to enhance our portfolios to enable state-of-art ICT solutions for local enterprises.'

Zain Group in Collaboration with Broadband Commission for Sustainable Development Publishes Report on Child Online Safety

The Co-Chairs of the Broadband Commission Working Group on Child Online Safety, Zain Group and the World Childhood Foundation USA (Childhood) announced the publication of a new report on Child Online Safety: Minimizing the Risk of Violence, Abuse and Exploitation Online. The report is a collective effort and draws upon the expertise of the Broadband Commissioners and experts from around the world. The report was presented at a high-level meeting at the UN, "Children & the Digital World: Threats and Opportunities". Her Majesty Queen Silvia of Sweden, Founder of Childhood attended and delivered a keynote address. Broadband connectivity brings many benefits to children, including access to education and entertainment, it also has a dark side to it as it exposes children to major risks and threats online as well as different forms of violence and exploitation, such as child sexual exploitation and abuse, bullying and radicalization, among other critical vulnerabilities. The new Child Online Safety report gathers the available evidence on the scale and nature of the risks and harms children face online and provides actionable recommendations for how to prioritize children's online safety. The report was developed under the leadership of Dr. Joanna Rubinstein, President & CEO of Childhood USA, and Zain Group CEO of Operations, Scott Gegenheimer who co-chair the working group. A key point made in the report is that we need to prioritize child online safety, especially in anticipation of the expansion of the broadband in the developing world where most children live today. All the stakeholders, governments, regulators, operators, Internet service provider, NGOs and civil society and academia have to join forces in implementing common strategies to make the Internet safer for children in order to help prepare future generations to thrive in the digital space. These steps include incorporating measures addressing child online protection in the national broadband plans, ensuring that applications and services are age-appropriate and save per design, and that we deploy technology-driven solutions to improve child online safety. Commenting on the publication of the report, Dr. Joanna Rubinstein commented, "Millions of children are online every day using digital devices. They benefit from getting access to information, education and entertainment. However, they are also exposed to abuse and exploitation including sexual abuse, bullying and even radicalization. It is our duty to prevent this from happening and requires collective action. This report demonstrates the necessity of taking action now and sheds light on how we can take practical steps to address the UN's Sustainable Development Goal 16.2 calling on ending all forms of violence against children by 2030." The Sustainable Development Goals (SDGs) adopted in 2015 and the UN Convention on the Rights of the Child – which this year celebrates its 30th anniversary – represent the global commitment to a better future for all, especially to children. In 2018, the Broadband Commission for Sustainable Development established the Working Group for Child Online Safety with the primary objective to raise awareness of the online risks and threats to children. "There is a clear and urgent global need to work together to ensure that connectivity embellishes our children's experience of the world, rather than impairs it," said Doreen Bogdan-Martin, Director, Telecommunication Development Bureau, ITU." Today's new report and Declaration by the Broadband Commission Working Group on Child Online Safety are welcome and valuable contributions to the global store of best practice, as well as serving as important new inputs to ITU's Child Online Protection framework." Scott Gegenheimer said, "Child Online Safety is a topic that is of great importance for Zain and we are committed to playing our key role in addressing this on a global level. Our region has conflicts and challenges that are quite unique compared to other places in the world as well as the highest share of youth in the world, coupled with a rising broadband connectivity rate. It is imperative for organizations which are based in the region, to be at the forefront of the effort to protect the most vulnerable victims both in the physical world as well as in cyberspace." Zain continues to champion the cause of child rights and protection given that challenges in tackling the dark side of connectivity are mounting. The report aims to raise the prioritization of child online safety among all key stakeholders and decision makers including

in governments, the private sector, civil society, non-governmental organizations, and academia. Zain has been bold and unapologetic in shedding light on topics related to child abuse and the need to stamp it out, which can sometimes be considered a taboo topic in region. The Internet has already transformed our lives at an unprecedented pace and scale. For children in developed countries, the digital world is the one they are born into and live within every single day. The Internet and its associated technologies are completely integrated into the way they live their lives across a very broad spectrum of activities. Governments, academia, civil society and the private sector must invest in and accelerate the development of scalable solutions to address abuse and exploitation of children online. Achieving the SDGs for children by 2030 requires innovation and collective action. Broadband connectivity is a key enabler for children's future, as it ensures that all children have an equal opportunity to thrive, so that no child is left behind. It also plays a critical role as an enabling component as well as helping fuel the achievement of all the Sustainable Development Goals.

Zain Launches the Region's Largest 5G Network

Zain Group announces that its operation in Saudi Arabia has launched 5G commercial services, with the first phase of the rollout being implemented through a network of 2,000 towers that cover an area of more than 20 cities in the Kingdom. This launch follows the launch of 5G services in Kuwait and is the largest 5G network deployment in the region to date. It will be followed by a gradual expansion of the network to cover a total of 26 Saudi cities utilizing 2,600 towers by the end of 2019. 5G is regarded as a major global breakthrough in the field of digital technology, and its implementation in Saudi Arabia is expected to contribute towards realizing the digital transformation goals specified in the Saudi Vision 2030. Zain KSA's launch of 5G services will speed up the roll-out of this advanced technology and its applications, offering high-speed mobile internet connectivity to users across the Kingdom. Commenting on this significant milestone, Zain Vice Chairman & Group CEO, & Zain KSA Vice Chairman, Bader Al Kharafi said, "5G will bring substantial change for the Kingdom's telecom industry, creating new business models and unlocking opportunities for many sectors such as financial, ICT, agricultural, tourism, entertainment, automotive, health, education and public sectors, to name a few. The technology is also expected to contribute significantly to the country's economy, creating thousands of new jobs." He continued, "Zain KSA will continue to enhance its services and launch innovative offerings that guarantee satisfaction for its 8.3 million customers. We are keen to offer 5G services to all business and individual clients through various service packages at competitive rates." Al Kharafi concluded, "We remain committed to invest further in infrastructure and develop our services to be on par with global digital technology advancements and offer remarkable new services to support the 5G network's capabilities and coverage." The 5G service will provide prepaid and post-paid customers with high-speed internet connectivity 10 times faster than the current 4G network. It will also allow customers to utilize advanced digital solutions and technologies, including virtual and augmented reality, Automated System Operations, 3D printing, and robotics, in addition to enabling them to enjoy their preferred entertainment content and video games with ease. 5G services will provide a great research opportunity for students and professionals in the artificial intelligence and virtual reality disciplines, as well as opening up new fronts for advancing various Big Data services in the Kingdom including IoT and smart services such as self-driving vehicles and smart city grids. Additionally, issuing electronic visas and other similar Fourth Industrial Revolution technologies including IoT and digital payments will be accessible through the upgraded network. Zain KSA is eager to support the Kingdom's mega government initiatives and projects that are the result of an ambitious Saudi vision to position the Kingdom as a digital and innovation pioneer. In this context, Zain KSA has recently inaugurated its 5G network at the Neom Bay Airport, an area regarded as Saudi Arabia's futuristic gateway. The telecom provider also showcased some impressive technologies the 5G network will enable during the inauguration ceremony of the Kingdom's new "welcome the world" tourist visa. Zain KSA benefits greatly from the expertise of its parent company Zain Group, one of the most innovative telecom companies in the region. The Group supports Zain KSA to be a leader in the sector and drive technology innovation in the Kingdom forward.

Zain Kuwait Launches VSaaS Solutions for Enterprise Customers

Zain, the leading digital service provider in Kuwait, announced the launch of Video Surveillance as a Service (VSaaS) solutions for enterprise customers. The integrated VSaaS platform features a wide range of services on Zain's secure cloud, and gives customers the convenience of easily accessing and managing their recordings anytime and anywhere. The announcement comes as part of the company's commitment to offer the latest and most advanced security solutions to the Kuwaiti business sector, both large businesses and small/medium-sized enterprises, and as per the highest international standards. This also comes in line with Zain's digital transformation strategy that aims at empowering a more efficient business sector in the Kuwaiti market. Zain's integrated VSaaS platform features a wide range of cloud-based services, including video recording, storage, remote viewing, management alerts, cybersecurity, and more. Video processing and management are securely performed offsite through Zain's cloud in Kuwait, which customers can directly connect onsite cameras to. Customers can also access and manage their recordings easily anytime and anywhere from any smartphone, tablet, or computer. Zain offers these services and more through a number of flexible plans that suit corporate customers' various needs and as per the enterprise's size and number of desired sites. The plans feature high-quality cameras - designed for both indoor and outdoor use - from world top brands like Avigilon and Dahua, and can be connected through Wi-Fi or Zain's 4G LTE network as needed. Zain's VSaaS solutions use equipment and systems from world tech leader Huawei, and are managed by Zain Group's smart city arm NXN, who also provides analytics for different sectors like oil & gas and others. Zain recently showcased its VSaaS solutions during its participation – for the second time running - in the fourth Kuwait Oil and Gas Show and Conference (KOGS 2019) under the patronage of H.H. the Prime Minister Sheikh Jaber Mubarak Al Hamad Al Sabah. Zain took the opportunity to provide high-speed Wi-Fi to cover all parts of the exhibition, and the company showcased many of its Zain Business services and solutions for corporate customers attending the exhibition, particularly those presented to the oil & gas industries. Zain's strategy is centered on digital transformation leadership and empowering the community to enjoy a smarter portable lifestyle, as well as using advanced technology to enable an easier and more flexible life. The company places itself as an active partner in creating the future of smart life in Kuwait. Today's launch will contribute to prove the company's full potential in triggering the digital community, and will enrich its collaborations in Telecom and IT areas with its strategic partners on multiple levels.

Zain Partners with Microsoft to Drive Digital Transformation in Kuwait

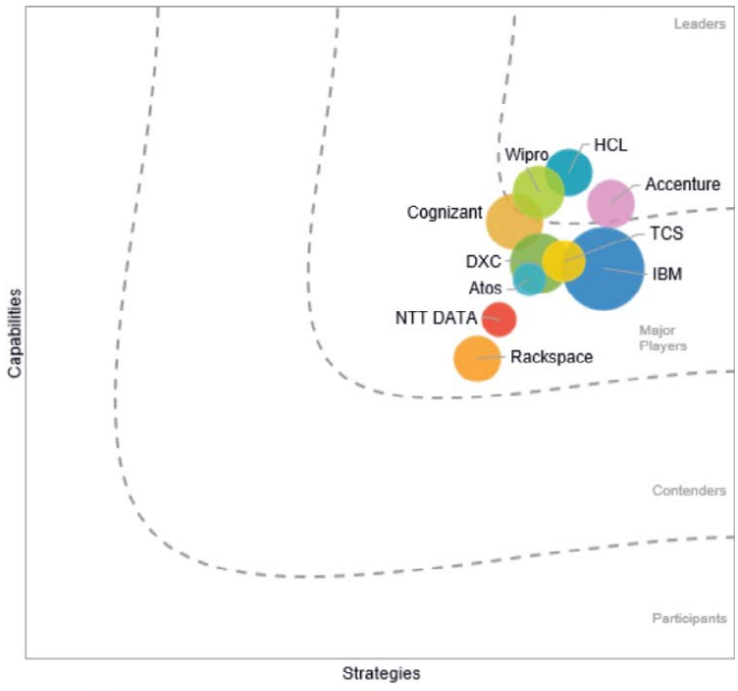
Zain, the digital service provider in Kuwait, has announced a partnership with Microsoft to accelerate digital transformation among its SME customers, through the provision of trusted cloud services. The partnership will allow existing Zain customers to benefit from launch offers and special promotions while connecting Kuwait's entrepreneurial community to the advanced tools and technology platforms needed to grow and thrive in the global digital economy. Small and medium-sized enterprises (SMEs) will gain access to solutions such as Office 365 and other Business Intelligence tools in order better empower their employees, engage their customers, optimize operations and transform products and services. Eaman Al Roudhan, Zain Kuwait's chief executive officer, commented: "Our collaboration with Microsoft comes under the umbrella of Zain's vision to expand our strategic partnerships ecosystem with global technology leaders around the world to offer the latest and most advanced business solutions to the Kuwaiti entrepreneurial community. It is of paramount importance to us that we support homegrown talents in their endeavors to create jobs and make their mark on the regional and global stages. "Recently, Kuwait has sought to expand its SME sectors to support national economic-diversification programmes," said Charles Nahas, regional general manager, Middle East Cluster (MEC) Microsoft. "Microsoft remains committed to helping Kuwaiti SMEs achieve more through the power of digital transformation. As the result of our partnership with Zain, the trusted Microsoft Cloud will help these businesses engage customers, empower employees, optimize operations and reinvent products and services." Zain's Microsoft Office 365 bundle will consist of several subscription-based options that include Office 365 and Microsoft Exchange Online, both which offer increased productivity, efficiency and reduced costs, both on-premise and on-cloud. Businesses of all sizes can enjoy access to their productivity applications anywhere and at any time with all the necessary upgrades at no cost. Customers will also have access to a variety of complementary services, including 24/7 support and consultancy from Zain and Microsoft's teams. A number of additional services are also available for customers to ensure they get the best out of their service experience, such as on-boarding and migration as well as mobility bundles, including the all-new revolutionary 5G technology. Zain signed a partnership agreement with Microsoft in October 2018 to offer various cloud-based services to large enterprises and small-medium businesses across Kuwait.

Accenture to Acquire Nytec to Innovate Connected Experiences for Clients

Accenture has entered into an agreement to acquire Nytec Inc., an award-winning product innovation and engineering company. Founded in 1975, Nytec is headquartered in Kirkland, WA, and has a team of 250 professionals. Nytec will become part of Accenture Industry X.0, which offers capabilities that drive the digital reinvention of industry. This includes creating new types of products, services and experiences, and better ways to design, engineer, manufacture, operate and support them across their entire lifecycle. Nytec will expand Accenture Industry X.0's ability to innovate connected, Internet-of-Things (IoT)-enabled experiences for clients from idea through to realization — an area in which both Accenture and Nytec have already demonstrated success. Nytec is Select Innovation Partner for IoT Equipment Design and Engineering for Carnival Corporation's Ocean Medallion™ guest experience transformation, while Accenture has been named Premier Innovation Partner for Carnival Corporation's Global Experience and Innovation Team. Nytec will add deep expertise in software platform development and engineering to Accenture Industry X.0 that is required to build the underlying IoT infrastructure and systems for connected experiences, particularly for clients in the consumer tech, industrial high tech, hospitality, travel, and consumer goods and services industries. Nytec operates an end-to-end LEED Platinum certified Product Innovation Center (PIC) in Kirkland, WA where it offers design, prototype development, engineering and support services for manufacturing. Accenture is planning to expand the PIC and bring it into its network of Forges, which is part of its global Industry X.0 Innovation Network of more than 20 facilities. The network combines startup thinking with rapid prototyping, delivery and ramp-up capabilities to co-develop new products and services with clients and bring them to market quickly. "Our ambition is to become a key partner for clients wanting to transform their business through innovation that is coming from the fusion of software, physical products and connectivity," said Craig McNeil, Accenture Industry X.0 lead, North America. "We've been building the skillset to deliver on this ambition, in part through our acquisitions of hardware engineering company Mindtribe and embedded software development firm Pillar Technology, and with Nytec we will continue to expand it." "Our designers, engineers, and manufacturing experts translate complex problems into compelling, simple solutions that deliver the ultimate user experience," said Rich Lerz, CEO of Nytec. "Becoming part of Accenture Industry X.0 will allow our team to scale services for our clients and get access to the best brands in the world." Other acquisitions that have strengthened Accenture Industry X.0 include product design and innovation firm Altitude in Boston, strategic design consultancy design affairs, and technology consultancy Zielpuls, both in Munich, Germany. The transaction is subject to customary closing conditions. Financial terms were not disclosed.

Accenture Recognized as Leader in inaugural IDC MarketScape Report for Worldwide Managed Cloud Services

Accenture has been positioned as a Leader in the first ever IDC MarketScape: Worldwide Managed Cloud Services 2019 Vendor Assessment. In the report, which evaluates 10 service providers across the full spectrum of clouds and IT applications and infrastructure for managed public, private, and hybrid cloud services, Accenture was named a Leader. "Managed cloud services are becoming a primary means of enterprises getting critical support by third-party managed SPs to help them manage their cloud environments," said David Tapper, vice president of Outsourcing and Managed Cloud Services at IDC. "The breadth of its investment along with its strong consulting and migration capabilities make Accenture a good partner for any business looking to exploit the opportunities inherent in the cloud." Looking at Accenture's main strengths, the IDC MarketScape noted the company's high utilization rates of Platform-as-a-Service delivery, investments in centers of excellence, strong financial growth performance, high client retention, high service availability, fast response times rates, and robust recovery services. The IDC MarketScape also noted that "Accenture's growth rate in the managed cloud services surpassed market standards." Finally, Accenture was rated highly for "application capabilities



Source: IDC, 2019

in supporting SAP, Oracle, and Microsoft, along with systems infrastructure software that are deployed on public clouds." The strength of Accenture's offering was underlined by highly positive client feedback sourced by IDC during the writing of the report. According to the IDC MarketScape, "Client feedback reflects an overall high satisfaction rating, with strength in providing technology expertise, possessing industry and/or business process knowledge, and delivering a full array of security and recovery capabilities." Kishore Durg, Senior Managing Director and Accenture Cloud lead, commented: "Businesses are increasingly looking to managed cloud services for business transformation. Accenture's approach is to apply the innovation usually seen in public cloud to hybrid alternatives, helping businesses with powerful automation, self-service and microservice capabilities. It's about staying focused on business outcomes to make an impact within their organizations. The IDC MarketScape shows that we are on the right track, and we look forward to building on this strong leadership position." In the IDC Managed CloudView 2018: Executive Summary, which involved 1,500 respondents across six countries, used to complement this competitive analysis, Accenture received a higher rating against rivals in which respondents indicated that they would recommend Accenture to a friend or colleague.

Accenture Enables Network Operators to Implement 5G and Fiber Strategies with Launch of New Cloud-Based Network Decision Platform

Accenture has launched its Network Decision Platform, a cloud-based solution that provides communications network operators with an integrated, end-to-end view of fifth-generation (5G), fiber and traditional mobile communications services. Leveraging big data, analytics and artificial intelligence (AI), the platform is designed to help mobile, cable and wireline operators prioritize and calibrate network investment, planning, deployment, customer acquisition, migration and intelligent service support. The data from the Network Decision Platform provides network operators with a variety of insights, such as how to optimally deploy their network assets to offer a compelling 5G service. Wireline and cable operators can also leverage the platform to identify where to expand their fiber networks as a source for growth, and how best to compete with emerging 5G services. "A new wave of network investment is upon us, as the race to 5G intensifies and network providers seek to evolve their footprint," said Tejas Rao, managing director and global 5G lead for Accenture's network practice. "Employing data analytics and visualization tools, our Network Decision Platform helps operators identify where to deploy capital efficiently, accelerate deployment timelines and calibrate their business case metrics. When combined with operational data, this can provide operators with a 360-degree view of their return on investment, deployment and operations." The scalable platform takes advantage of access to a wealth of third-party data, public data, AI and machine learning to drive efficient and accurate decision-making and to automate parts of the deployment processes. Offered as a managed service or other flexible solutions based on individual operator needs, the Network Decision Platform enables clients to maintain a limited cost of ownership and to achieve results – for example, where to deploy and how to monetize the networks - in as little as six to eight weeks.

AT&T, Verizon Join CBA in Backing C-Band Auction Principles

The C-Band Alliance said it's now able to increase the amount of spectrum from 180 MHz to 280 MHz, with a 20 MHz guard band. While some lawmakers are turning up the pressure to force the Federal Communications Commission (FCC) to conduct a public auction of C-band spectrum, the C-Band Alliance (CBA) announced that it is being joined by several entities on a set of principles designed to guide a CBA-led auction of the airwaves. Verizon, AT&T, Bluegrass Cellular, Pine Belt Wireless and U.S. Cellular joined the CBA in an FCC filing that details a set of principles to guide a process of auctioning off terrestrial rights to the spectrum. Verizon and AT&T previously signaled their support for a CBA plan in prior FCC filings. Notably absent from the list is T-Mobile, which has been arguing for a public auction. Indeed, T-Mobile CTO Neville Ray met with FCC commissioners last week to discuss the C-band, and noted support in the record for transitioning many of the existing users to fiber. But the support of the wireless carriers is just one development. The CBA on Monday also announced that it's increasing the amount of spectrum it's proposing to release from 180 MHz to 280 MHz, with a 20 MHz guard band retained for the protection of ongoing satellite operations. It's able to do that after working with customers to ensure enough C-band spectrum remains for content distribution. The CBA further explained that the increase in the amount of spectrum to be cleared for 5G is made possible by technologies such as advanced modulation, single format transport and advanced video compression, including High Efficiency Video Coding (HEVC). These technologies improve the efficiency of satellite video delivery, allowing the same content to be transmitted over less spectrum. Specifically, the CBA is proposing to clear a first tranche of 120 MHz of spectrum, inclusive of a 20 MHz guard band, in 46 metro zones within 18 months of an FCC order. A second tranche of spectrum would be made available within 36 months of the C-band auction. The auction principles that the wireless operators and satellite companies are proposing suggest the use of a multi-round ascending clock auction format that is “substantively similar” to other recent FCC auctions, according to the CBA. The principles call for a single auction that would include all proposed cleared spectrum, divided into 20 MHz blocks based on partial economic areas, regardless of timing or tranche. Other principles detailed in the filing include the setting of an aggregate reserve price and the agreement for participants to be bound by the FCC's communications rules, reporting obligations and enforcement. However, because the satellite companies in the C-Band Alliance are headquartered outside the U.S., lawmakers are crying foul and saying the U.S., if it proceeds with a CBA-led auction, will be relinquishing billions of dollars to foreign companies instead of funneling it to U.S. coffers. They also say that an auction that is not conducted by the FCC will be challenged in court, causing further delays in getting the spectrum into the hands of wireless carriers. Last week, a group of lawmakers introduced the C-BAND Act, which would require the FCC to conduct a public auction of the C-band. The Senate Subcommittee on Communications and Technology of the Committee on Energy and Commerce held a hearing today on the C-band auction process. Witnesses included Public Knowledge, Citizens Against Government Waste and other groups lobbying for an FCC-led auction. In light of that hearing, the American Consumer Institute, R Street Institute and others submitted a letter to the committee asking them to support the CBA plan for private auctions in the secondary market. They argued that U.S. tax revenues will diminish if the C-band is not rapidly brought to market and that the CBA repeatedly pledged to make a significant contribution to the U.S. Treasury from auction proceeds. Earlier this month, FCC Chairman Ajit Pai said he had not yet made up his mind about how the FCC will handle the C-band, but that he was still optimistic an item will land on the FCC's agenda before the end of the year.

AT&T, Axtel, Telmex Renew 3.5GHz Rights, Report Says

As Mexico prepares for the 5G era, three domestic players have reportedly renewed legacy spectrum rights covering the 5G-suitable 3.5GHz band. According to El Economista, the Federal Telecommunications Institute (Instituto Federal de Telecomunicaciones, IFT) has permitted AT&T Mexico, Axtel and Telmex to renew longstanding 50MHz nationwide WiMAX concessions, each of which will run for 20 years, starting on 1 January 2020. All three players are required to relinquish parts of their current 3.4GHz frequency allocation by year-end, however, to ensure a fairer spectrum distribution. As per the report, Axtel will now operate spectrum in the 3500MHz-3550MHz range and will relinquish frequencies in the 3425MHz-3450MHz and 3525MHz-3550MHz bands. Meanwhile, Telmex has transferred 3550MHz-3575MHz spectrum to AT&T, in exchange for 3475MHz-3500MHz frequencies. TeleGeography notes that an additional 50MHz of spectrum within the 3.4GHz-3.6GHz range is expected to come into play next year, most likely via an IFT auction.

AT&T Sells 1,000 Towers to Peppertree for USD680m; Offloads CME Assets to PPF

AT&T Inc. has agreed to a sale-leaseback of its remaining domestic company-owned wireless towers to Peppertree Capital Management. Under the terms of the sale, which is valued at up to USD680 million, Peppertree will purchase more than 1,000 AT&T towers, and AT&T will lease back capacity on the towers from Peppertree. The sale is consistent with AT&T's plans to monetize non-strategic assets as it continues to pay down debt. The transaction is subject to certain closing conditions, including due diligence. AT&T expects to close a substantial number of the towers by the end of the year. In a second notable strategic divestment, AT&T has agreed to sell Central European Media Enterprises (CME) to an affiliate of Petr Kellner's PPF Group in a cash transaction valued at approximately USD2.1 billion. CME is a media and entertainment company operating leading businesses in five Central and Eastern European markets – Bulgaria, Czechia, Romania, Slovakia and Slovenia – with an aggregate population of approximately 45 million people. AT&T inherited the stake in CME when it acquired Time Warner in June 2018.

AT&T to Sell Puerto Rico, USVI Operations to Liberty Latin America for USD1.95Bn

Liberty Latin America (LLA) has entered into a definitive agreement to acquire AT&T Inc.'s wireless and wireline operations in Puerto Rico and the US Virgin Islands in an all-cash transaction with an enterprise value of USD1.95 billion. The transaction includes network assets, including spectrum; real estate and leases; customers, including 1.1 million wireless subscribers; and contracts. At close, approximately 1,300 current AT&T employees will move to LLA. In Puerto Rico, which represents approximately 90% of the revenue of the assets to be acquired, AT&T is the leading provider of mobile services and also operates a fiber backhaul network. Under terms of the agreement, AT&T will retain responsibilities for the FirstNet first responder program as well as continuing to serve DirecTV pay-TV customers and preserving 'certain global business customer relationships'. Further, AT&T has agreed to support LLA for a period up to 36 months following the acquisition, enabling the efficient transition of services. Following the acquisition, customers will continue to benefit from free roaming services between Puerto Rico, the US Virgin Islands, mainland US, Mexico and Canada. The transaction is subject to customary closing conditions, including reviews by the US Federal Communications Commission (FCC) and the Department of Justice (DoJ). The parties expect the transaction to close in Q2 2020. TeleGeography notes that this deal represents LLA's third notable takeover since its 'split-off' from UK-based Liberty Global plc in December 2017. In February 2018 it agreed to purchase an 80% stake in Costa Rica's Cabletica for USD245.7 million and in March 2019 LLA agreed to acquire an 87.5% controlling stake in Curacao-based United Telecommunication Services (UTS) for USD165.4 million, going on to secure the remainder of the company in September 2019.

AT&T Awards Developers and Creators at 5G Experience Hackathon

More than 200 developers, designers and creators descended upon Los Angeles this past weekend to build and test mobile solutions using the high bandwidth and low latency of AT&T's 5G+ network, which reached speeds up to 1.8 Gb per second onsite. In one of the first 5G hackathons in the industry, participants on over 40 teams came together to highlight the potential of 5G to disrupt the way we experience, consume and create content, all while competing for $100,000 in cash prizes. This hackathon is an important milestone as we develop compelling 5G use cases ahead of making the network available to consumers later this year. All submissions were conducted on a Samsung Galaxy S10 5G, initially made available to select AT&T businesses and developers this past summer, using the onsite 5G network.

AT&T Latin America Named Among the World's Top 25 Best Workplaces

Great Place to Work®, the global people analytics and consulting firm, has named AT&T Latin America among the 25 World's Best Workplaces. The company ranked 25 on the 2019 World's Best Workplaces list making it the highest ranked wireless and digital entertainment services company. This is the first time that AT&T Latin America and its subsidiary companies AT&T Mexico and Vrio, the holding company for DIRECTV Latin America and SKY Brasil, are honored as one of the World's Best Workplaces. "This recognition is a testament to the work our teams have done across AT&T Latin America to embody our AT&T values by pursuing excellence, standing for equality, inspiring imagination and consistently making a difference in our world. In doing so, I'm proud that our employees have given us top marks, enabling AT&T Latin America to be named one of the World's Best Workplaces," said Lori Lee, CEO AT&T Latin America. "As a leader, there is no greater honor than to know that our team feels trusted, respected and empowered to do their best work every day." Great Place to Work® surveyed more than 12 million employees across 8,000 companies worldwide. Following a review of over 50 statements of employees' individual job experience, AT&T Mexico and DIRECTV Latin America subsidiaries in Argentina, Chile, Colombia, Ecuador, Peru and Uruguay were each identified as one of the best companies to work for in their respective countries. Employees highlight the company's strong commitment to diversity and inclusion and corporate social responsibility as key factors that make their experience with the company great. People cite as strengths that they are treated fairly, regardless of race, gender and sexual orientation. They also feel they can be themselves at work and make a real difference in their communities. In addition to being named a World's Best Workplace, AT&T Latin America and its subsidiary companies have earned a range of other special recognitions for the company's strong workplace culture from Great Place to Work®, including:

AT&T Latin America has been recognized as a Best Multinational Workplace in Latin America.

AT&T Mexico was honored as the #1 company in country among Millennials, #2 in Telecom and IT and #2 for Diversity & Inclusion.

BT Launches 5G Services for Consumer, Business Customers

BT has launched 5G mobile services for consumers and businesses. The services are initially available in more than 20 towns and cities across the UK using the EE network, with plans to expand coverage to an additional 25 locations by end-2019. BT is offering BT Plus and BT Business customers exclusive priority to take up the 5G service from launch, with the new 5G smartphone plans offering the latest handsets from brands including Samsung, Huawei, OnePlus and Oppo. BT Plus customers can choose from four new 5G plans, each offering double data. They can choose a 12GB, 30GB, 60GB or 200GB plan, starting from GBP 45 per month. All the 5G plans benefit from inclusive BT Sport app access. BT Business customers have the option of a 6GB, 30GB or 60GB 5G mobile plan, with a GBP 10 discount on their handset or SIM-only plans when they order together with BT Business Broadband. The BT Business Mobile 5G plans start from GBP 35 per month for a handset plan, or GBP 15 per month for a SIM-only plan and include unlimited calls/texts, plus unlimited access to BT's 5.5 million Wi-Fi hotspots.

BT Brings 5G Future to Belfast Harbor with "Live" Demonstrations of Augmented and Virtual Reality

Belfast Harbor, BT and mixed reality partners Ubimax and VRtuoso showcased the tangible benefits that 5G can deliver to business and industry across the UK. In a first for the UK, the demonstrations, performed "live" over BT's public 5G network, show two 5G enabled applications that are being explored by Belfast Harbor as part of their vision for creating a "Smart Port" and an iconic waterfront for the City. The first demonstration shows a member of Belfast Harbor's operations team wearing an augmented reality headset connected to a 5G device. They'll be seen inspecting one of the Harbor's cranes and receiving step-by-step maintenance guidance and remote support through video collaboration with a remote expert, via an application server in the cloud. 5G provides the ultrafast speeds and reliability needed, while augmented reality solution specialists Ubimax provide the software for the headsets. These computing devices can easily be worn by any operational staff working out in the Port. The demonstration shows how maintenance activities can be simplified and improved, by delivering information directly to staff when and where they need it. The hands-free headsets are particularly suitable in hazardous environments, where health and safety is essential, and built to work with personal protective equipment such as hard hats. EE, part of BT Group, was the first operator to launch a 5G network in the UK, with Belfast one of six cities chosen for phase one of the roll out. The potential industry and business benefits of 5G enabled applications like this are vast, from improved operational efficiency and productivity, to fast and reliable knowledge transfer and higher employee satisfaction and engagement. The second demonstration shows a 5G immersive experience, illustrating how 5G can make virtual reality "boundary-less" by allowing geographically dispersed participants to draw virtual reality content down from the cloud. Participants can then be connected into the same real-time, virtual presentation or training event. Content creation and event sessions are managed using the simple to use VR solution from VRtuoso. Only 5G can provide the connectivity needed for the content download and real time event interaction. Immersive experiences have the potential to transform marketing and training activities. They enable companies like Belfast Harbour, with large fixed infrastructures, to take the Harbour to the customer, letting them experience the environment and services in a much more captivating and immediate way. They can also be a powerful training tool - an immersive 360-degree experience makes the brain feel like the user has experienced a situation, creating a memory that leads to higher levels of engagement and retention. Gerry McQuade, CEO of BT's Enterprise unit, said: "We're delighted to be working with Belfast Harbor, Ubimax and VRtuoso to explore the benefits that 5G can bring to the Port and to the City of Belfast. "Over the next 15 years, 5G technologies are expected to contribute 2.2 trillion dollars to the global economy. It will deliver far more than enhanced mobile broadband services for consumers and will have a far bigger impact in the enterprise space, by transforming entire industries. But 5G can't be viewed in isolation. It needs to be considered as a vital component of a brand-new digital ecosystem comprising the Internet of Things, data analytics, AI, mobile edge computing, content and cloud infrastructure. "The demonstrations we've shown today are a powerful illustration of what 5G can do for business, both here in Northern Ireland and across the UK. They've shown that 5G will be the catalyst for a revolution in how technology supports people, enables workplaces and simplifies operations." Joe O'Neill, Chief Executive of Belfast Harbor added: "Working with BT on this initiative has opened our eyes to a whole new world of 5G possibilities. We have a strong ambition and motivation to become the world's best regional port and create an iconic waterfront district for Belfast, making it an attractive place to live, work, visit and invest in. Using the very latest technologies and collaborating with expert partners is a key part of how we will deliver that vision for Belfast. What we've seen so far has given us a real appetite to continue exploring how 5G enabled applications will help us transform the Port and Belfast's waterfront, boost trade and make an even more significant contribution to Northern Ireland's economy."

BT Sparks Network Transformation for Rexel

BT has successfully completed the implementation of a new software defined wide area network (SD-WAN) for Rexel, a leading distributor of electrical products, connecting more than 50 sites throughout Germany. The agreement for provision and management of the network is the latest development in a relationship that spans more than 15 years. The new network, based on Meraki SD-WAN technology, will allow Rexel to combine the benefits of different network technologies to achieve the ideal balance between security, resilience, flexibility and cost. Mission-critical and sensitive data will be transferred using dedicated connectivity, based on BT's multiprotocol label switching (MPLS) network. Less critical traffic will be routed over the Internet. Using a self-service portal, the customer's ICT team will be able to choose which connection to use for each of its business applications, optimizing cost and service reliability. The management portal also provides better visibility of data flows across the network. Managed security services, including hardware and software-based firewalls, are an integral part of the new network design. The next step is to migrate the local area network (LAN) to Meraki technology as well, providing Rexel with end-to-end visibility and control of the entire network. The Rexel Group operates in 26 countries throughout Europe, the Americas and Asia-Pacific. As part of an ongoing plan to optimize its global network, the Group is planning to roll out SD-WAN technology to further countries. Wolfgang Tomischek, IT Director at Rexel in Germany, said: "Our customers place their orders via multiple channels — using the online shop, fax and phone — and expect us to deliver within hours. We have chosen BT because secure, reliable connectivity is key for our business, and we need a partner who can deliver the solution on a global scale, as we are part of an international group. The new, hybrid solution will give us more flexibility and control and help us control the cost at the same time." Joris van Oers, Managing Director, Resources, Manufacturing & Logistics and regional MD for Europe at BT, said: "We are proud to support Rexel with our SD-WAN solution, which offers simplicity to customers looking to capitalize on the latest network technology to support their digital transformation. It provides our customers with a better understanding of the demands on their network, and lets them control and priorities the data traffic. And it offers a plug-and-play approach to installing new sites backed by BT's expertise in design, set-up, implementation and network management." Connect Meraki SD-WAN is part of BT's wide-reaching Dynamic Network Services program, designed to give customers more choice, security, resilience, service and agility in the roll-out of future networks based on the latest software defined networking (SDN) and network functions virtualization (NFV) technologies.

BT Launches 5G Services, Plans in U.K.

BT launched 5G services across more than 20 towns and cities in the U.K., riding on BT-owned mobile operator EE's network. EE turned on commercial 5G services in Britain in May, and BT's service rollout includes existing EE 5G locations. 5G on BT Mobile is now available in parts of Belfast, Birmingham, Cardiff, Coventry, Edinburgh, Leicester, London, and Manchester, with plans to expand to additional cities by year-end. BT Mobile is initially offering 5G service to its BT Plus broadband customers, who subscribe to both home and mobile packages. Customers can choose from four data plans ranging from 13 GB to 200 GB, starting around $50 per month. Next month, the company is debuting a combined 5G mobile and home broadband unlimited plan called BT Halo, which customers on the current 200 GB plan will be moved over to. BT Mobile's 5G uses 3.4 GHz spectrum, and requires a compatible device. The mobile brand is offering a range of handsets including the Samsung Note 10 5G, Galaxy S10 5G, OnePlus 7 Pro, Huawei Mate 20 X 5G, and Oppo Reno 5G. The carrier said 5G service has the potential to hit peak gigabit speeds, but that customers should expect an average speed increase of about 150 Mbps. In addition to EE, rival Vodafone U.K .also launched its 5G network in Britain this summer, initially starting with seven major cities. Telefónica-owned British mobile operator O2 in late July said it would roll out 5G services in select areas of Belfast, Cardiff, Edinburgh, London, Slough, and Leeds in October, but an official launch as not yet happened. The operator said its network would hit 20 towns and cities by the end of 2019 and expand to 30 additional locations by next summer. To speed up and help reduce the cost of rolling out 5G, Vodafone and O2 inked an earlier network sharing agreement that it includes sharing 5G gear, such as radio equipment on joint sites across the U.K. Like EE, O2 is using spectrum in the 3.4 GHz band, which the operator won last year at the U.K'.s 5G spectrum auction for EUR 318 million ($354 million). U.K operator Three, meanwhile, has touted its millimeter wave spectrum assets, claiming it has twice as much 5G spectrum as its closest competitor. Three promised to rollout 5G fixed wireless home broadband services and mobile 5G across 25 markets this year.

BT Wins New Contract with Spanish Government to Connect Offices Around the World

BT announced it is expanding its relationship with Spain's Central Government to support its operations around the world by providing communications services in 120 countries. It follows the signing of a new, three-and-a-half-year agreement valued at €39.97 million under which BT will make the government's international network more powerful and increase the scope of current services it provides to end-users. BT will draw on its global reach and technical expertise to upgrade the Spanish Central Government's global network, which provides resilient connectivity for Spain's embassies, consulates and trade offices. It also includes satellite-based connections to ten scientific research ships in the Atlantic Ocean and the Mediterranean Sea as well as a Spanish polar research station in Antarctica. The upgraded network will enable deployment of advanced digital solutions, such as virtual desktops and web-based applications for end-users, including citizens and Foreign Office staff. With enhanced bandwidth, security and resilience, it will deliver more productive experiences for the users by making their IT applications and services easier to access, better performing and more reliable. BT was selected to support the international presence of the Spanish Government because of its global footprint, experience and the quality of its offer during the tender process. Joris van Oers, Managing Director, Europe Region, BT, said: "The power of BT's brand opens doors around the world. Governments trust us because we have proven industry leadership in delivering secure and reliable connectivity and support for their far-flung operations, ensuring their sensitive operations are protected and connected as well as fully future-proofed for the next wave of innovation in software-defined networking and delivery of digital services."

Cisco Strengthens Partnership with Telenor on 5G in Norway

Earlier this year, Telenor Group and Cisco signed an agreement whereby Cisco will help upgrade Telenor Norway's existing mobile core network to also deliver a first generation 5G network (non-standalone mode or NSA). The 5G NSA core network is designed to meet the needs of customers in the mass market, the B2B market, Internet of Things (IoT) and important critical services throughout 2020. It will deliver a significantly larger capacity than today's 4G network. 5G users will experience faster download speeds and a better overall user experience. The network's total capacity will allow the core network to neutralize expected traffic peaks (for major sporting events, as an example) without compromising the user experience. This helps to ensure HD quality for both 4G and 5G streaming. Since 2010, Cisco has provided core technology to Telenor Norway's 3G and 4G networks. The network is constantly being modernized to stay ahead of the market. In 2018, the companies upgraded Telenor Norway's core network to provide Scandinavia's first nationwide network for IoT. "Cisco has extensive experience in delivering core technology for mobile networks, and we are excited to continue our collaboration into the 5G era," said Ruza Sabanovic, chief technology officer, Telenor Group. "For several years we have made each other better through open and good technical dialogue and strategic cooperation, and we look forward to continuing that. Cisco is an important supplier and partner for us, and will play a key role in the development also of the Norwegian 5G network." "5G NSA is an important step on the road to a fully operational, standalone 5G network that will allow Telenor to enable real-time applications across verticals such as telemedicine, transportation and commercial/industrial, with low latency," said Jonathan Davidson, senior vice president and general manager, Service Provider Business, Cisco. "Our long-standing partnership validates our unique ability to provide innovative networking solutions that scale to support and benefit Telenor's customers in the 5G era."

Cisco Partners with Perch Security to Help MSPs Respond to Threat Landscape

Cisco is partnering with Perch Security to deliver a new security solution for managed service providers (MSPs) who are challenged by an evolving threat landscape. MSPs are on front lines of protecting their clients against data breaches, malware, ransomware and other attacks for which they are often unprepared. To address these threats, Cisco is applying its security expertise and portfolio to MSPs in partnership with Perch to bring them the tools that will strengthen their security posture and better protect both themselves and their clients. "The MSP space is struggling to meet the cybersecurity demands that are bearing down on them," said Karl Bickmore, CEO, SnapTech IT. "I am glad that worldwide leaders in security like Cisco and Perch Security are recognizing the problem and addressing the needs of the MSP and, ultimately, the MSP's customers. What Cisco and Perch Security are doing is bringing education, awareness, and great tools with integration to our toolset to address the gaps that most MSPs have." The combined technology solution offers clear benefits for Cisco partners and their customers by correlating events from both the endpoint and network, reducing ticket counts and lowering labor costs. Perch has integrated with Cisco Advanced Malware Protection (AMP) for Endpoints and Cisco Umbrella, ingesting their logs and feeding them into Perch's security information and event management (SIEM) solution. Features include:

Perch's Security Operations Center (SOC) provides event correlation, alert review, and custom alert options.

Perch's Duo integration correlates Duo Multi-Factor Authentication and endpoint visibility with data from other Perch-connected cloud services, such as Office 365, Cisco Umbrella and Cisco AMP.

By combining these solutions into a single pane of glass, alerts are correlated and consolidated to reduce tool sprawl.

Perch feeds data from cloud services and security products into a single data lake that is monitored by Perch SOC.

"This is a great example of how we're continuing to work closely with our partners and have them accelerate their opportunities across the entire customer experience," said Nirav Sheth, Vice President, Partner Solutions, Architectures and Engineering, Global Partner Organization, Cisco. "As customers reimagine their applications, transform their infrastructure, empower their teams, and secure their data - our entire portfolio is managed services ready." This announcement ties into the newly created Cisco Secured MSP offer, which includes a free, internal use license program and gives MSPs the ability to elevate their internal security and protect themselves from attack. This works by using the industry-leading DNS solution from Cisco Umbrella for MSP, Next-Generation Endpoint Detection and Response with Cisco Advanced Malware Protection (AMP) and cloud-based threat detection from Cisco Stealthwatch Cloud. The Cisco secured MSP offer brings the best of security to every MSP and the knowledge and training to get it right the first time through the Protect Your House course on ConnectWise MSP University. Cisco helps partners grow managed service revenue with incentives, promotions and market development funds (MDF). "Small to medium-size businesses are looking to MSPs as their trusted technology advisor, and with this responsibility comes the need to protect them from the ever-increasing threat landscape," said Marc Inderhees, Partner Managed Services Leader, Global Partner Organization, Cisco. "They are easy targets for cybercriminals and often the least prepared. MSPs are now on the front lines of protecting their clients against data breaches, malware, ransomware, and other attacks and often are feeling unprepared." "The threat landscape, shortage of security experts and the ever-increasing number of security products are forcing partners to look for co-managed threat detection and response solutions," said Aharon Chernin, CEO, Perch Security. "For this reason, Perch is excited about expanding our ecosystem and our advanced integrations with Cisco. This gives our partners better visibility into their customers' environments and brings efficiency to our security operations center. Increased visibility allows Perch to find more threats and take better automated actions. You will continue to see us innovate and provide enhanced integrations with additional Cisco products." Join Cisco at ConnectWise IT Nation Connect in Orlando, FL, October 30 through November 1 to learn how Cisco is securing MSPs and their clients. Along with security, Cisco is sharing the details of its updated Cloud and Managed Service Program (CMSP), bringing the best to Cisco MSP partners of all sizes. If you can't make IT Nation, check out the new Cisco MSP partner site, your one-stop for all things MSP related.

Cisco Predicts Major Backhaul Upgrades for 5G

Cisco is at Mobile World Congress Americas this week, which raises the question: Why? Cisco isn't typically thought of as a radio access network (RAN) vendor, and its name doesn't immediately come to mind — such as Ericsson and Nokia — when thinking of the mobile vendor ecosystem. But Jonathan Davidson, Cisco GM of service provider networking, said, with typical Cisco confidence, "Cisco is the most important 5G vendor in the world." He said when mobile carriers are building their 5G networks they have to select vendors in three key areas: They have to pick a radio vendor; they need a backhaul vendor to rebuild their network because the current network can't handle the 5G speeds; and they need a 5G core vendor. Cisco participates in two of the three: backhaul and core. And actually, it's also beginning to help drive the Open vRAN ecosystem. Davidson said 5G is going to need a lot of backhaul upgrades. "Globally, the average backhaul is less than 5 Mbps," he said. And even though there's a perception that backhaul in major metro areas is all built from high-capacity fiber, Davidson said, "You still see a lot of these big round domes with a lightning bolt on them. That's microwave." He described much of the existing backhaul network in America as "a really low capacity network." And when 5G starts to become pervasive, and it's delivering speeds over 1 Gbps, he added that, "You need a new backhaul network. You absolutely need to have it." In addition to being poised to deliver upgraded backhaul, Cisco is also positioned to help carriers upgrade their core networks for 5G. Gogo today announced that it selected Cisco to provide core network solutions that will power Gogo's nationwide air-to-ground (ATG) 5G network. Gogo said it selected Cisco because of its expertise in providing 4G/5G solutions for some of the world's largest wireless telecommunications networks. In fact, Cisco's work with Rakuten, the Japanese company that's building a greenfield 4G/5G network, is giving it some good cred as a leading vendor of next-gen mobile core networks. Rakuten has been very open about the buildout of its new, fully virtualized, cloud-native network. It said in February that it had hired Cisco to build its network functions virtualization infrastructure (NFVi) with 4,000 edge nodes. And Cisco is also the primary systems integrator for Rakuten's virtualized telco cloud. Today, Michael Beesley, Cisco CTO for service provider networking, elaborated on the company's work with Rakuten. He said the new network comprises three layers of compute. The 2,000 to 4,000 nodes (or cloud RAN locations) are fitted with x86 compute and distributed unit (DU) and centralized unit (CU) functions. The next layer of compute includes more than 100 locations for distributed user plane functions for the packet core. Beesley said these sites host three or four racks of compute per location. Finally, Rakuten's network has two main data centers, which handle all the compute for the central control functions. All of the compute in Rakuten's network is based on x86 servers. "One of Rakuten's philosophies was to really anchor all their technology onto a small number of commodity building blocks," said Beesley. "It helps them a lot with economies of scale and with pricing." While this makes a lot of sense for Rakuten, it's kind of amazing that Cisco is on board with it. A few years ago, it felt as if Cisco was resisting the trend toward generic hardware and was holding onto its proprietary-hardware roots. But Davidson said, "There's no point in fighting the ocean." And he said Cisco actually contributes a lot of networking code to open source groups such as the Linux Foundation. While Cisco is banking on 5G for new business from backhaul and core, it's also dabbling in virtual RAN by leading the charge on Open vRAN. Its partners on this initiative currently include Altiostar, Mavenir, Parallel Wireless and JMA Wireless, among others. Asked if Open vRAN conflicts with the work of the O-RAN Alliance, Davidson said he doesn't see them as competitive at all. "It would be difficult to do Open vRAN if O-RAN didn't exist. O-RAN is about defining interfaces and APIs. Open vRAN is about making sure all these elements actually work together," he said, adding that it's a "take-to-market" initiative with joint partners.

Cisco SD-WAN Services Help Altice USA Offer Better Ways for Enterprises to Manage Their Networks

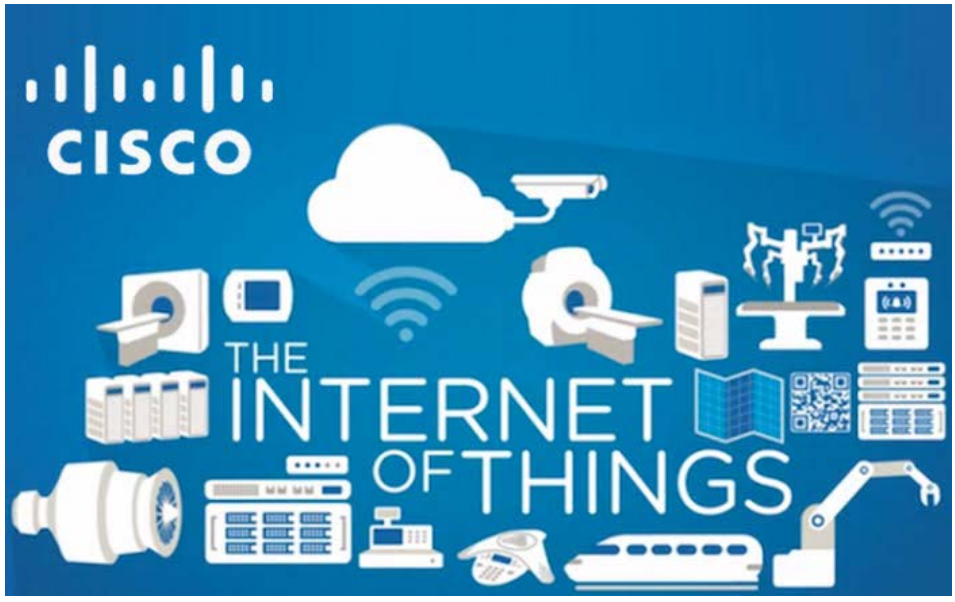
Altice USA is working with Cisco to expand the scale of its Software-Defined Wide Area Networking (SD-WAN) service offerings to enterprises, to help improve user experiences and gain greater flexibility in how they manage network applications. SD-WAN software technology provides the network intelligence required to connect remote work forces with cloud-based applications and data. Using Cisco's Managed Services Accelerator (MSX) platform, Altice USA can offer its enterprise customers a host of differentiated services in a seamless, reliable, and secure manner. With this innovative leap forward, Altice business customers can have their managed services turned up quickly, managed securely from the cloud and modified easily using software-defined networking technology. Additionally, this solution will enable Altice to provide a new set of infrastructure and platform services in the future. "We share Altice USA's focus on driving innovation and challenging the traditional way of doing things," said Kip Compton, senior vice president, Cloud Platform and Solutions Group, Cisco. "We also share its obsession with understanding and pleasing the customer. With Cisco MSX, Altice USA can enable faster innovation and increase customer satisfaction by speeding time-to-market for SD-WAN, and other managed and on-demand services."

KDDI Picks Cisco's Virtualized Packet Core for 5G

US-based Cisco Systems announced a collaboration with Japanese telco KDDI (au) to support the latter's migration to fifth-generation technology. In the press release, the vendor confirmed that KDDI will use a range of Cisco 5G Now portfolio products, starting with the Cisco Virtualized Packet Core – at the heart of the network – and Control and User Plane Separation (CUPS) architecture, to offer improved services to its customer base in Japan. The installation of Cisco's 5G virtualized packet core will allow the mobile operator to 'accelerate its 5G and IoT innovation with enterprise customers, offering more flexible and competitive pricing,' said Cisco. KDDI is looking to develop 5G to include a range of innovative areas such as smart factory, self-driving cars, remote control, telemedicine and stadium watching with free viewpoint video, it confirmed.

Cisco Says It Expects Rapid Future Development of 5G Mobile Technology will be a Boom for Industrial IoT Use Cases

While 5G deployments are nascent, Cisco says it expects rapid future development of the mobile technology will be expand industrial IoT use cases. The IIoT includes a broad range of products from connected sensors, robots and machinery to vehicles, building automation, asset tracking and remote agriculture systems. And in the industrial networking realm there are wireless access technologies including low-power wide-area networks (LoRaWAN), Narrow Band-IoT and others. 5G on the other hand – according to a recent Network World article is "an umbrella term to describe a set of standards and technologies for a radically faster wireless internet that ideally is up to 20 times faster with 120 times less latency than 4G, setting the stage for IoT networking advances and support for new high-bandwidth applications." In a recent IIoT white paper, Cisco wrote about the plethora of networking options open to the IIoT, noting "prominent examples include standards from the IEEE family of networking protocols, like 802.3 Ethernet, 802.1 time sensitive networking (TSN), and different versions of 802.11 and 802.15.4. "There is Bluetooth low-energy (BLE), and an evolving set of cellular technologies developed by 3GPP, including 3G, 4G LTE with NB-IoT and Cat-M1 targeting low cost massive sensor deployments." The emerging 5G standards with New Radio (NR) are targeting new capabilities such as vehicle-to-everything and ultra-reliable low-latency communication for industrial use cases. And there are industrial communication buses standardized by IEC, such as PROFINET and Modbus, Cisco stated. "The industrial IoT market is among the most fractured especially amongst the verticals like healthcare and automotive," said Lee Doyle, principal analyst with Doyle Research. "Large companies such a Cisco, HP and IBM have been challenged to address it because it is so fractured. It's not at all clear any one of them has the overall network architecture to handle it all." Vendors need to show users on a case-by-case, application-by-application basis what works, Doyle said. While the market for IIoT networking may be wide open, experts predict 5G and other technologies such as Wi-Fi 6 will noticeably alter the mobile enterprise for many users. "Clearly there is no single access technology out there that solves all the problems and challenges of networking especially in the industrial arena where customers have one of every type of communications device imaginable, but 5G and Wi-Fi 6 will deliver a whole bunch of new use cases and address many multi-access requirement challenges," said Liz Centoni, Senior Vice President and General Manager of Cisco's Internet of Things Business Unit, in an interview.



Eutelsat Launches an Integrated IoT Connectivity Service Via Satellite

On the eve of the IOT Solutions World Congress in Barcelona, Eutelsat Communications (Euronext Paris: ETL) announces the launch of a pioneering satellite-based IoT connectivity service: Eutelsat IoT FIRST. Having recently unveiled its ELO constellation of nanosatellites in Low Earth Orbit, dedicated to the Internet of Things, Eutelsat has taken further steps towards its ambition to become a leading satellite IoT company through the launch of Eutelsat IoT FIRST: a fully integrated IoT connectivity service operating in Ku-band via Eutelsat's geostationary satellites. Targeted companies include selected satellite service providers, telecom operators and IoT service providers. At a price point proposed on a par with cellular-based IoT connectivity services, Eutelsat IoT FIRST integrates satellite terminals, space and ground segments, packaged within an API-based service delivery framework. With this product, Eutelsat is further addressing the connectivity challenges of industries spanning across retail, banking and security, through to energy, mining and agriculture, which seek a cost-effective and reliable IoT solution to connect their fixed assets, irrespective of their location. Eutelsat IoT FIRST also acts as an IoT backhaul service, enabling telecom operators to connect IoT base stations and gateways to their core network. Focusing currently on treating fixed assets, as of next year Eutelsat will then expand its portfolio of IoT services to incorporate the connectivity of mobile assets. The ground infrastructure designed to serve Eutelsat IoT FIRST consists of a network of IoT-specific hubs hosted at teleports across the globe. These hubs are monitored and controlled 24/7 by Eutelsat's service delivery team from Turin, Italy. Luis Jimenez-Tunon, Group Executive Vice President Data Business of Eutelsat "The reliability and boundless reach that satellite offers means that it will have an integral role in the IoT sector and in this regard, I am delighted to launch "Eutelsat IoT FIRST", named in the honor of this service being a pioneer of its kind and Eutelsat's inaugural solution in its ambitious IoT roadmap."

Successful Launch of EUTELSAT 5 West B

Gogo a leading global provider of broadband connectivity products and services for aviation, together with Eutelsat Communications (Euronext Paris: ETL), one of the world's leading satellite operators, announced a new satellite capacity agreement for high-speed inflight connectivity services. As part of the new multi-year agreement, Gogo has leased HTS bandwidth on EUTELSAT 10B satellite, to be leveraged over Europe and the Middle East. The new satellite is set to launch in 2022. "We are advancing capacity capabilities given the growing demand for high-speed inflight connectivity services," said Oakleigh Thorne, president and CEO of Gogo. "Through our partnership with Eutelsat, Gogo 2Ku will continue to enable the best passenger experience for global airlines." "We are thrilled about our ongoing relationship with Gogo, a long-standing partner and a leading provider for inflight connectivity," said Philippe Oliva, Eutelsat's Chief Commercial Officer. "This agreement highlights the relevance of our newly ordered EUTELSAT 10B for inflight connectivity and we look forward to supporting Gogo as they increase capacity in Europe and the Middle East to provide the best services to their airline partners."

Gogo Meets Significant Inflight Connectivity Demand through Deal with Eutelsat

Gogo a leading global provider of broadband connectivity products and services for aviation, together with Eutelsat Communications (Euronext Paris: ETL), one of the world's leading satellite operators, announced a new satellite capacity agreement for high-speed inflight connectivity services. As part of the new multi-year agreement, Gogo has leased HTS bandwidth on EUTELSAT 10B satellite, to be leveraged over Europe and the Middle East. The new satellite is set to launch in 2022. "We are advancing capacity capabilities given the growing demand for high-speed inflight connectivity services," said Oakleigh Thorne, president and CEO of Gogo. "Through our partnership with Eutelsat, Gogo 2Ku will continue to enable the best passenger experience for global airlines." "We are thrilled about our ongoing relationship with Gogo, a long-standing partner and a leading provider for inflight connectivity," said Philippe Oliva, Eutelsat's Chief Commercial Officer. "This agreement highlights the relevance of our newly ordered EUTELSAT 10B for inflight connectivity and we look forward to supporting Gogo as they increase capacity in Europe and the Middle East to provide the best services to their airline partners."

Eutelsat Orders Eutelsat10B Satellite for Inflight and Maritime Connectivity Services

Eutelsat Communications has signed a letter of agreement with Thales Alenia Space for the procurement of EUTELSAT 10B, a new all-electric satellite built on the Spacebus NEO platform. Scheduled to be launched in 2022, the satellite will be located at 10Â° East, an orbital position that offers a unique visibility spanning from the Americas to Asia. It will ensure service continuity for existing customers on EUTELSAT 10A, while supporting the development of the Group's activities in mobile connectivity thanks to two new incremental HTS payloads.

Eutelsat Statement on Eutelsat 5 West B

Eutelsat Communications (Euronext Paris: ETL) is currently investigating an incident on one of the two solar arrays on its EUTELSAT 5 West B satellite. Eutelsat is working to assess the potential impact on the performance of the satellite and will communicate on it as quickly as possible.
For information purposes:
Revenues generated in FY 2018-19 by EUTELSAT 5 WEST A, which EUTELSAT 5 WEST B is due to replace, amounted to circa €30 million;
EUTELSAT 5 West B is fully insured against the eventuality of loss by a launch-plus-one-year insurance.

Huawei Founder Meets Press from the Arab World

Ren Zhengfei, Founder and CEO of Huawei, recently met with a contingent of media from across the Middle East and North Africa (MENA) to share his thoughts on the region's bold digital transformation efforts—and Huawei 's plans for supporting local partners to scale digital services to more people, homes, and organizations than ever before. The Global Executive acknowledged the Arab world's long and profound history, particularly its mastery of mathematics, geometry, and engineering design. "The Silk Road established by our ancestors connected the cultures of China, Central Asia, and the Middle East, and we have great admiration for it. We should continue in the spirit of the Silk Road today with 5G and high-speed rail. This will drive the economic growth of the entire region," commented Zhengfei. "Moreover, we believe that the Middle East will become one of the world's highest grounds for 5G, and that 5G will be the infrastructure of this rejuvenated civilization." 5G networks have already seen large-scale commercial deployment internationally. In the region, Middle East countries have been in the first

wave of 5G commercial launches, standing at the global forefront. Addressing the expansion of 5G in particular, Zhengfei noted that these cutting-edge technologies will help MENA countries to bridge the digital divide and contribute to cultural and educational development. Zhengfei referenced how Huawei itself has greatly depended on its people and intellect to expand, rather than natural resources alone. "The key to rejuvenating any country or nation lies in education. Today, knowledge is our oil, our forests, and our coal," the executive stated. "The advancement of 5G and AI can create more wealth than ever for a society. But in the new era, when ICT becomes a main driver of productivity, resources must be used to provide support for people and to give them training." Zhengfei was also candid in addressing the ICT industry's cyber security challenges and Huawei's evolving relationship with American technology companies. "When countries regard physical resources as wealth, geographical boundaries are very important. However, the wealth of digital technologies is global and transcends boundaries," said Zhengfei. He confirmed that Huawei is currently in discussions with countries around the world about signing a "no backdoor" agreement to safeguard data on its networks. For things like 5G base stations, transmission networks, and core networks, Zhengfei also noted that Huawei doesn't rely on US parts or components at all, so won't be affected by US sanctions on that front. Today the MENA region remains a strong market for Huawei globally. During the company's recent Huawei Middle East Innovation Day 2019, held earlier this month, the company met with experts from government, telecom, and enterprise sectors to accelerate 5G expansion, AI innovation, and support local ICT developers. Its regional growth comes at a time when both the public and private sectors are making

critical investments in ICT infrastructure. "Our main direction is to move forward with new technology and explore what's next. The exploration itself is a contribution to society," believes Zhengfei. The executive's latest interviews come shortly after Huawei announced its business results for the third quarter of 2019. During the first three quarters of this year, Huawei global revenues increase by 24.4% year-on-year. Huawei has maintained its focus on ICT infrastructure and smart devices in its efforts to help build a fully connected, intelligent world. By the end of Q3 2019, more than 700 cities, 228 Fortune Global 500 companies, and 58 Fortune Global 100 companies had selected Huawei as their partner for digital transformation.

Huawei Launches 5G-Oriented Efficient Automatic Service Provisioning Solution WTTx Suite 2.0

Huawei launched a 5G-oriented efficient automatic service provisioning solution, WTTx Suit 2.0, at the 10th Mobile Broadband Forum. With the rapid development of wireless technologies, wireless fiber broadband has become the preferred option that accelerates broadband speeds. 5G large-bandwidth spectrum allocation and innovative 5G technologies can achieve higher spectral efficiency, further improving wireless broadband capacity and reducing per-GB costs. WTTx Suite 2.0 combines AI technologies to provide WTTx services within a single day, and support remote service management at the network and customer-premises equipment (CPE) levels, achieving sustainable development of wireless broadband services. Traditional wired broadband service provisioning usually takes several weeks or even several months. For wireless broadband services with WTTx Suite, once user addresses are entered, the most appropriate packages and CPE specifications that can be provisioned are provided based on network load and capacity, as well as historical network data analysis. Services are quickly provisioned and managed through this method, which improves service deployment efficiency. WTTx Suite 2.0 supports service provisioning for all frequency bands in the 5G era, and based on the high-frequency features of the 5G network, it also supports to provide service provisioning suggestion based on building level in dense urban. In addition, service provisioning precision has improved from the cell level to the beam level. By introducing artificial intelligence technology and integrating the 3D ray tracing model, WTTx Suite 2.0 can now update the service provisioning map online within 30 minutes as opposed to two weeks. This improves the efficiency and reliability of service provisioning. In areas with both mobile services and wireless broadband services, WTTx Suite can collect statistics on cell load, average speed, and coverage; analyze the development trend of wireless broadband (WBB) and mobile broadband (MBB) in real time; and provide end to end (E2E) experience assurance, thereby reducing the churn rate and ensuring the coordinated development of multiple services. In addition to wireless broadband services, WTTx Suite 2.0 supports quick provisioning and management of multiple services such as Video over WTTx and enterprise service (WTTe). With WTTx Suite 2.0, Huawei implements organized service provisioning of the WTTe service as well as unified and efficient device management for existing commercial terminals, improving maintenance efficiency and reducing costs. By now, WTTx Suite have been deployed in more than 60 networks in 35 countries worldwide. The 5G-oriented WTTx Suite 2.0 solution will be generally available in Q1 2020. It can

be closely integrated with the service provisioning and management workflows of operators. Starting from the full lifecycle of services, this solution facilitates rapid development and efficient management of wireless broadband services in the 5G era and comprehensively promotes the development of the broadband industry. This not only meets the requirements for rapid home broadband (HBB) in developed countries but also accelerates the penetration of affordable HBB services in developing countries." The 2019 Global Mobile Broadband Forum is attended by more than 1,600 people from operators, industries, vertical markets, standard and industry organizations, as well as media and analyst firms, from all over the world. Demonstrations on site showcase the latest 5G technology solutions, commercial cases and the rich applications including 5G cloud AR/VR, live 8K broadcast over 5G, and machine vision and remote control powered by 5G, etc.

Fifth-Generation Fixed Network Boosting the Gigabit Industry

At the 2019 Broadband World Forum Gigaband Industry Summit, European Telecommunications Standards Institute (ETSI), China Academy of Information and Communications Technology (CAICT), Wi-Fi Alliance®, well-known analyst firm Ovum, and multiple mainstream operators around the world held intense discussions on how to leverage the fifth-generation fixed network to promote the global gigabit ecosystem. In the keynote speech at the summit, David Boswarthick, Director New Technologies of ETSI, said, "Looking back on the development history of fixed networks, we have experienced the 64 kbps narrowband era represented by PSTN/ISDN, 2 Mbps era represented by ADSL, 20 Mbps era represented by VDSL, and 100 Mbps era represented by GPON/EPON. Currently, we are entering the fifth-generation Gigabit era (1–5 Gbps) represented by 10G PON. With effective collaboration with wireless technologies such as 5G, Gigabit fiber networks are providing a flexible and high-performance connectivity network for the Telecom Industry as well as opening up exciting new opportunities in numerous vertical industries." Compared with previous generations, the Fifth-Generation Fixed Network features full-fiber connection, ultra-high bandwidth, and ultimate experience. Fibers will connect not only homes, but also more vertical industries such as enterprises, transportation, security, and campuses. Symmetric Gigabit and Wi-Fi 6 will further upgrade network capabilities. End-to-end network latency will become lower and more stable, and operators will shift from traffic-centric operation to experience-centric operation. Meimei Dang, Vice Chief Engineer in the ITSR(Institute of Technology and Standards Research), CAICT, said in her speech, "As cloud VR, smart home, gaming, social networking, cloud desktop, safe city, enterprise cloud

private line, online education, telemedicine, and smart manufacturing become more popular, the full-fiber gigabit network will directly generate trillions of revenues for related industries, and Gigabit broadband has become the focus of global broadband development." At the summit, Kevin Robinson, Vice President of Marketing at Wi-Fi Alliance, said, "Wi-Fi 6 brings a new era of Wi-Fi connectivity, delivering better capacity, coverage, and performance even in the most demanding environments. As bandwidth demands increase, Wi-Fi 6 delivers new capabilities that bring more power and performance in environments including home, enterprise, and industrial IoT. New features enable a variety of advanced applications including those that require support for a large number of clients at once in large venues and campuses and those applications that facilitate vast amounts of traffic including AR/VR and Ultra HD streaming." Julie Kunstler, Principal Analyst of OVUM, said, "More than two hundred operators in the world have released gigabit services, and twenty operators have released 10G services. 10G PON has become a basic technology for gigabit networks. In the next five years, it is estimated that the compound growth rate of 10G PON OLT ports in the central office will reach 41%, and that of 10G PON ONTs will reach 124%." Besides, mainstream European and Latin-American operators from Switzerland, France, Paraguay and Turkey, shared their successful experience in building gigabit FTTH networks. Jeffery Zhou, President of Huawei Access Network, said, "We cannot agree more with industry organizations, analysts, and operators on their ideas about the fifth-generation fixed network and Gigabit era. They have drawn a blueprint for the global fixed broadband development. Huawei is dedicated to working with industry partners to promote the Fifth-Generation Fixed Network; to extend full-fiber coverage to each room, desktop, and machine; and to share the trillion-dollar blue ocean across the industry chain." As the leader of fixed network industry, Huawei provides the SingleFAN Pro solution to efficiently provide multiple services under various scenarios, bringing the three values of "new blue ocean, new capabilities, and new experience" to operators. To date, Huawei has delivered 1.5 million 10G PON ports, and helped more than 80 operators around the world to achieve large-scale FTTH deployment.

World's First 8x8 MIMO Outdoor CPE Commercialized for Maximum LTE Network Value

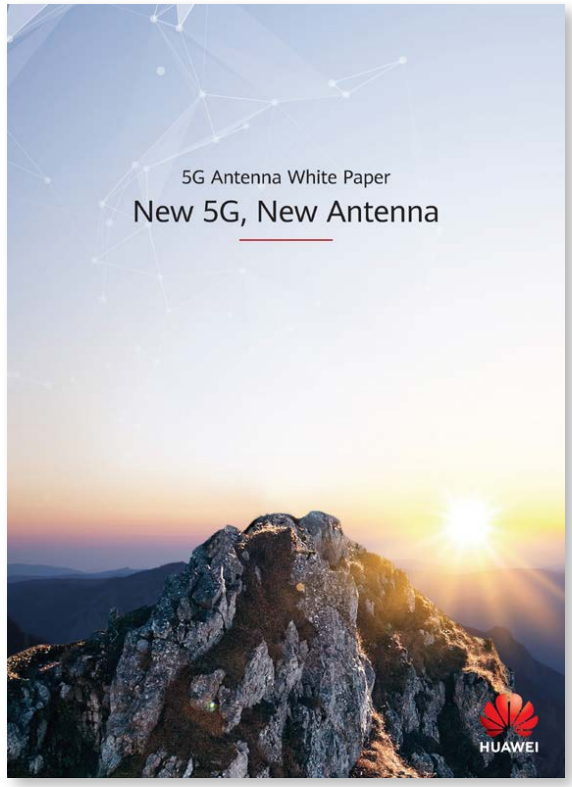
Huawei announced the commercial availability of the world's first 8x8 MIMO LTE outdoor CPE (customer-premises equipment) B3368. B3368 provides an experience of up to 1 Gb/s and triples FWA capacity compared to MBB benchmarks. This innovation enables operators to provide fiber-like services over LTE networks while maximizing both spectral efficiency and the value of LTE networks. Global LTE fixed wireless access broadband (4G FWA) has achieved rapid development, with 4G/5G FWA expanded from suburban to urban areas, from low-speed copper lines to high-speed optical fiber, and from homes to small- and medium-sized enterprises (SMEs). Smart home, 4K, and AR/VR services are mature, requiring fixed broadband rates to increase from 10–20 Mb/s to 25–100 Mb/s. Huawei's latest LTE CPE B3368 enables operators to quickly deploy 4G FWA services by leveraging LTE networks to provide fiber-like experiences, which will be essential for operators to win high-value fixed broadband users and sustain continuous revenue growth. 1Gb/s rate for a fiber-like premium experience: B3368 supports all FDD and TDD bands, 4CC CA with a maximum bandwidth of 80 MHz, and 256QAM. By combining the powerful functions, this product supports a peak rate of up to 1 Gb/s. Tripled spectral efficiency and provisioning capabilities: B3368 supports up to 8x8 MIMO and 4-SRS antenna selection. Together with Huawei's leading Massive MIMO base stations, this product delivers a tripled capacity over MBB base stations. Service provisioning capability is also tripled, reducing per-line costs by 60% and enabling operators to extend broadband services to more homes and enterprises without deploying new base stations, maximizing the network value. Smart antenna selection simplifies installation and reduces costs: B3368's built-in antennas support smart antenna selection, meaning that the base station providing the best signal quality is always selected during initial installation and upon network changes without requiring manual adjustment of antenna azimuths. Installation efficiency is tripled, reducing installation and maintenance costs. Zhang Yiqu, Director of Huawei's WTTx Domain, said: "4G/5G FWA enables operators to achieve rapid provisioning of fixed broadband services. In 2018, 4G FWA connections outgrew FTTH in markets outside China. 4G/5G FWA services are also ushering in an era of Wireless Fiber. Wireless Fibers will contribute to further widespread usage and development of fixed broadband." By September, 2019, more than 230 4G FWA networks have been deployed globally. Huawei's LTE CPE B3368 will enable operators to increase home broadband speeds in developed countries while increasing the availability of affordable home broadband in developing countries, bridging digital divides among families, and achieving the goal of "Broadband for All, Wireless First".

Huawei 5G OpenLab in the Middle East Announced at GITEX 2019

The pre-launch of the Huawei 5G OpenLab in the Middle East was announced during GITEX 2019 by Huawei, a leading global provider of information and communications technology (ICT). The Huawei 5G OpenLab in the Middle East aims to boost 5G services throughout the Middle East region, prompting innovation and collaboration across markets with the intention of creating an open ecosystem that will further ICT development across the region. Huawei 5G OpenLab in Middle East will mainly focus on the 2B market, including artificial intelligence (AI) solutions, fixed wireless access (FWA), CCTV, campus private line, and more. Consumer services, such as cloud gaming, will also be a focus of the OpenLab. "5G development is accelerating at speeds beyond imagination, with roll-out imminent in markets across the Middle East and the wider world," said An Jian, President of Carrier Networks Business Group, Huawei Middle East. "By introducing the Huawei 5G OpenLab concept in the Middle East, we are providing the local ICT sector with a real 5G network environment in which they can experience, innovate, and verify the latest 5G applications with operators and partners. This will contribute to the development and strengthening of the local ICT sector, enabling the introduction of next generation technology that will contribute to building a fully connected, intelligent world." Zhang Dong, Vice President of Huawei 5G Marketing & Solution Sales, said: "5G OpenLab is a cross-industry platform through which operators, third parties and vertical industries in the Middle East can work together to understand business scenarios, develop innovative services, and build the 5G ecosystem." Through the OpenLab platform, Huawei works with customers and partners around the world to develop the best possible industry-specific solutions, enrich local ICT industry ecosystems, address challenges and future demands in line with local markets' requirements, and keep driving customers to go digital. Huawei 5G OpenLab in Middle East is scheduled for launch in December 2019.

Huawei Releases 5G Antenna White Paper to Unveil 3 Major Industry Trends

Huawei released 5G Antenna White Paper at the 8th Global Antenna Technology & Industry Forum that is taking place in Amsterdam. The white paper presents an elaborate analysis of antenna industry's trending developments for evolution to 5G, simplified deployment, and AI-based operation and maintenance. It also offers thoughtful insights into the fundamental characteristics, coordinated design, and value outlook for the intelligent operation and maintenance of 5G antennas. The white paper suggests that all-band beamforming is a fundamental characteristic of 5G antennas. The evolution of mobile broadband (MBB) networks to 5G, fueled by an increasingly mature 5G industry chain, is driving the "all-band-to-5G" transition. High-precision beamforming enables higher reference signal received power (RSRP) and signal to interference plus noise ratio (SINR) performance. 5G antennas are already capable of implementing high-precision beamforming on the C-band and TDD 2.6GHz band. In future, FDD sub-3GHz bands will also support this function so as to ensure better network performance. The white paper also considers coordinated design as an important attribute of 5G antennas. The 5G era will usher in an unprecedented level of coordination between radio access networks (RANs) and antennas. End-to-end (E2E) antenna coordinated design will evolve into an integral capability of the antenna industry. In addition, the "all-band-to-5G" transition demands simplified site deployment, all-band beamforming, active antennas, and ultra-wideband support of RF modules. This new trend will accelerate the RAN-antenna coordination shift from performance coordination in 4G to a comprehensive coordination across component, product, and feature levels, so as to better address 5G network configuration and performance requirements. The white paper points out that 5G antennas will deliver many network benefits, including intelligent and simplified network management. As an example, scenario-specific 3D beam adaptation will enable additional self-optimization functionality on mobile networks, intelligent channel shutdown will improve network energy efficiency, and high-precision real-time positioning for mMTC applications will enable GPS-free locating for



Internet of Things (IoT) terminals. "5G represents a new era of mobile networks while also leading the antenna industry toward new horizons" said Zhang Jiayi, President of Huawei Antenna Business Unit, "Huawei is committed to creating platforms for cooperation and innovation in the antenna industry, enabling mobile network operators to transition to the 5G era and achieve business success."

Huawei Middle East Innovation Day 2019 Reaffirms Digital as the Driving Force behind Today's economy

During its fourth annual Middle East Innovation Day, Huawei, a leading global provider of information and communications technology (ICT) infrastructure and smart devices, explored how new partnerships in the areas of Artificial Intelligence (AI) and 5G are now scaling digital services to more people, homes, and organizations than ever before. The event was held on the second day of GITEX Technology Week at the Dubai World Trade Centre. Huawei Innovation Day incorporated three bespoke sessions: a 5G Ecosystem Conference under the title "5G, Gear Up"; an AI Conference under the theme "Advance Intelligence", and a "Huawei Developer Day Dubai 2019" session, which focused on building a better ecosystem for Huawei partners and developers. Huawei Innovation Day was attended by Jawad Abbasi, Head of MENA, GSMA, and Huawei's distinguish customers from more than 20 telecom operators in Middle East, and industry partners among other industry leaders, the total attendance exceeded 300. Involving regulators, telecom operators, industry partners, analysts, and other ecosystem players, the conference reviewed global 5G case studies and explored how 5G is bringing infinite possibilities not only to individuals but to vertical industries across the Middle East. To date, Huawei has secured more than 50 commercial 5G contracts while shipping more than 200,000 base stations worldwide. Anjian, President of Carrier Networks Business Group, Huawei Middle East, noted: "Since 2009, Huawei has invested 4 billion USD in 5G research. We are not only providing the best 5G network, but also willing to explore 5G business success with our customers and partners. To reach customer-oriented business success, we are committed to increasing investment in three major areas: 1. Continuous investment in 5G technology capability, which adapts to customers' business requirements, and brings infinite

possibilities not only for person but also for industries. 2. In terms of business development and 5G use case exploration, we will persistent invest human and financial resources in business development to provide more 5G use case solutions going to market with our customers; 3. Further developing the 5G ecosystem platform, today we will announce Huawei Middle East OpenLab establishment, to work with our customers and partners to ensure the delivery of the best possible solutions that contribute to business growth and success for them. We will keep expanding and enhancing our collaborative partnership in the Middle East to cultivate a strong and inclusive 5G ecosystem in its journey to building a fully connected intelligent Middle East." During the AI Conference, "Advance Intelligence", a deep-dive session explored how local enterprises and governments are embracing AI as a key enabling technology advanced intelligence. That transformation will be facilitated by Huawei's next-generation intelligent product strategy and new +AI products for the enterprise market. By adding AI capabilities to the next-generation of ICT products, from Wi-Fi 6 to All-Flash Storage, Huawei will help customers address a new round of digital transformation challenges to achieve business success. Alaa ElShimy, Managing Director and Vice President, Huawei Enterprise Business Group, added: "The increasing scale of intelligent technologies are bringing disruptive changes to enterprises across the Middle East. With the rapid development of cutting-edge technologies such as AI, a diverse range of applications and massive amounts of data are being generated, which pose demanding requirements on real-time data processing. Data infrastructures must be upgraded to fulfill these demands. We believe that AI will promote innovation across the region and will change the way entire industries are run." At the HUAWEI Developers Day section, HUAWEI introduced the Huawei Mobile Services (HMS) Ecosystem based on the core framework of HUAWEI Mobile Services (HMS Core and Capabilities) and Developer Services. To date, HMS Core has opened up 14 capabilities to help developers build high-quality applications at low cost and quickly, and continuously improve the app user volume and activity. Shining-Star Program had been announced, investing 1 billion USD to support global developer to keep contributing in HMS ecosystem construction. Also, the first DigiX Innovation Studio will further expand throughout the globe, with eight DigiX Labs in 6 main regions including Dubai, providing great supports to global developer's innovation, including device testing, experience of capability development and tool etc. "We sincerely invite all local partners to join our ecosystem construction, that's why we had invested 1 billion USD in Shining-Star Program and building the first DigiX innovation labs in Dubai to fully support them." Said Adam Ersong Xiao, Managing Director of MENA Mobile Services, HUAWEI Consumer Business Group. The Innovation Day comes at a time when both the public and private sectors are making critical investments in ICT infrastructure. Digital innovation is now at the forefront of many national development plans in the Middle East, and is seen as a crucial ingredient to diversifying local economies, creating future jobs, while accelerating sustainable development. The combination of 5G connectivity and AI will be particularly powerful as it enables more people, things, and devices to share advanced intelligence than ever before. According to Huawei's recent Global Industry Vision (GIV) report, the company predicts that nearly 60% of the world's population will have access to 5G by the end of 2025, and 97% of large companies will have deployed AI as applications. It is reported that AI will contribute US$320 billion to the Middle East economy by 2030, which indicates the large impact AI will have on the region with the governments' support and implementation. The countries expected to gain the most in their GDP from AI by 2030 are the UAE with 14%, in which AI will contribute to their GDP the most are: the UAE at 14% increase, followed by KSA at 12.4%. Huawei's participation at GITEX 2019 is supported by some of its key partners including GAPP and Redington as Diamond sponsors; Enterprise Systems and Octalpha as Gold sponsors.

Microsoft and Novartis Announce Collaboration to Transform Medicine with Artificial Intelligence

Novartis announced an important step in reimagining medicine by founding the Novartis AI innovation lab and by selecting Microsoft Corp. as its strategic AI and data-science partner for this effort. The new lab aims to significantly bolster Novartis AI capabilities from research through commercialization and help accelerate the discovery and development of transformative medicines for patients worldwide. As part of the strategic collaboration announced, Novartis and Microsoft have committed to a multi-year research and development effort. This strategic alliance will focus on two core objectives:

AI Empowerment. The lab will aim to bring the power of AI to the desktop of every Novartis associate. By bringing together vast amounts of Novartis datasets with Microsoft's advanced AI solutions, the lab will aim to create new AI models and applications that can augment our associates' capabilities to take on the next wave of challenges in medicine.

AI Exploration. The lab will use the power of AI to tackle some of the hardest computational challenges within the life sciences, starting with generative chemistry, image segmentation & analysis for smart and personalized delivery of therapies, and optimization of cell and gene therapies at scale.

Microsoft and Novartis will also collaborate to develop and apply next-generation AI platforms and processes that support future programs across these two focus areas. The overall investment will include project funding, subject-matter experts, technology, and tools. Vas Narasimhan, CEO of Novartis, said, "As Novartis continues evolving into a focused medicines company powered by advanced therapy platforms and data science, alliances like this will help us deliver on our purpose to reimagine medicine to improve and extend lives. Pairing our deep knowledge of human biology and medicine with Microsoft's leading expertise in AI could transform the way we discover and develop medicines for the world." Microsoft CEO, Satya Nadella, added, "Our strategic alliance will combine Novartis' life sciences expertise with the power of Azure and Microsoft AI. Together, we aim to address some of the biggest challenges facing the life sciences industry today and bring AI capabilities to every Novartis employee so they can unlock new insights as they work to discover new medicines and reduce patient costs." Novartis is focusing itself as a leading medicines company powered by advanced therapies and data science. Going big on data and digital is a key strategic pillar that helps Novartis realize that ambition. Data science and digital technologies allow the company to reimagine how it innovates in R&D, engages with patients and customers, and increases operational efficiencies. Novartis focuses its efforts around four strategic digital priority areas:

Scaling 12 digital lighthouse projects: Build a strong foundation and jumpstart digital transformation

Make Novartis digital: sharing, learning and talent acquisition

Becoming the #1 partner in the tech ecosystem: bridge Novartis with external expertise

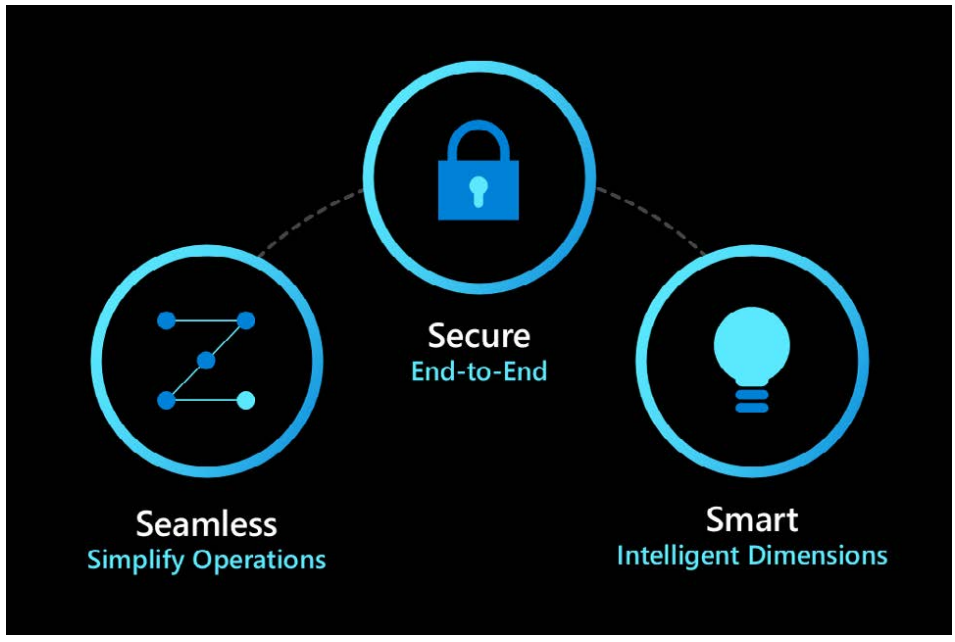
Bolder moves: lead through future disruptive healthcare scenarios with large-scale partnerships.

Microsoft to Launch Two Microservice Projects on Github

The new open source projects are intended to speed deployment of microservices in the cloud or at the edge. The projects are Distributed Application Runtime (Dapr), which is a runtime environment for microservices and Open Application Model (OAM) is a specification for running applications on Kubernetes and other platforms. By 2022, 90% of new apps will have microservice architectures according to predictions from IDC. According to a Microsoft blog, microservice architecture's benefits include scalability, loose service coupling and independent deployments, but "this approach can come at a high cost of understanding and skilling on distributed systems". Hence the point of Dapr – which is itself in the early stages of development – is that it is designed to help developers deliver microservices through the cloud or at the edge without code changes. This is because language used for the services is irrelevant: Dapr's individual building blocks can be are accessed via a local hypertext transfer protocol (HTTP) or remote procedure call (gRPC) endpoint, so a separate software development kit is not needed. Activities including service calls, state management, publish-and-subscribe messages, and event-driven resource bindings are possible with building blocks that are available now. Dapr is not coupled to any particular platform, rather applications run locally in a Kubernetes cluster or other hosting environments. The OAM standard emphasizes the separation between developer and operator on the grounds that the former should be left to better focus on the key elements of applications, not the deployment goal. This separation also means that reusable components can be created and integrated individually. OAM was developed by Microsoft in collaboration with Alibaba Cloud, under the auspices of the Open Web Foundation. Like Darp, OAM is platform independent.

Microsoft Announces New Capabilities for a Seamless, Smart and Secure IoT world

Microsoft Corp. announced new capabilities that further simplify the customer journey and deliver highly secured IoT solutions. These solutions help customers embrace IoT as a core strategy to drive better business outcomes, improve safety and address social issues by predicting and preventing equipment failures, optimizing smart buildings for space utilization and energy management, improving patient outcomes and worker safety, tracking assets across a supply chain, and more. The proliferation of IoT devices is enabling companies to bring cloud intelligence to the edge, to create solutions that are adaptive and responsive to their environments. According to IDC,1 41.6 billion devices — including smartphones, smart home assistants and smart appliances — will be connected to the internet by 2025. Even sooner, by 2021, 94% of businesses surveyed will be using IoT, according to a recent Microsoft IoT Signals research report and, in nearly every case (97%), those companies are concerned about potential security risks. "At Microsoft, we are committed to building a trusted, easy-to-use platform that allows our customers and partners to build seamless, smart, secure solutions regardless of where they are in the IoT journey," said Sam George, CVP of Azure IoT at Microsoft. "That's why we are investing $5B in IoT and intelligent edge — technology that is accelerating ubiquitous computing and bringing unparalleled opportunity across industries."



Delivering new IoT innovations from cloud to edge

Our core focus is addressing the challenge of securing connected devices at every layer while advancing IoT to create a seamless experience between the physical and digital worlds. In the past year, we launched more than 100 new services and features that make IoT solutions more secure and scalable, reduce complexity, and create opportunities in new market areas.

Making IoT seamless

IoT Central is a fully managed IoT app platform that provides solution builders with built-in security, scale and extensibility needed to develop enterprise-grade IoT solutions. New features to IoT Central simplify challenges of building and deploying scalable and affordable enterprise applications:

11 new industry-focused application templates to accelerate solution builders across retail, healthcare, government and energy.

API support for extending IoT Central or integrating it with other solutions, including API support for device modelling, provisioning, lifecycle management, operations and data querying.

IoT Edge support, including management for edge devices and IoT Edge module deployments, which enable customers to deploy cloud workloads, including AI, directly to connected devices.

IoT Plug and Play support, for rapid device development and connectivity.

The ability to Save & Load applications to enable application reusability.

More Data Export options for continually exporting data to other Azure PaaS services, such as storage for rich analytics.

Multitenancy support for building and managing a single application with multiple tenants, each with their own isolated data, devices, users and roles. And updates to that single application are visible to all tenants for easy manageability.

Custom user roles for fine-grained access control to data, actions and configurations in the system. New pricing model for early 2020, designed to help customers and partners have predictable pricing as usage scales.

Making IoT smarter

Azure IoT Hub helps enterprise developers reduce costs and optimize operations through IoT cloud applications. New capabilities with IoT Hub message enrichment add the ability to stamp messages coming from devices with rich information before they are sent to downstream cloud services, making integration easy. IoT Hub integrates with Azure Event Grid, making it easy to consume IoT Hub device messages from an even broader variety of downstream services. Azure Maps customers can add geospatial weather intelligence into their applications to enable scenarios like weather-based routing, weather-based targeted marketing and weather-based operations optimization, in partnership with AccuWeather. Azure Maps will now be available on Gov Cloud, simplifying the onboarding process for customers.

Azure Time Series Insights is announcing new preview capabilities including:

Multilayered storage provides the best of both worlds: Lightning fast access to frequently used data ("warm data") and fast access to infrequently used historical

data ("cold data").

Flexible cold storage: Historical data is stored in a customer's own Azure Storage account, giving customers complete control of their IoT data. Data is stored in open source Apache Parquet format, enabling predictive analytics, machine learning and other custom computations using familiar technologies including Spark, Databricks and Jupyter.

Rich analytics: Rich query APIs and user experience support interpolation, new scalar and aggregate functions, categorical variables, scatter plots, and time shifting between time series signals for in-depth analysis. Enterprise-grade scale: Scale and performance improvements at all layers, including ingestion, storage, query and metadata/model.

Extensibility and integration:

New Time Series Insights Power BI connector allows customers to take queries from Time Series Insights into Power BI to get a unified view in a single pane of glass. Through our Express Logic acquisition, Azure RTOS continues to enable new intelligent capabilities. It unlocks access to billions of new connected endpoints and grows the number of devices that can seamlessly connect to Azure. Renesas is a top microcontroller unit (MCU) manufacturer that shares our vision of making IoT development as easy and seamless as possible, and we are excited to announce that Azure RTOS will be broadly available across Renesas' products, including the Synergy and RA MCU families. It is already integrated into the Renesas Synergy Software Package and will be integrated out of box with the Renesas RA Flexible Software Package.

Making IoT more secure

We have added support for national clouds, and we are excited to announce the upcoming general availability of Azure Sphere in February 2020. Enabling a future of intelligent and secure computing at the edge for organizations, enterprises and consumers will require advances in computer architecture all the way down to the chip level, with security built in from the beginning. Microsoft Azure Sphere is taking a holistic approach to securing the intelligent edge and IoT from the silicon to the cloud in a way that gives customers flexibility and control. For example, Qualcomm recently announced a partnership with Microsoft to develop mobile hardware for Microsoft's Azure Sphere IoT operating system. Microsoft enables digital transformation for the era of an intelligent cloud and an intelligent edge. Its mission is to empower every person and every organization on the planet to achieve more.

Commercial Bank of Dubai Adopts the Microsoft Cloud to Accelerate Digitization

In a further boost to its digital transformation initiative, Commercial Bank of Dubai (CBD), one of the leading banks in the UAE, today announced its partnership with Microsoft for the deployment of mission critical workloads on Azure Cloud aligned with the cloud strategy. The announcement comes after the recent launch of Microsoft's two new cloud regions in the UAE, one in Dubai and one in Abu Dhabi that will aim to serve Middle East organizations by empowering them to avail the Microsoft's trusted and intelligent cloud availing high performance, scalability, security, data residency and the broadest compliance standards. Dr. Bernd van Linder, Chief Executive Officer of Commercial Bank of Dubai, said: "As part of our commitment of becoming a 'default digital' bank, we are pleased to partner with Microsoft to leverage the Microsoft Azure Cloud, which will help us increase our business efficiencies, support digital culture change and better meet our customer needs." "CBD has been focusing on digital transformation across all business lines, and this partnership will further reinforce our position as a digital and innovation leader in the financial industry, underscored by Microsoft's investment in security, transparency and regulatory compliance" he added. CBD has been implementing several initiatives to promote innovation across the financial services industry and particularly in the area of digitization to deliver engaging customer experiences. The adoption of the Microsoft Azure cloud will further enable the bank to modernize its technology landscape, enhance its performance, reinvent customer engagement and promote innovation within the entity. The move will also boost CBD's existing innovative initiatives such as Fraud prevention, AML, conversational banking user experiences, AI and analytics using the Microsoft Azure

Cloud services. "The UAE's Financial Services Industry, in recent times, has exponentially prioritized the culture of innovation across its different line of businesses, and banks like CBD have been at the frontier of this effort to achieve the vision of a truly digital bank," Said Sayed Hashish, General Manager, Microsoft UAE. "The Microsoft Azure cloud will deliver on CBD's vision to digitally transform itself into a modern banking institution that can adapt and respond to the ever-changing customer needs." CBD will be one of the first financial institutions in the UAE to leverage Microsoft's new cloud regions in the UAE. The Microsoft Azure cloud is home to several digitally innovative organizations across the Middle East, as they seek to better engage their customers, empower employees, optimize operations and reinvent products and services.

Microsoft Partners with SAP for First-in-Market Cloud Migration Offerings

Building on a joint commitment to simplify and modernize customers' journeys to the cloud through project "Embrace," SAP SE and Microsoft Corp announced an extensive go-to-market partnership — from conceptualization to sales — to accelerate customer adoption of SAP S/4HANA® and SAP® Cloud Platform on Microsoft Azure. Today's new, preferred cloud partnership brings together SAP and Microsoft, along with a global network of system integrators, to offer holistic bundles that provide customers with unified reference architectures, road maps and market-approved journeys to illuminate a clear path toward the cloud. As part of this simplified customer journey, Microsoft will re-sell components of SAP Cloud Platform alongside Azure. This unique offering is aimed at more easily migrating SAP ERP and SAP S/4HANA customers from on-premises to public cloud. "This partnership is all about reducing complexity and minimizing costs for customers as they move to SAP S/4HANA in the cloud," said Jennifer Morgan, Co-Chief Executive Officer of SAP. "Bringing together the power of SAP and Microsoft provides customers with the assurance of working with two industry leaders so they can confidently and efficiently transition into intelligent enterprises."

"SAP's decision to select Microsoft Azure as its preferred partner deepens the relationship between our two companies in a differentiated way and signals a shared commitment to fostering the growth of the cloud ecosystem," said Judson Althoff, executive vice president, Worldwide Commercial Business, Microsoft. "Today's news also reflects our commitment to a customer-first mindset and supporting their cloud transformation, which continues to drive how we at Microsoft approach everything from partnerships to product innovation. It takes co-selling to a whole new level." SAP will lead with Microsoft Azure to move on-premise SAP ERP and SAP S/4HANA customers to the cloud through industry-specific best practices, reference architectures and cloud-delivered services. This includes future deployment and migration of existing direct SAP HANA® Enterprise Cloud customers leveraging hyperscaler infrastructure. However, SAP continues with its longstanding policy of supporting choice for those customers who request alternatives based on business requirements. Specifically, project "Embrace" on Microsoft Azure will provide customers with:

A simplified move from on-premise editions of SAP ERP to SAP S/4HANA for customers with integrated product and industry solutions. Industry market bundles will create a road map to the cloud for customers in focused industries, with a singular reference architecture and path to streamline implementation.

Collaborative support model for simplified resolution. In response to customer feedback, a combined support model for Azure and SAP Cloud Platform will help ease migration and improve communication. Jointly developed market journeys to support customer needs. Designed in collaboration with SAP, Microsoft and system integrator partners will provide road maps to the digital enterprise with recommended solutions and reference architectures for customers. These offer a harmonized approach by industry for products, services and practices across Microsoft, SAP and system integrators.

Mobily Reports a Net Profit of SAR156m in 9M19

Saudi Arabian mobile network operator (MNO) Etihad Etisalat (Mobily) has published its financial results for the nine months ended 30 September 2019, reporting a 14.2% year-on-year increase in revenues to SAR9.936 billion (USD2.64 billion), up from SAR8.703 billion in 9M 2018. The positive result was due to the continued growth of its subscriber base and improvement of customer mix, coupled with increased growth in data, business and fiber-to-the-home (FTTH) revenues. Further, EBITDA increased to SAR3.770 billion in 9M 2019, up by 18.2% y-o-y, while interest and financial charges increased from SAR585 million to SAR635 million in the period under review, mainly as a result of the implementation of the IFRS16 reporting standard, and an increase in the cost of funding. Net profit, meanwhile, improved to SAR156 million in the nine months ended 30 September 2019, compared to a net loss of SAR203 million in 9M18.

Nokia Enhances Fixed Wireless Access Portfolio with More Options for 4G and 5G Deployments

Nokia introduced several new additions to its Fixed Wireless Access (FWA) portfolio that bring greater flexibility to FWA deployments. Nokia's new FastMile 5G Gateway supports additional 5G bands to increase regional coverage, introduces new features that simplify self-install and integrates Wi-Fi 6 to ensure 5G speeds and low latency are carried to every corner of the home. For those operators looking to maximize their 4G investments, Nokia's new FastMile 4G gateways and receivers deliver many of the same innovative features. With Gigabit speeds becoming a new benchmark for consumers, 5G FWA provides mobile operators with a unique opportunity to capture new revenue while improving their 5G business case with bundled services. For converged operators, 5G FWA represents another tool in the toolkit to deliver massive scale access with a seamless mix of fiber, copper, coax, and 5G RAN technologies to overcome deployment obstacles, reduce costs and accelerate time to market. The new additions to Nokia's Fixed Wireless Access (FWA) portfolio include:

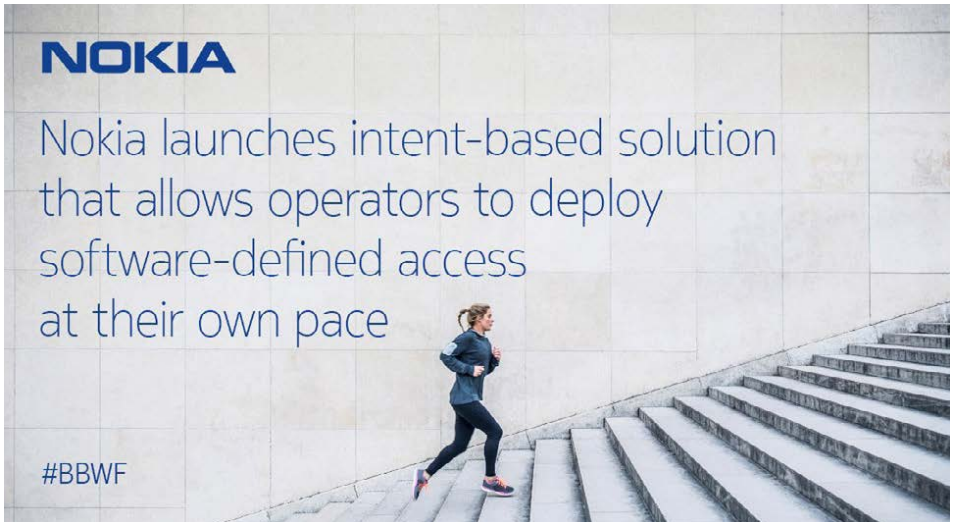
New FastMile 5G Gateway - The enhanced Gateway adds 5G New Radio (NR) bands to support deployments around the globe. It contains a high-gain antenna (11 dBi) to give consumers a stronger signal and more bandwidth. For operators this ensures that higher speeds can be delivered to more subscribers over their Radio Acces Network. Plug-and-play features allow subscribers to install at their convenience, and compatibility with Nokia's in-home WiFi solution ensures a seamless ultra-broadband experience is achieved in every corner of the home. New FastMile 4G Gateway – New FastMile 4G gateways delivers up to 4dBi of gain and compatibility with Nokia's in-home WiFi solution. For areas where signal strengths are weak, new FastMile Multiband receivers feature up to 11dBi of gain. Installation of Nokia outdoor receivers is facilitated with the Nokia Wireless application, which provides step-by-step instructions for installing the device and activating the service. Nokia is trialing its FastMile 5G solution with more than 30 service providers and is starting to deploy the solution around the globe with operators such as Optus. Jeff Heynen, Sr. Research Director, Dell'Oro Group, said: "Fixed wireless access continues to grow globally as both mobile and fixed broadband providers seek to expand the reach of their broadband services. Spectrum band flexibility and higher-gain receivers will be critical components for operators to deploy fixed wireless access services across large portions of their subscriber base." Sandra Motley, President of Fixed Networks at Nokia, said: "5G fixed wireless access is a critical technology complementing our existing fiber, copper and coax access solutions. With our new 5G FastMile gateway, any operator owning spectrum can deliver true fixed-grade gigabit services to homes and businesses."

Nokia and Orange Polska Pilot 5G in Lublin

Orange has launched a 5G pilot in the city of Lublin, Poland, as part of its ongoing network trials in the country. The trial uses 80MHz on the 3.4-3.6GHz frequency band to support data transfer speeds of up to 800Mbps. Orange will use 5G smartphones in the trial, alongside Nokia's 5G radio access technology and FastMile 5G Gateways for Fixed Wireless Access. Last month, Orange launched its first 5G pilot in Poland in Warsaw, using kit from Ericsson. Jean-François Fallacher, President of Orange Polska, said, "We have been working on building Polish 5G for over a year now to choose the optimal solution for our customers and the development of the mobile network. Tests with various suppliers give us priceless experience. "They also confirm that we are technologically ready to launch this next-generation network and show what opportunities it will give to Poles and the Polish economy in the future. I am glad that the trials take place in Lublin, a city focused on development with modern technologies." Krzysztof Żuk, Mayor of Lublin, commented, "Lublin is a friendly place for new technologies. The city has a thriving IT sector focused in the Lublin IT Highland ecosystem. We are also an important academic center. We have been implementing solutions for years to make Lublin smart, and thus more attractive to investors. "We want to meet the needs and ambitions of our citizens. In this way, we are building modern Lublin step by step, and 5G tests carried out by Orange and Nokia confirm our potential as a smart city."

Nokia Launches Intent-Based Solution that Allows Operators to Deploy Software-Defined Access at their Own Pace

Nokia unveiled the industry's first fully integrated intent-based solution that completely changes how operators build fixed access networks to deliver ultra-broadband services. With Nokia's new intent-based Altiplano Access Controller operators will be able to flexibly move toward software-defined access and gain more intuitive and automated control to deliver a gigabit experience to users everywhere. In the race to deliver a better broadband experience, operators are upgrading their access networks and introducing new technologies like 5G Fixed Wireless Access. However, with each upgrade come additional service management and operational complexity, which limit an operator's ability to quickly introduce new services. Software-defined access networks (SDAN) can help by creating an open programmable network that is easier to adapt, automate and expand. Intent-based networking (IBN) further enhances the benefits of SDAN and serves as the next evolutionary step toward a fully autonomous network. Supporting both traditional and SDAN nodes, it allows operators to manage service availability from a business perspective instead of at the technology level. With Nokia's intent-based Altiplano Access Controller, operators can simply define the outcome they want to achieve in terms of a service definition or SLA, and the network will automatically configure to support it across any technology environment. It also makes it easier to configure and provision networks with self-adjusting capabilities that continuously monitor the state of the network against intents and execute changes as necessary across the network. While the benefits of SDAN and intent-based networking are significant, operators typically have extensive network investments that simply can't be replaced or upgraded at once. To avoid stranding existing systems and disrupting business, operators need the flexibility to add SDAN in incremental steps. Nokia supports this stepped approach with a toolkit of services and solutions that help operators build, integrate and operate software-defined access at their own pace. This includes: Cloud design and OpEx modeling with Nokia's unique end-to-end expertise to ensure the highest gains in performance, scalability and agility. Operators can analyze the impact on operations and save 25-40% in management tasks. Quick-start solutions that help operators bring SDAN into the lab, conduct trials or start a deployment with minimal OSS impact and faster time-to-service. Support for legacy with SDAN integrating easily into existing IT systems via a rich choice of protocols. Combined with a unique service to seamlessly migrate Nokia ISAM nodes to Lightspan, operators get a safe and efficient evolution path. OSS and system integration services that help reduce the risk, cost and time it takes to build, integrate and operate software-defined access. Enabling operators to incrementally move toward a more intelligent and automated network, the toolkit builds on Nokia's extensive network migration experience that includes more than 65 ultra-broadband transformation customers with 99% first-time-right success. Ray Owen, CTO at nbn, said: "As a long-standing strategic partner for nbn, Nokia continues to play a key role in helping us evolve our network to meet our broadband access goals. Nokia's cutting-edge SDAN technology allows us to manage the various G.fast deployments we have across the nbn FTTC network. It also gives us the flexibility to enhance the customer experience management and advance our own operations systems with integration into the Nokia SDAN open environment." Sandra Motley, President of Fixed Networks at Nokia, said: "Innovative intent-based solutions like our Altiplano Access Controller are changing the game for how operators deliver services over their network. No longer confined by their underlying infrastructure, operators can now create a service with the assurance of knowing the network will automatically configure and adapt to support what's needed."



Telia Finland Contracts Nokia for 5G FWA Solution

Nokia has announced a deal with Telia Company under which it will bring its 5G Fixed Wireless Access (FWA) solution to customers of the latter's Finnish subsidiary. According to the vendor, its FastMile 5G gateway will allow Telia Finland to unlock the full potential of its 5G mobile network and quickly extend new ultra-broadband services to residences countrywide. Telia Finland customers that subscribe to the operator's enhanced next-gen service can reportedly already pick up a Nokia FastMile

5G gateway in select stores with a view to gaining 'immediate access to gigabit peak speeds in their home'. Nokia's FastMile 5G gateway forms part of Telia Finland's 5G device and subscription launch in Finland and is currently available to customers in Helsinki, Vantaa and Oulu, with plans to expand to 'other major cities' in future. Janne Koistinen, 5G Program Manager for Telia Finland, said: 'We want customers to enjoy the benefits of 5G regardless of where they are, and Nokia is an important partner helping us achieve this. With Fixed Wireless Access solutions like Nokia's Fastmile 5G Gateway, our customer will be able to quickly leverage our end-to-end 5G network and enhanced services to support all of their ultra-broadband needs in the home.'

Nokia Secures KDDI 5G Deal

KDDI Corporation, a leading telecoms company in Japan, has selected Nokia as a primary partner to upgrade its 4G network to 5G with Nokia's industry-leading radio access solution AirScale, which supports both 4G and 5G operations. This will allow KDDI to modernize its 4G network and meet the growing consumer and industrial demands for 5G. The contract for 5G radio re-enforces the strong relationship between the two companies, which dates back over two decades. Nokia is an existing supplier to KDDI across multiple technologies, including radio, fixed networks, mobile core network and multiple software solutions. The 5G network will support KDDI across both cmWave and mmWave 5G frequency bands and can be deployed in both distributed and centralized architectures. The network will be deployed across Japan and will deliver enhanced Mobile Broadband (eMBB) to consumers and enhanced Machine Type Communication (eMTC) enabling multiple new applications and services for industries in the 5G era. The network architecture will also be transformed to enable 5G Ultra Reliable Low Latency Connectivity (URLLC). John Harrington, Head of Nokia Japan, said: "This deal will allow KDDI to get ready for the 5G era and we are honored and excited to continue our long-term relationship. As an end-to-end supplier of multiple technologies to KDDI, we look forward to transforming the network and launching 5G for consumers and industries." Nokia currently has 48 global 5G commercial contracts, including live networks in the US, Latin America, Europe, Korea and Australia. Our track record of providing the world's best performing 4G networks*, reflects well in our 5G commercial success. In fact, all our LTE customers that announced 5G plans have continued with us, showing their faith in the power of Nokia's end-to-end portfolio.

Nokia Celebrates Twelve Months of 5G Achievements

Nokia is celebrating twelve months of 5G 'firsts': a milestone defined by 23 game-changing achievements in the field of 5G. Over a twelve-month period that started on 6 September 2018 with the first over-the-air, end-to-end data transmission on a commercial 3GPP 5G New Radio network in partnership with Verizon, Nokia has gone forward to achieve an additional 22 5G firsts in six continents and in a wide range of technology areas. In addition, as North America is thus far the world's largest 5G market, Nokia has positioned itself as the leading vendor with the largest 5G population coverage footprint. Chief among the achievements in the past 12 months are six world firsts in 5G secured by Nokia's technology and its people, including:

- The first environment for verification to develop the connected car using 5G, enabled by Nokia's 3GPP-standard base stations for Softbank
- The first tests into new aspects of the 5G standard in real-world industrial conditions at the Port of Hamburg in Germany, together with the Hamburg Port Authority and Deutsche Telekom

The first over-the-air 5G data transmission using 2.5 GHz and massive MIMO antenna technology, on Sprint's live commercial network in San Diego, together with Qualcomm Technologies, Inc. and Sprint

Nokia has also helped to power seven technology firsts in 5G, which along with the September 2018 Verizon trial include:

- The first 8K Ultra High Definition TV streaming in real conditions

over 5G, delivered in partnership with France Télévisions
- The first cloud-based VR gaming on an AI-powered 5G network using open RAN architecture to manage the extreme network demands of immersive real-time VR gaming, after teaming up with CMCC
- The first 5G solution for one of the world's largest events, the Hajj in Saudi Arabia, using VR to allow visitors to experience Hajj remotely as if they are present on site
- Nokia, together with its partners and customers, have also achieved 10 regional firsts in 5G, including:
- The first outdoor pilot of 5G New Radio on 3.5GHz frequency band in Singapore, in partnership with StarHub
- The first nationwide 5G coverage in Europe by, together with TIM, providing full coverage of the entire Republic of San Marino
- The first 5G deals in South Africa, with rain; in Latin America, with ANTEL in Uruguay; and most recently in New Zealand, with Vodafone New Zealand

Marcus Weldon, Nokia's Corporate CTO and President of Nokia Bell Labs, said: "The past 12 months of Nokia's 5G milestones and successes stem from our years of research into 5G and the resulting innovative technologies are changing the world for consumers and industries. "Whether enabling new geographies to experience the possibilities of 5G for the first time, pushing technology to define new limits and deliver groundbreaking performance, or achieving 5G firsts never before seen, Nokia's end-to-end portfolio is helping customers redefine what's possible, as the true potential of 5G starts to take hold." Nokia Bell Labs pioneered many of the fundamental technology innovations that are being adopted into 5G standards. Inventions in Low Density parity check (LDPC), 5G radio stack design, Massive MIMO, Mobile Edge Computing, and millimeter Wave have enabled 5G Release 15, and new innovations in 5G unlicensed spectrum and Industrial IoT are leading the digital transformation to industrial automation and Industry 4.0. In addition, Nokia has played a key leadership role in driving the first set of globally interoperable 5G standards through its contribution to the 3GPP standards organization.

Jawwal Leading Local Market on Social Media

Jawwal launches its new customer care services platform over Telegram adding it to other social media platforms launched previously on Whatsapp, facebook Messenger, Viber, Skype, Instagram and Snapchat; aiming to reach out for its customer base at all times and locations. For the past 20 years, Jawwal was a pioneer in utilizing new technologies to serve its customers, offering them the best commercial offers and listen to their feedback. With today's technology and vast use of social media, Jawwal is leading the telecom market in Palestine by introducing innovative solutions to further enhance corporate brand image and customer care services.

PCCW Global Named as Supplier on Crown Commercial Service Education Technology Framework

PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, is pleased to announce that it has been named as a supplier on the Crown Commercial Service (CCS) Education Technology framework to provide broadband fiber infrastructure and broadband services to all public sector educational organizations in the United Kingdom following a rigorous tender process. Under the agreement, PCCW Global will be able to provision the design and installation of broadband fibre infrastructure, provision the fibre to the premises, testing of fibre, and "last mile" installation. PCCW Global is also approved to provide connectivity services including the supply of full fibre broadband services (new services/upgrades of existing), support and maintenance, Internet filtering, firewall, e-Safety and IP connectivity. This agreement, which runs until June 2022, assures that PCCW Global's services are now available to all public sector educational organizations including schools, academies, colleges, universities and other educational establishments in the United Kingdom. Inclusion as a supplier in the Education Technology framework is an exciting opportunity for the company to deliver its wide array of high-quality communication services into this key sector. Crown Commercial Service supports the public sector in seeking to achieve maximum commercial value when procuring common goods and services. In 2018/19, CCS helped the public sector to achieve commercial benefits worth £945 million - supporting world-class public services that offer best value for taxpayers. Ms. Paula Benoit, Chief Executive Officer of PCCW Global Networks (UK) Limited, said,

"PCCW Global has significant experience in providing both full fiber infrastructure and broadband services to both business and end users across the United Kingdom. Optify Smart Fibre Infrastructure has already been deployed at a number of sites, delivering ultrafast broadband to users as well as providing the foundation for a growing range of smart building technology." Education is changing rapidly, but many institutions still seek high-quality and cost-effective connectivity. With services increasingly delivered online and students themselves required to use connected devices in the classroom, it is imperative to deliver new services and improve the educational experience to these areas. There is also a growing demand in the education sector for technology to increase efficiency, to save not only operating costs but also to improve a building's environmental credentials. The CCS framework provides a way for providers to deliver these

services, enabling cost effective and efficient procurement decisions to be made. Being a named supplier, PCCW Global is now perfectly placed to deliver new and revolutionary technologies into this sector.

PCCW Global's SDI Platform and NAVER Business Platform Collaborate to Deliver On-Demand, Private Global Connectivity and Cloud to Korean and Global MNCs

PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, and NAVER Business Platform (NBP), the leading IT Infrastructure and cloud services provider in South Korea providing a broad spectrum of IT services and public cloud services via the NAVER CLOUD PLATFORM, today announced a bilateral interconnect collaboration to provide South Korean and multi-national enterprises direct, on-demand connections to the NAVER Business Platform with PCCW Global's Console Connect Software-Defined Interconnection® (SDI®) platform. Console Connect can provide NBP customers with fast, low-latency and secure direct connectivity delivered over PCCW Global's MPLS network. NBP is South Korea's leading IT and cloud service provider with global data centers and cloud services in six countries around the world spanning Asia, Europe and the Americas. NBP is the cloud and IT infrastructure subsidiary of NAVER Corporation (market capitalization of US$16.2B). NAVER Corporation is a global ICT that runs South Korea's largest web search engine and manages global mobile services such as LINE Messenger. Through collaboration and interconnection with Console Connect, NBP customers are now able to provision fast, private, low latency connections on-demand to access their business-critical applications, and can connect their global customer networks in seconds. The simple-to-use automation software eliminates the complexity of network configuration and delivers enhanced performance, visibility, monitoring, and security. Console Connect delivers an easy and affordable way to connect to cloud-based applications, partners, IT infrastructure and the world's major cloud hosting services. The platform spans over 37 countries and interconnects over 120 data centers, leveraging the worldwide PCCW Global MPLS network, which is physically separate to the public Internet and features an uncontended, highly resilient and redundant core network with multiple low-latency paths between countries. To support the growing trend for multi-cloud and hybrid cloud deployments, customers are also able to use the platform and PCCW Global's network to implement on-demand connectivity between global data centers and all other major cloud on-ramp partners, including AWS Direct Connect, Microsoft Azure, IBM Cloud, Oracle Cloud, Google Cloud, Alibaba Cloud and Tencent Cloud. Mr. Michael Glynn, PCCW Global's Vice President of Digital Automated Innovation, said, "NAVER Business Platform has an extensive portfolio of cloud services and a growing international business. We are very excited to work together to jointly deliver a superior cloud networking experience on our global SDI® platform. Once established on our ecosystem it will expand NAVER CLOUD PLATFORM not only locally in our multi-presence data centers in Seoul but to over 37 countries on our platform. We are running one of the largest on-demand, self-provisioning software-defined interconnection platforms in the world and have over 22TB of fiber capacity globally which is a key benefit to any NAVER CLOUD PLATFORM customer that is looking for low latency, resilient, secure, instant connections back into the NAVER CLOUD PLATFORM." Mr. KwangPyo Hong, Head of Global Business, NAVER Business Platform, said, "Console Connect by PCCW Global enables NAVER Business Platform to further upgrade the global business of NAVER CLOUD PLATFORM. As multi-cloud has been gaining great momentum, reliable and convenient network connectivity with global data centers is becoming an essential element of cloud services. NAVER Business Platform will continue to expand its service to meet diverse needs of customers from all over the world."

SES Announced Year to Date Results

SES S.A. announced its financial results for the nine months ended 30 September 2019 with financial performance continuing to be in line with SES' expectations; sequential growth in quarterly revenue and EBITDA and financial outlook unchanged. Steve Collar, CEO, commented: "For the seventh consecutive quarter, our results are in line with our expectations and with the outlook that we have given to the market, reflecting our on-going focus on execution in the core of our business. As expected, we are seeing revenue and EBITDA expansion flowing through in the second half of 2019 with strong control over costs and discretionary spending and the continued rationalization and simplification of our business and organization. Execution remains the focus for the rest of the year as we look to close out 2019 with a strong Q4 outturn, much as we did in 2018 and implied in our financial outlook which remains unchanged. In Video, we completed the combination of our infrastructure and services capabilities; launched a dedicated TV platform in Ethiopia; secured important renewals in our core neighborhoods; and introduced new products, such as a Satellite/OTT synchronization capability, managed cloud playout through our partnership with Microsoft Azure and the further development of our in-house orchestration platform SES 360. Our Networks business continues to grow with recent customer successes including important incremental business on SES-15 in support of our aero service provider customers; important business aviation partnerships with Collins Aerospace and Vista Global; our Signature Maritime Solutions now enabling connectivity in the Mediterranean; and deploying 'life-changing' broadband services that will allow our partners to improve connectivity in rural areas across Indonesia and Colombia. I am excited by the progress that we are making with O3b mPOWER and our vision for a connected, seamless, cloud-scale MEO/GEO network. We are through the critical design phase for O3b mPOWER and have secured the launch of the first seven satellites with SpaceX for 2021. Importantly, we have partnered with Microsoft to extend Azure ExpressRoute services globally across our network, with our combined customers benefiting from the reach and performance of the SES network. All of this will be enabled by an automation and orchestration platform based on Open Network Automation Platform (ONAP) in partnership with Amdocs and leveraging our in-house Adaptive Resource Control (ARC) under development with Kythera to deliver unprecedented levels of flexibility and network efficiency. All of which will make it easy for our customers to get the very best service, delivered when and where they want it, at the right economics and with an unprecedented array of service offerings and enablement. This was underscored with the recent announcement that, together with Thales Avionics, we have successfully completed seamless and uninterrupted multi-orbit inflight interoperability demonstrations, paving the way for our MEO network to enhance and disrupt aviation services much as it has in cruise. Finally, the FCC Chairman has reiterated his belief that there will be 'results to show in the Fall' from the ongoing proceeding to repurpose C-Band to support the rapid and broad-based roll out of 5G services in the U.S. while protecting the 120 million TV and radio households who rely on the networks that our customers support. The C-Band Alliance is engaged proactively with all stakeholders in the U.S. to ensure that our proposal delivers a fair deal for all.

Blake Broadcasting Selects SES for satBroadcasting™ Services

BBN (Blake Broadcasting) has executed a 3-year+ deal with SES as its exclusive broadcast Satellite Network Provider for CBNN Networks in Europe, Asia and North America. CBNN is a growing network of cable (linear television) properties and OTT Networks that reaches more than 400 million homes. SES works with the world's largest live sports, news and event organizations, and takes care of the distribution networks, playout workflows, content management and monetization services and all backend services in order for CBNN to focus on delivering the highest quality content to their audiences worldwide. Bob Blake, CEO of Blake Broadcasting and a founder of CBNN, stated that Oak Park Capital and several news networks are very pleased to work with SES as they are the premiere broadcast satellite provider in the world. The company is especially honored to be a selected broadcaster on the Astra 1M or 19.2 E satellite — broadcast operations in Europe will be based out of Luxembourg and SES will also manage the firm's satellite broadcasts throughout Asia and North America as well as the company's linear television expansion plans throughout 2020. In addition, MX1 (now merged into SES) will manage overall channel content distribution, management, playout and monetization integration. That organization's exceptional level of service will allow CBNN to primarily concentrate on providing the highest quality news, sports, e-sports and entertainment content for the firm's channels.

UEFA Champions League and Europa League Matches Broadcast Live in HD Across Indonesia

Football fans in Indonesia are now able to watch their favorite European teams compete in the UEFA Champions League (UCL) and UEFA Europa League (UEF) live on TV screens in high-definition (HD) format due to a new partnership formed by media group Surya Citra Media (SCM), satellite direct-to-home TV provider Nex Parabola and the world leading satellite operator SES. SCM has secured the exclusive broadcast rights for the 2019/20 football seasons of UCL and UEL which will be delivered to Nex Parabola customers via the SES-9 satellite, SES announced today. The two European football channels will be packaged together with exclusive content from SCM Group. These new channels include Citra Cinema, Citra Drama Plus, Citra Muslim and Citra Dangdut, providing a variety of lifestyle, entertainment and religious content for Nex Parabola customers. SES-9 is co-located at 108.2 degrees East orbital position with SES-7 and provides prime coverage over all 17,000 islands in Indonesia, as well as locations in South Asia, Northeast Asia, Australia and the Middle East. The 108.2 degrees East neighborhood is targeted for video services and ensures extensive coverage over all corners of the country for SES-9. This, coupled with SES-9's high-powered wide beam design, makes the satellite ideal for local broadcast services. "Having recently secured the exclusive broadcast rights for the UEFA Champions League and Europa League in Indonesia, we want to bring the best European football entertainment to as many fans as possible through our subsidiary Nex Parabola and satellite partner SES. With SES-9, we are able to maximize our reach and deliver an unparalleled viewing experience in premium HD format to audiences across the country, whether they are watching us on their home TVs or at the neighborhood warung," said Junus Koswara, President Director of Nex Parabola. "Our partnership with Nex Parabola is testament to our satellite fleet's capabilities of delivering prime international content to viewers around the globe in the best quality possible, wherever they are. We are pleased to help Nex Parabola expand their audience reach using satellite in the most cost-effective manner, and remain committed to delivering satellite services for broadcasters, content providers and companies across the country," said Yew Weng Soo, Vice President, Sales & Market Development, Asia Pacific of SES Video.

Ethiopia Welcomes First Dedicated TV Platform

For years, Ethiopian TV viewers have had to navigate through a plethora of multinational content in a variety of foreign languages in order to locate their favorite channels. That changes today with the launch of Ethiosat – the first-ever dedicated Ethiopian TV platform to host Ethiopia's most popular local channels. This has been made possible by agreements between the Association of Ethiopian Broadcasters (AEB), the Ethiopian Broadcasting Corporation (EBC), and the world's leading satellite operator, SES. Ethiosat is hosted on SES's NSS-12 satellite at 57 degrees East and delivers over 30 channels for Ethiopian audiences only, with 12 of those channels already in High Definition (HD) quality. Amman Fissehazion, Chairman of the AEB, said, "Up until now, the majority of Ethiopia's content has been broadcast from an orbital location that also supplies content to Middle Eastern and North African countries, which explains the often confusing mix of content. By migrating the most popular Ethiopian TV channels to a new location on SES's satellite, we've created an Ethiopian-only TV offering that also delivers a variety of channels in HD, a first in Ethiopia." Fissehazion added that this is also a great time for the millions of homes in Ethiopia that currently do not receive TV services to bring TV sets into their home. "For Ethiopians looking to buy a new TV set and receive content from the dedicated TV neighborhood, we recommend purchasing an HD TV whenever possible, as this will allow for a higher picture quality." In addition, the launch of Ethiosat will offer Ethiopians a larger offering of both local and relevant international content in the future. Fissehazion said, "We believe consolidating all Ethiopian TV channels and broadcasting them from one orbital position will fuel growth in the Ethiopian media sector, as local networks will now be able to easily expand their audience reach. This will foster healthy and growing advertising markets, which will result in a greater variety of content, and more localized content." To access Ethiosat

direct-to-home (DTH), Ethiopian TV viewers must have their respective local satellite antenna installer change the position of their antenna. This will allow them to receive the content from SES's NSS-12 satellite. "SES is supporting every aspect of this launch and providing on-the-ground services to ensure the success of Ethiosat, which includes training local installers to correctly repoint the satellite dishes of each TV household to ensure a seamless migration. Ethiosat is bringing a completely new television experience to Ethiopians. We intend for the reliability and quality of the new platform to attract many new viewers, fuelling a bright future for the Ethiopian media sector," said Ferdinand Kayser, CEO of SES Video

Kartina TV Expands Reach Via SES Satellite at 19.2 Degrees East

Over-the-Top (OTT) platform Kartina TV will be broadcasting the tailored bouquet of Russian-language TV channels across Western Europe as they aim to increase the number of viewers watching their content, SES announced today. The content, which soon will be available on a new FTV (Free-to-View) encrypted DTH platform on ASTRA 1N satellite at 19.2 degrees East, will continue to be available over IP networks. One of the leading pay TV operators in Europe and the US for Russian-language programming, Kartina TV caters to the Russian-speaking diaspora who can access Russian-language content via OTT set-up boxes and apps. "As OTT content providers, we want to be delivering content to everyone, but there are limitations when it comes to terrestrial networks. By combining our offering with satellite, we will be able to broadcast channels for viewers who have limited broadband connectivity, and open up a new market for Kartina," said Oleg Jecov, Head of Satellite Project of Kartina TV. Håkan Sjödin, Vice President, Sales Nordic, Baltic and Eastern Europe of SES Video, said, "At SES, we increasingly see how OTT players are keen to expand their markets by leveraging the superpower of satellite – reach. This deal with Kartina TV is an example of that, and sets a new standard for OTT platforms in expanding the reach, viewership and value of multi-genre content. Given SES's leading satellite broadcasting position in Europe, we are in a unique position to support Kartina TV with its new strategy to work with satellite distribution to expand their business by offering multi-genre, free-to-view Russian package in Europe via satellite." The new Kartina Satellite Verimatrix encrypted FTV platform will carry around 30-40 SD Channels in HEVC encoding and is available for users who have a dedicated 4K / UHD HDR Android based hybrid cardless STB with categorized lists of FTA channels and extended EPG support.

SES, Thales Achieve Record IFC Speeds

SES and Thales reached a new record for In-Flight Connectivity (IFC) speeds. The companies demonstrated uninterrupted access to high-throughput broadband applications for the first time over a platform supporting multi-orbit interoperability, switching between SES's Geostationary Orbit (GEO) and O3b Medium-Earth Orbit (MEO) satellite beams. The demo flight from Melbourne, Florida to the Atlantic coast of Nicaragua saw dozens of switches successfully completed between GEO and MEO beams, and between multiple MEO satellites within a beam, using the Hughes Jupiter system. Engineers aboard the test flight were able to simultaneously use a range of services demonstrating rates in excess of 265 Mbps via the Thales FlytLIVE connectivity network featuring the Hughes Jupiter System and a Hughes ModMan integrated with the ThinKom Ka2517 phased-array airborne antenna. The engineers were able to demonstrate reliable delivery of 4K video streaming, social media networking, e-commerce transactions, audio conferencing, interactive gaming, and web browsing on-board the Gulfstream G-III aircraft. "The world's first low-latency, high performance broadband aero experience is closer than ever before with this tremendously successful demonstration of MEO and GEO interoperability. Driving scale and performance into our customers' networks is fundamental in delivering the best passenger experience in the skies. Our cruise customers have long experienced the benefits of the combined power that low latency MEO- and GEO-based connectivity brings to network performance and resilience. This innovation is now on its way for connected commercial and business air travel," said Steve Collar, CEO of SES. "We are gearing ourselves up for the launch of O3b mPOWER and now, with a demonstrated ability to roam seamlessly across our GEO and MEO networks, our customers will enjoy unprecedented speed and performance from our O3b constellation, while also benefiting from the scale and reach of our GEO fleet."

ThinKom Successfully Demos Ka-Band Antenna Connectivity on SES O3b Satellites

ThinKom Solutions, Inc. has completed a series of successful in-flight connectivity tests of its Ka-band antenna on SES' O3b MEO and GEO satellites. The tests provided the first live demonstration of airborne communication with the O3b MEO satellites and included seamless handovers between MEO and GEO satellites during flight. The in-flight demos used the Thales FlytLIVE connectivity network and incorporated the Hughes JUPITER™ ModMan integrated to the ThinKom Ka2517 antenna. The flights took place September 17-18 over South Florida and the Caribbean Sea using a commercially available ThinKom Ka2517 phased-array airborne antenna mounted on a Gulfstream G-III test aircraft. With the Hughes JUPITER Aeronautical system and ModMan, the antenna demonstrated the ability to achieve high data throughput rates while seamlessly switching among successive O3b MEO satellites, as well as transfers between O3b and SES' GEO constellations. The Ka2517 achieved downlink error-free data throughput rates in excess of 265Mbps, with beam switching speeds of less than one second, while automatically resolving adjacent satellite interference (ASI) issues. Based on ThinKom's patented phased-array VICTS technology, the Ka2517 is an airborne antenna designed to communicate through satellites in low, medium and geostationary orbits. The low-profile antenna radome provides near-zero aeronautical drag in flight and supports global coverage including polar and equatorial latitudes. The field-proven Ka2517 is currently in commercial production, and units are in operational service on U.S. government aircraft. SES' high-throughput O3b MEO constellation has positively impacted millions of people with low-latency, high-performance data connectivity services and has enabled SES Networks, SES' business unit focused on data solutions, to offer more capacity, enhanced coverage, increased efficiencies and greater flexibility to its customers. ThinKom CTO Bill Milroy said this is the first in-flight demonstration of an aeronautical antenna communicating across a MEO-GEO hybrid satellite network. The Ka2517 with the JUPITER ModMan met or exceeded all test parameters for spectral efficiency, data throughput, beam agility, switching speeds, ASI mitigation, low-angle performance and inter-constellation roaming. The demonstration further establishes that ThinKom has the only proven 'no compromise antenna solutions that can support seamless global satellite communication in the air with automatic roaming among GEO, LEO and MEO constellations. Reza Rasoulian, VP, Hughes Network Systems, LLC (HUGHES), added that the test by ThinKom underscores the effectiveness of the Hughes JUPITER System for both MEO and GEO connectivity, and, when combined with a high-quality antenna such as the ThinKom Ka2517, to deliver superior spectral efficiency, link availability and performance. Elias Zaccack, EVP, Global Sales, at SES Networks, noted that these successful demo tests are raising the bar for in-flight connectivity and the connected passenger experience. The seamless integration of our MEO and GEO satellite networks will provide SES customers with unprecedented redundancy, higher connectivity speeds and a whole new level of operational models. The company is excited to have achieved this milestone together with long-term partner Thales, as this is yet another example of how mutual collaboration continues to bring innovative connectivity solutions with unmatched performance. Pascal Homsy EVP, Telecommunications Business Line, Thales Alenia Space, commented that these in-flight tests performed together with SES, ThinKom and Hughes are an outstanding demonstration of the seamless connectivity through MEO and GEO satellite systems. Thales Alenia Space was particularly pleased to participate in this worldwide first, using the O3b satellite constellation the company manufactured for SES.

SES Secures Contract with Major Indonesian Media Company

SES has entered into a contract agreement with Indonesian media group Surya Citra Media (SCM), and its satellite direct-to-home TV provider Nex Parabola to provide exclusive HD coverage of the UEFA Champions League and UEFA Europa League soccer tournaments this season. This will be done via SES's SES 9 satellite. The two European football channels will be packaged together with exclusive content from SCM Group. These new channels include Citra Cinema, Citra Drama Plus, Citra Muslim and Citra Dangdut, providing a variety of lifestyle, entertainment and religious content for Nex Parabola customers. SES-9 is co-located at 108.2 degrees East orbital position with SES-7 and provides prime coverage over all 17,000 islands in Indonesia, as well as locations in South Asia, Northeast Asia, Australia and the Middle East. The 108.2 degrees East neighborhood is targeted for video services and ensures extensive coverage over all corners of the country for SES-9. This, coupled with SES-9's high-powered wide beam design, makes the satellite ideal for local broadcast services.

Tech Mahindra and Department of Urban Planning & Municipalities (DPM), Abu Dhabi, Launch Blockchain Solution for Land Registry

Tech Mahindra Ltd. a leading provider of digital transformation, consulting and business reengineering services and solutions, has announced today a partnership with the Department of Urban Planning and Municipalities (DPM), a leading UAE Government entity to launch a Blockchain solution for Land Registry using SmartHub Application. The solution will enhance citizen services by increasing transparency and traceability of records, security, and ensuring easy archival of data. The solution will enable digital transformation of land registry – it will decrease the processing time related to Land Registry related transactions and create value which can bring benefits to citizens and multiple entities associated with municipalities (like property developers, banks). Speaking on the occasion, on behalf of Department of Urban Planning and Municipalities, Ahmad Abdolsamad AlHammadi - CIO Abu Dhabi Municipality, said, "The government and private sectors in Abu Dhabi are working together to achieve the digital transformation agenda led by the government. We believe in proactively embracing new age technologies and delivering better citizen experiences to the residents of Abu Dhabi. The implementation of next gen technologies like Blockchain and SmartHub digital services will help serving a wider segment of citizens enhancing customer happiness, quality of life and accessibility of our services. This is a beginning of many more services that we plan to roll out during the course of the year." All the property related documents issued by the municipalities will be stored in Blockchain and can be tracked through Blockchain nods extended to different entities. SmartHub application using Blockchain will also provide benefits in services like Buying Resale Property and Tenancy Contract Verification etc. Ram Ramachandran, General Manager and Head of Middle East & Africa, Tech Mahindra, said, "We are delighted to be a strategic digital and technology partner to Department of Urban Planning & Municipalities (DPM) in the journey towards enhanced government to citizen experience. The Blockchain program for Land Registry demonstrates the progressive nature of the Abu Dhabi government. Tech Mahindra is committed to enable its customers in digital transformation roadmap, build and deliver of cutting-edge technology solutions and services that address real world problems and meet customer's evolving and dynamic needs." As part of the TechMNxt charter, Tech Mahindra is focused on building an ecosystem that supports collaboration in the real sense and provides enhanced experience to customers globally be leveraging next generation technologies. As a step in this direction, Tech Mahindra has collaborated with some of the finest start-ups, working with academia, drawing from the millennial workforce, and jointly creating cutting-edge technology solutions with partners.

Tech Mahindra Business Process Arm Recognized as a 'Leader' in NelsonHall 2019 NEAT Evaluation

Tech Mahindra, a leading provider of digital transformation, consulting and business re-engineering services and solutions announced that its Business Process Outsourcing arm has been recognized as a 'Leader' for its Customer Experience (CX) services in Retail and Consumer Packaged Goods (CPG) industry by NelsonHall's 2019 NEAT (NelsonHall Vendor Evaluation and Assessment Tool). NelsonHall, the leading global IT (Information Technology) and business process services research and analysis firm, has particularly acknowledged Tech Mahindra BPS for its experience in personalization and customization with retail clients, investments in customer-facing automation through strategic partnership and IP (Intellectual Property), dedicated analytics models, and significant experience in seasonal and peak support with multishore examples. Ivan Kotzev, Lead CX Services Analyst with NelsonHall, said, "Tech Mahindra Business Process Services' proactive service management, investments in self-service, and experience in delivering personalized interactions are well suited for retail and CPG clients. Retail and CPG companies have no choice but to rapidly advance their digital CX through the adoption of real-time analytics and intelligent automation". Tech Mahindra BPS has been recognized as a 'Leader' in two out of three key market segments of the NEAT Evaluation – "CX Improvement Focus" and "Cost Optimization Focus". It

has been identified as a 'High Achiever in the "Revenue Generation Focus" segment. Ritesh Idnani, President, Business Process Services, Tech Mahindra, said, "Customer experience is a key boardroom priority, and Tech Mahindra has been enabling clients in achieving superior business outcomes through the same. We are happy to be recognized by NelsonHall as a 'Leader' in Customer Experience (CX) services for Retail& CPG, reflecting the significant maturity in our offerings for respective vertical. This is a testament of the digital transformational work done by well-trained and digitally enabled associates, strategic amalgamation of new generation technologies like Analytics, Intelligent Automation and Artificial Intelligence, and a strong partnership ecosystem with leading technology providers." The NelsonHall NEAT helps sourcing managers save time and money while enhancing the quality of their sourcing decisions in business process and IT outsourcing. The NEAT sits

at the front-end of the vendor screening process and consists of a two-axis model: assessing vendors against their "ability to deliver immediate benefit" to buy-side organizations and their "ability to meet future client requirements". Tech Mahindra Business Process Services provides Next Gen Digital CX & Back Office services across multiple industries, which include Communication, Media & Entertainment, Retail & CPG, Healthcare & Life Science, Banking & Financial Services, Transport, Hospitality & Logistics and Manufacturing & Utilities. As part of its TechMNxt charter, Tech Mahindra continues to focus on leveraging next gen technology to provide for customer's evolving and dynamic needs.

Tech Mahindra and InMobi Collaborate to Offer 1st Video Advertising Solution for Mobile Devices

Tech Mahindra Ltd., a leading provider of digital transformation, consulting and business reengineering services and solutions, announced today a collaboration with InMobi, the world's leading mobile-focused Marketing Cloud, to offer the industry's first video advertising solution for mobile for advertisers like telecom providers and media and entertainment companies. The solution will transform mobile video advertising by enabling them to develop and distribute innovative and engaging video advertisements on mobile. The new solution is an addition to the capitalize component of Tech Mahindra's VU platform (Video Unlimited) that caters to 4Cs of content: Create, Curate, Circulate and Capitalize. Through this partnership, organizations will be able to take the video advertisements created at scale with Tech Mahindra and, through InMobi, distribute them to targeted audiences through leading global mobile applications. Manish Vyas, President, Communications, Media & Entertainment Business, Tech Mahindra , said, "As a part of our TechMNxt charter, Tech Mahindra is committed to leverage next generation technologies and solutions to disrupt and enable digital transformation, and to build and deliver cutting-edge technology solutions. Our partnership with InMobi helps us in delivering connected experience to our telecom and media customers through the first of its kind adtech platform." With industry-leading attribution, data analysis and programmatic expertise, InMobi is helping brands drive real connections through in-app environments and video. Through this partnership, Tech Mahindra customers will gain access to exclusive supply through InMobi Exchange, InMobi's in-house programmatic mobile ad exchange, as well as additional supply sources through InMobi's Demand-Side Platform, InMobi DSP. InMobi's commitment to transparency and verifiable measurement through trusted third parties will be available by default to all Tech Mahindra customers working with InMobi. Abhay Singhal, Co-Founder, InMobi Group and CEO, InMobi Marketing Cloud , said, "We are excited to help the world's biggest media and entertainment companies find and reach the right audiences through mobile with Tech Mahindra. InMobi's unique data insights, precise audience segments and expertise in both programmatic and in-app environments will prove to be immensely valuable for Tech Mahindra's customers looking to drive real connections with their consumers through mobile video advertising. Our commitment to full transparency and leading partnerships with third-party measurement and verification companies will help Tech Mahindra's clients have the trust and vision needed to make in-app advertising work well on their terms." As part of the TechMNxt charter, Tech Mahindra is focused on building an ecosystem that supports collaboration in the real sense. As a step in this direction, Tech Mahindra has collaborated with some of the finest businesses, working with academia, drawing from the millennial workforce and jointly creating cutting-edge technology solutions with partners.

Tech Mahindra Collaborates with Netherlands Based Startup

Tech Mahindra Ltd. a leading provider of digital transformation, consulting and business reengineering services and solutions, announced its collaboration with Quantoz, Netherlands-based innovative Blockchain technology application incubator, specialized in building and implementing Blockchain-based solutions, to offer Blockchain-as-a-Service for secure digital payments. This disruptive solution, Quasar, will also enable integration of fiat currency like US Dollar or Euro, and legacy systems. Further, it enables instant, irreversible digital cash payments among enterprises, people and devices in the Internet of Things, compliant with regulations. As a result, devices connected via the internet can autonomously handle payments. Quasar is a distributed, permissioned Blockchain-based electronic cash system with built-in rules to fulfil regulatory and compliance guidelines. Rajesh Dhuddu, Global Practice Leader, Blockchain, Tech Mahindra, said, "As part of our TechMNxt charter, Tech Mahindra is focused on leveraging Blockchain to create disruptive solutions and provide enhanced experience to our customers globally. Our collaboration with Quantoz is a step in that direction, as it will enable our customers, for instance, automotive OEMs (Original Equipment Manufacturers) become a payment gateway, triggering new revenue streams through aftermarket ecosystem." The Quasar solution is already being used for multiple industries like automotive, healthcare, heavy machine manufacturing and telecom. The "Connected Cars" use case on Blockchain gives cars their own wallets for peer-to-peer transaction, creating an intelligent ecosystem of car manufacturers, customers and various service providers. This enables car manufacturers to provide a monetization platform to third party service providers, helping them shift from single revenue car model. Henri de Jong, Quantoz Board Member and responsible for Business Development, said, "The cooperation with Tech Mahindra helps us to further roll out our Quasar technology. We have been working with the Tech Mahindra Blockchain team over the past one and half year on projects in different industries around the world. With the help of this partnership, Quantoz will leverage Tech Mahindra's extensive experience reach and offer Quasar Drive platform as a key tool to drive digital transformation for clients." Tech Mahindra has successfully deployed production grade Quasar Drive at its research and development arm, Makers Lab in India and United States to enable customers to immediately pilot with any connected product. This helps in creating a 'pay per use' model and also convert a CapEx (Capital Expenditure) based implementation into an OpEx (Operational Expenditure) model. Quasar is one of the Blockchain platforms accessible from Tech Mahindra's Blockchain Design Studio - industry's first on cloud interface that showcases 25 Blockchain applications along with 6 Blockchain protocols. The Blockchain Design Studio gives customers, for the first time, an opportunity to experience Blockchain through direct access of Blockchain platforms applications built by Tech Mahindra and industry protocols. As part of the TechMNxt charter, Tech Mahindra is focused on leveraging next generation technologies like Blockchain, 5G, Internet of Things, Artificial Intelligence, Cybersecurity to disrupt and enable digital transformation, and to build and deliver cutting-edge technology solutions and services to address real world problems to meet the customer's evolving and dynamic needs.

Tech Mahindra Launches 5G Enabled Solution to Build Wireless and Secure 'Factory of the Future'

Tech Mahindra Ltd. a leading provider of digital transformation, consulting and business reengineering services and solutions, has announced the launch of a 5G-enabled solution to build wireless and secure 'factory of the future.' It is an end-to-end business and technology solution to enable manufacturers to achieve industry 4.0 goals. The solution, built in partnership with Cisco, a worldwide technology leader, will provide network infrastructure assessment and consultancy services to build 'factory of the future'. Key highlights of the factory infrastructure space include – factory wireless network, factory to enterprise Software Defined network, Cybersecurity, IT-OT (Information Technology – Operation Technology) integration areas. Nilesh Auti, Global Head Manufacturing Industry unit, Tech Mahindra, said, "Factory equipment holds a great deal of meaningful data which is key to any successful Industry 4.0 project. Tech Mahindra's solution in partnership with Cisco, will enable us to leverage this data and empower manufacturers to build factories of the future. As part of our TechMNxt charter we are focused on leveraging 5G technologies to address our customer's evolving and dynamic needs, and enable them to RISETM." Additionally, Tech Mahindra has also launched 'IoT Sandbox', a highly efficient persona based IoT (Internet of Things) solution finder which helps in finding the correct solution required basis the persona across categories from industries such as Industrial manufacturing, process manufacturing, Automotive, Aero, Oil & Gas, Retail and Healthcare among others. The solution catalogue cuts across Industry 4.0 and IoT and has been launched with 40+ use cases in the areas of Industrial IoT.

Tech Mahindra and Government of Bangladesh Sign MoU to Foster Digital Startup Ecosystem Development in Bangladesh

Tech Mahindra, a leading provider of digital transformation, consulting and business reengineering services and solutions, has signed a Memorandum of Understanding (MoU) with Startup Bangladesh to foster the growth of digital startup ecosystem in Bangladesh, by providing guidance and mentoring to the budding entrepreneurs. The MoU was signed in presence of H.E. Sheikh Hasina, Prime Minister of Bangladesh and Shri Piyush Goyal - Minister of Railways and Commerce & Industry, Government of India. As part of the comprehensive growth framework outlined within the MoU, Tech Mahindra will be assisting new-age technology startups in the country, focusing on future technologies like Artificial Intelligence, 5G, Big Data, Cybersecurity, Blockchain, Internet of Things (IoT) and Machine Learning, to leverage digital growth opportunities across its global network. Startup Bangladeshis a concrete initiative by the Government of Bangladesh to create new opportunities, develop technical skills and help realize the vision of Digital Bangladesh. As part of the MoU, Tech Mahindra will extend collaboration opportunities to the innovators of Startup Bangladesh to engage with its research and development arm Makers Lab, which has global footprint including India, US, Europe and Australia. This collaboration will take up initiatives like Ideathons and Hackathons across educational institutions in Bangladesh. This will help generate awareness about digital technologies and inculcate a culture of innovative thinking. For selected tech startups, Tech Mahindra will provide support in leveraging its global expertise in solving problems in Bangladesh. State Minister for ICT (Information and Communication Technology) Division, Zunaid Ahmed Palak who exchanged the MoU on behalf of the Government of Bangladesh, said,"With an eye on Globalization and future growth opportunities, the Government of Bangladesh is committed to establish a national entrepreneurship platform in the country that will help strengthen an innovation economy. We are pleased to extend our association with Tech Mahindra to power the vision of becoming a leading global digital economy." CP Gurnani, MD & CEO, Tech Mahindra, said, "Bangladesh has demonstrated great commitment towards strengthening the digital growth agenda by making requisite investments in developing skills, new technologies and nurturing entrepreneurship. We are delighted to be partnering with Bangladesh in mentoring the local talent to capitalize on the huge growth potential the region has to offer." Sujit Baksi, President, Corporate Affairs & Business Head APAC, Tech Mahindra, said, "Bangladesh is one of the most prominent emerging markets in the Asian region. The thrust by the Government in developing digital technologies, encouraging entrepreneurship and nurturing a digital ecosystem, are all reflective of the country's commitment to translate the vision of "Digital Bangladesh" into a reality. With our deep industry expertise, we at Tech Mahindra are lookingforwardto partner with Startup Bangladesh in their endeavor to leverage digital technologies for sustainable development and growth." He added, "I thank the Bangladesh ICT Ministry and Indian High Commission in Bangladesh for bringing this together." As part of TechMNxt charter, Tech Mahindra aims to leverage its global expertise in the use of cutting-edge digital technologies such as Blockchain, 5G – Telecom of the Future, Artificial Intelligence, Cybersecurity, Automation, Robotics, and Internet of Things to develop solutions that cater to the rapid evolving needs of the citizens in Bangladesh.

HUAWEI OceanStor Dorado

6 OF THE TOP 10 CARRIERS PROCESS THEIR DATA WITH THE WORLD'S *FASTEST* ALL FLASH STORAGE

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ARTICLE

Six Things You Need to Know About Wi-Fi 6

> *With the Internet of Things and the imminent launch of 5G networks driving more connectivity across the region and beyond, Wi-Fi as we know it will simply struggle to cope with the increased demands that will be placed on it. This is where Wi-Fi 6 comes into play.*

We believe that 2019 is going to be the year that Wi-Fi 6 – the next evolution of the omnipresent Wi-Fi – will become a must-have for businesses across the world. With the Internet of Things and the imminent launch of 5G networks driving more connectivity across the region and beyond, Wi-Fi as we know it will simply struggle to cope with the increased demands that will be placed on it. This is where Wi-Fi 6 comes into play. Here are six things you need to know about Wi-Fi 6.

1. **Wi-Fi 6 isn't as new as you'd think.** As a matter of fact, Wi-Fi 6 has been under development since 2014, after the High Efficiency WLAN Study Group determined a need for greater spectrum efficiency in 2013. That led to the creation of project 802.11ax in May of the following year, driven by a standard task group headed by Huawei's Osama Aboul Magd.
2. **Wi-Fi 6 addresses the pain points of its predecessors.** Ever struggled to get a social media post to upload while at a concert or sports event? Had difficulty downloading an email at a big work conference? Areas of high connectivity traffic experience poor Wi-Fi service, and Wi-Fi 6 is specifically designed to improve performance in dense environments. It does so by using spectrum more efficiently, managing interference, and making enhancements to protocols such as Medium Access Control (MAC).
3. **It wasn't always called Wi-Fi 6…** but that sure is an easier name than 802.11ax standard! The name, Wi-Fi 6, was chosen because this is the sixth generation of Wi-Fi networking technology, following on from Wi-Fi 5 (802.11ac) and Wi-Fi 4 (802.11n).
4. **Wi-Fi 6 is more than just an upgrade.** While it is an evolution, Wi-Fi 6 isn't just a performance upgrade for Wi-Fi 5 – it makes some fundamental changes to the standard that enables it to perform significantly better. Wi-Fi 6 is designed to deliver superior user experiences for application performance, support more number of users, particularly in bandwidth-intensive or latency-sensitive applications. That means fewer dropped video calls, amongst many other benefits.
5. **90% of enterprises will use Wi-Fi 6 by 2023.** According to a report released by Huawei during Mobile World Congress 2019, the uptake of Wi-Fi 6 will be almost complete in the corporate sector in the next four years. This will be mostly due to the increased use of technologies such as 4K/8K Ultra HD Video, virtual and augmented reality across education, enterprise, and industrial activities. Wi-Fi 6 will deliver the high-quality network, bandwidth, reliability, and low latency needed to provide an optimal experience in the IoT world.
6. **The first Wi-Fi 6 products are available now.** Huawei launched Wi-Fi 6 products earlier this year, under its new AirEngine Wi-Fi brand. The combination of AirEngine and Wi-Fi 6 capabilities delivers the connectivity needed to drive digital transformation for enterprise services and create an optimal user experience with ultra-high performance capacity. We already can see use cases emerging of Wi-Fi 6 deployment with customers in Middle East market.

Faisal Ameer Malik
Chief Technology Officer - Enterprise Business Group
Huawei Middle East

HUAWEI

REGIONAL NEWS

The UAE ICT Sector Achieves Significant Progress: According to the Global Competitiveness Index 2019

The Information and Communication Technology Sector in the UAE has achieved significant progress in global ranking from the 6th to the 2nd rank, according to the Global Competitiveness Index (GCI) 2019 issued by the World Economic Forum. This report is considered one of the most important global competitiveness reports that countries rely on to measure the performance of their sectors. The ICT Sector ranked first among other sectors in the country in the level of progress in the global ranking. The GCI also measures the efficiency and competitiveness of the ICT sectors in the world through the "ICT adoption" pillar, which includes a number of global competitiveness indicators that measure the sector's performance. The UAE remained the first globally in the mobile broadband subscriptions index, in addition to the second position in mobile-cellular telephone subscriptions. The UAE advanced to the fourth position in fiber Internet subscriptions, and fifth in the rate of Internet users. The UAE advanced 35 ranks in Fixed- broadband Internet subscription reaching the 27th position globally. Commenting on these achievements, H.E. Hamad Obaid Al Mansoori, TRA Director General, said: "The UAE's achievements in global indicators are cumulative milestones towards the goal we all seek to achieve the country's global leadership in all fields, especially the ICT sector due to its exceptional importance as key of progress in all sectors. In the United Arab Emirates, under the directives of the wise leadership, we are keen to create and provide advanced infrastructure capable of achieving the highest positions in the ICT indicators. We are working to create the suitable conditions to accommodate advanced technologies, including Artificial Intelligence technologies and Internet of Things, in order to reach the principle of sustainability and increase the happiness of society." H.E. Al Mansoori added: "Every achievement is a strong motivation for us to move forward and develop our policies and plans for further accomplishments. Today we are in the first position in many indicators, but we must not forget that we have to put more efforts in the rest of the indicators. In the UAE, our leaders have taught us to seek the first position. My team at TRA and myself, in cooperation with our partners in the government sector, are determined to contribute actively to the realization of our country's goals and future visions to be first in the world in all fields. " Moreover, Tariq Al Awadhi, Executive Director of Spectrum Affairs and the Leader of the National Agenda Team at TRA, said: "TRA continues to work with the operators to raise the country's ranking in global competitiveness indicators by developing the telecommunications infrastructure. This would raise the sector's readiness to meet the needs of the rapidly evolving telecommunications technology to ensure smooth and fast adoption of modern technology in the country, especially as we are on the threshold of the Fourth Industrial Revolution, which requires preparedness to keep up with future technology such as autonomous vehicles, robots, blockchain, 3D printing and more." Furthermore, the UAE also advanced from 25th to 2nd position globally in the Telecommunication Infrastructure Index (TII), a global competitive index issued by the United Nations in 2019, surpassing many developed countries in the sector, and reflecting the level of development of the ICT sector in the UAE. TRA is working to achieve the first position in this index in order to achieve the goals of the National Agenda to be the first in the world in TII by 2021. The Global Competitiveness Index, first published in 1979, provides a comprehensive overview of the economic expectations for 141 economies. Based on these results, the report stimulates economic growth across the world, leading to improved living standards. The report explores the relation between competitiveness, prosperity and environmental sustainability. It seeks fair societies that provide opportunities for a decent life for all to achieve sustainable development. The report also reviews the options of emerging and promising economies to achieve the three objectives of growth, inclusiveness and sustainability.

Digital Transformation to Increase Egypt's Competitiveness

Amr Talaat, Minister of Communications and Information Technology, stressed that Egypt stands side by side with Lebanon on the back of recent incidents in the country. He also appreciated Lebanon's steadfastness in transforming into a modern technological society. It came during his speech at a symposium held by the Egyptian Lebanese Businessmen Friendship Association (ELBA) on Tuesday evening, entitled "Digital transformation: the way to economic growth". The Minister explained how the ministry is putting in great effort in order to keep Egypt at pace with the rest of the world. The government hopes to achieve digital transformation of Egypt and plans to do so through two axes; automation of the government, and training Egyptian youth on technological developments. This will also allow for the Egyptian economy to increase its competitiveness in domestic and international markets. He explained that the first step to build a digital society will be moving the government to the New Administrative Capital and get rid of the paper-based bureaucracy. He explained that a digital government requires a digital transformation of services through the development and modernization of information infrastructure and improvement in addition to a strong legislative framework that provides e-commerce governance, data security, and the preservation of seller and buyer rights. Talaat also noted that legislation have been promulgated and are intended to be completed in order to combat internet and digital offenses. The Minister revealed that the government aims to automate three services nationwide by the end of January 2020, which includes providing all traffic services excluding technical inspection of cars, launching documentation and agency services, as well as supply services. The minister said that the three services will be available to citizens through a digital platform or government portal, telecommunications centers, and mobile applications besides the Egypt Post branches. He also confirmed that the post offices will carry out financial services provided by the Micro, Small and Medium Enterprises Development Authority in order to better facilitate funding for young people looking to start their businesses. Talaat added that the second phase of the project aims to provide services more proactively and will include alerting the citizen in case of residency change in order to transfer some services such as electricity meters or supply services. Consumers will also have these services provided through kiosks in modern gas stations. "The driver will be allowed to renew the license at the services kiosks while refueling," Talaat said. He noted that the services will also be provided via call centers and delivery services if a person does not need to visit government facilities. The minister pointed out that the three automated services are part of Egypt's project to digitize government services, which has already begun in a pilot application in Port Said governorate and includes the provision of 170 government services at a cost of EGP 8bn and a period of 36 months. The circulation of the automation project to the rest of the country would require linking 33,000 government facilities in 27 governorates with fiber-optic networks to prevent any interruptions or disruption to service. He revealed that 170 mechanized services will be provided in Port Said governorate by the end of this year, where the first launch of the project started in the governorate by providing 18 services last July, 25 services in September, and then 34 digital services in October, He noted that 800 service sites and a government building in Port Said have been connected to fiber-optic networks. The minister said that with the completion of three fully automated projects in addition to the automation of 170 services will be followed by larger projects, such as the new comprehensive health insurance system, farmer card, and a restructuring of the national tax system. He explained that the comprehensive health insurance project, which began in Port Said, will be fully automated, starting from verifying the eligibility of the citizen and then automating all healthcare services such as disbursing medicines and financial settlements, noting that the second phase of the project will be in four governorates: Ismailia, Suez, Luxor, and Aswan. Talaat explained that the farmer card project aims to automate the fertilizer and chemicals system, rationalize water usage, and preserve the state's financial resources by ensuring the delivery of subsidies to its rightful beneficiaries. The farmer card will also verify land acquisitions and cultivated areas in order to develop an integrated agricultural map that will help measure the amount of water needed for agriculture and the season's crops, and to clarify agricultural gaps between production and consumption to achieve stability in goods

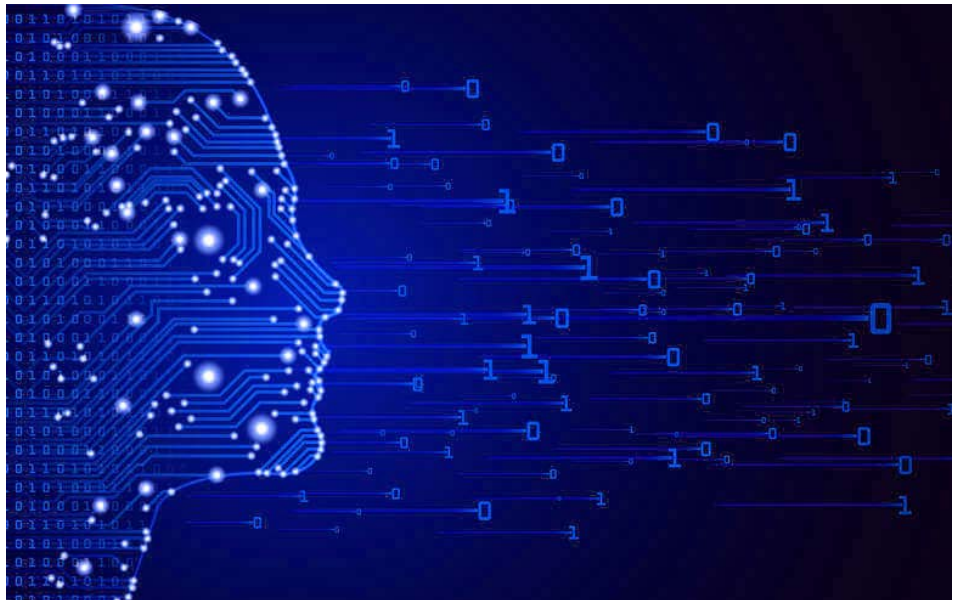
and markets He pointed out that the implementation of the project in Port Said and Gharbia governorates are just the first stage, with plans to expand to all governorates within 24 months. Talaat pointed out that the application of the project and its circulation will provide an information map on agriculture in Egypt and will better handle the encroachment of agricultural land and reduce wrong practices in obtaining government support unlawfully. He added that the project of restructuring the tax system is being implemented in cooperation with the Ministry of Communications and the Ministry of Finance and aim to achieve tax justice and discipline for the tax community. This newfound tax structure will expand the tax payer base without burdening the taxpayers, thus increasing tax revenues. In regard with increasing the internet speed in Egypt, Talaat said that the volume of investments allocated to improve speeds have reached $1.6bn, adding that the average internet speed in Egypt will reach 20Mbps by the end of this year, compared to 17.75Mbps currently, and will increase to 40Mbps by the end of 2020. He stressed that his ministry is working in cooperation with the Ministry of Youth and Sports to develop youth centers scattered around the country, which is estimated to be about 4,000 youth centers. This will better help the country train and create the next generation to keep pace with technological advancements and deal with various applications. Talaat explained that the ministry is looking to connect fiber optic cables to 100 centers by the end of the year. He added that the ministry has trained 4,000 young people in fiscal year 2017/16 and 13,000 last year, and plans to train 25,000 youth this fiscal year, noting that six new training centers will be established, bringing the total to 12 centers. Regarding innovation and technology projects, the minister said that the telecommunications sector produced 1,500 new companies last year, and that major foreign companies have taken over nine of them, noting that Egypt became the second fastest growing economy in the Middle East last year, of which 4% comes from the communication sector, up from 3.2% contribution to GDP last year, with plans to reach 8% in three years. The minister reviewed the second axis of Egypt's digital strategy, which aims to develop the health and education sectors along with youth training on digital transformation. He explained that the use of contemporary smart technology and applications have become a key element in increasing an individual's competitiveness for a job. He revealed the most important feature in the grand scheme of the project is the construction of the city of knowledge that will be built on an area of more than 200 feddan in the new administrative capital. The first phase includes the establishment of four technology buildings. Fathallah Fawzy, President of the ELBA, affirmed the Egyptian people's solidarity with Lebanon in their march to reform, stability, and prosperity. Fawzy said that the technological revolution and digital transformation in Egypt is the largest step in its overall and comprehensive reform process, which started after President Abdel Fattah Al-Sisi assuming the presidency years ago “We see the results ourselves in the digital transformation and the great leap in digitization and the use of technological applications in advanced technological programs, whether on the economic or social level," he added. Ahmed Sarhan, Chairperson of the Committee on Communications and Information Technology said that digital transformation is an important tool for economic growth and is no longer a luxury or choice. Digital transformation has positive economic and social effects and is a locomotive for economic growth and can achieve state plans and objectives, he added. Sarhan noted that the automation of government procedures has a positive effect in facilitating access to services for citizens, improving the efficiency of services, reducing bureaucracy, assisting the government in combating corruption, and can create a real database that contributes to drawing development and investment plans on real and realistic bases. He stressed the importance of national companies and the Egyptian youth entering digital transformation projects and automating state procedures. Egyptian companies have the opportunity to be influential, industrial, and participate in all components and stages of the digital transformation projects. Khaled Hegazy, CEO of Etisalat Misr Corporate Sector, said that digital transformation has gained great importance for Egypt with the launch of the economic reform program and other giant national projects. He stressed that the private sector is looking forward to achieving real integration with the government and is encouraging partnership with various government entities to enable itself and the Egyptian youth to play their role in digital transformation projects and provide new ideas to provide digital services to citizens in various fields.

Al Madar Switches on 5G Services

Libyan cellular operator Almadar Aljaded (Al Madar), the country's second largest mobile network operator (MNO) by subscribers, has announced the launch of 5G services following successful testing of a trial network capable of speeds up to 1.5Gbps. The company has said the service will initially be available in the country's main cities by 2020, before eventually being rolled out nationwide. Al Madar has also extended its LTE-A ‘4G+’ service, first launched in January 2018, to the cities of Qaminis, Kufra and Marj in recent weeks.

Artificial Intelligence Driving IT Spending in UAE

Spending on IT across the UAE has been witnessing a steady increase, driven by businesses looking to increase efficiency, improve performance, and reduce costs, by investing in artificial intelligence systems, experts said. "We are definitely seeing a significant increase in AI adoption in the UAE," Ali Hyder, group chief executive officer of Focus Softnet, told Khaleej Times. "AI is changing the way we use technology and conduct business, communicate with our customers/vendors and analyze our data. It has the potential to bring change on a wide scale to organizations, where customer and operational data is primary to the business. AI presents organizations with tremendous opportunities to augment human capabilities across industries and this technology is transforming systems through creativity and agility." Experts noted that the UAE is expected to scale up investments in AI and blockchain solutions - a trend that should lead to more growth opportunities for businesses. "On the industries front, AI brings in so much quality and accuracy into processes," said Hyder. "With its inherent capability of automation and machine learning capabilities, AI helps in multi-tasking, helps people with different abilities perform like others, and increases workload many times over as compared to the normal way of doing the same task. Image recognition, speech recognition, natural language processing and machine learning are a few of the commonly-applied AI technologies." Ramprakash Ramamoorthy, product manager at Zoho Labs, noted that while AI will make an impact across all sectors, the technology sector has, unsurprisingly, been one of the early adopters of AI. "A substantial amount of AI technology has been applied in the IT management space and is effectively improving productivity," he said. "AI can predict outages, forecast demand, present actionable insights from service desk tickets, enable better customer satisfaction via chatbots, and much more. AIOps, which essentially means leveraging AI for your IT operations, is catching up fast. "The Internet of Things and AI continue to play a pivotal role in shaping our strategy towards an ecosystem that enables productivity and drives digital transformation - whether it be for an office building, a hospital, or a university," added Ahmed Khashan, president of Gulf countries at Schneider Electric. "Collaborative efforts between government and private bodies have been vital in fast-tracking digital transformation initiatives and building sustainable, secure and reliable urban communities especially in the UAE." Gartner predicts the use of AIOps in business will rise from 5 per cent in 2018 to 30 per cent in 2023. It's only a matter of time before AI is adopted across critical business functions like credit approval, money laundering detection, and much more. AI is here to stay and will help us achieve better employee productivity and customer satisfaction.



SBP Grants Permission to 'Foree' to Provide Payment Services in Pakistan

The State Bank of Pakistan (SBP) has allowed Foree to provide payment services in Pakistan, as per a statement. Foree is basically a mobile payment platform that allows users to pay anyone using the QR code or mobile number, CNIC number, email address, twitter handle, Facebook or Foree address. Foree is a low-cost digital platform for businesses used globally. It allows even the smallest merchant to begin accepting digital payments in an affordable manner. You don't need any expensive POS machines for it. Foree Founder and CEO Saleem Ropani said, "Foree is on a mission to make payments easy, interoperable and trusted to power economies by delivering financial inclusion and social-economic justice." Adding, "Along with creating new avenues for jobs and formalization of the economy, through our technology, we are enabling access to financial services with ease and trust. Foree aims at becoming the backbone of Pakistan's digital society." Foree has almost 150 million cellular users, 70 million 3G/4G/broadband subscribers, and 60 million bank accounts. Co-founder and Chief Technology Officer of Foree Mehdi Hussain said, "Keeping our customers and users safe and delighted is our number one priority at Foree. We dedicate extensive resources to ensure all the user data and information is secure. We've built a company culture that reinforces trust at every opportunity."

Bahrain's iGA Rolls out NotifyMe System for Government Services

Bahrain's Information & eGovernment Authority (iGA) highlighted the NotifyMe integrated government notification system, which sends updates about all government services, including license expiration dates and maintenance works in residential areas, to citizens through text and email, at the Consumer Protection Forum and Expo 2019, held under the patronage of the country's Minister of Industry, Commerce, and Tourism, Zayed R. AlZayani. Commenting on the NotifyMe system, deputy chief executive of electronic transformation at iGA, Zakareya Ahmed Al Khaja said that the government-to-citizen communication system aimed to enhance consumer protection, promote transparency in government services, and improve digital automation processes. According to Bahrain News Agency, Al Khaja added that the notification system is

in line with the directives of the Government Executive Committee, chaired by HRH Prince Salman bin Hamad Al Khalifa, Crown Prince, Deputy Supreme Commander, and First Deputy Prime Minister.

Infor Drives Digital Transformation in Saudi Arabia

Infor, a global leader in business cloud software specialized by industry, has reaffirmed its commitment to supporting Saudi Arabia's digital transformation efforts across a broad range of sectors. Following a string of project successes and recent signings, the enterprise software vendor reports its license revenues in the kingdom have increased by 78% between FY18 and FY19, a testament to the escalating interest in digital transformation technologies across Saudi Arabia. Digital transformation has been a key focus area of Saudi Arabia's Vision 2030, which aims to enrich the lives of its citizens and develop a prosperous and future-ready society. At the recent Smart Nation Innovations Week event in Singapore in June, H.E. Eng. Haitham Al-Ohali, Saudi Arabia's deputy minister of communications and information technology, stated that collaboration with the private sector has enabled the country to become a rapidly expanding technology market, whose volume is forecasted to surpass $35 billion by 2030. Further expanding its presence in this fast-growing segment in the kingdom, Infor recently signed two agreements with Saudi Bugshan, one of the largest groups active in the Middle East and North Africa with interests spanning automotive, beauty & fragrance, education, food & beverage, healthcare, and real estate. Firstly, Infor will assist the conglomerate with its ambitious digital transformation efforts across multiple countries with the implementation of a suite of applications based around Infor LN enterprise resource planning. The second agreement revolves around Saudi Bugshan Barmaja becoming an alliance partner assisting in the deployment of a range of Infor solutions across the region. Another recent addition to Infor's portfolio lies with Almajdouie Logistics Company's adoption of Infor's warehouse management system (WMS). Almajdouie, one of the largest logistics service providers in Saudi Arabia, desired a robust and scalable integrated WMS that would meet immediate needs and cater to future demands. These projects join Infor's already impressive customer portfolio for Saudi Arabia, which includes MEDISERV, Zahid Tractor & Heavy Machinery Co. Ltd, Saudi Diesel Equipment Co. Ltd., and Saline Water Conversion Corporation. "With digital transformation being a key focus of Saudi Arabia's Vision 2030, it is no surprise that we continue to find success in the kingdom, with increasing demand for our enterprise solutions," said Jonathan Wood, Infor general manager of Middle East and Africa. "It is our privilege to support organizations across a range of industries in Saudi Arabia as they undertake their first digital steps to a brighter future, and we hope to continue being the first choice in industrial enterprise solutions in the future."

Lebanon's OGERO Signs MoU with Dell Technologies to Advance Its Digital Infrastructure

By signing the Memorandum of Understanding (MoU), both OGERO, the leading telecommunications provider in Lebanon and Dell Technologies will further enhance their technological capabilities with the aim of enhancing customer experience and driving down costs. The partnership will also help OGERO implement state-of-the-art, reliable, secure and adaptable solutions that will fuel Lebanon's digital connectivity and infrastructure. Since being founded in 1972, OGERO has constantly been innovating to meet the evolving needs of customers. In fact, it has become one of the most trusted and go-to option for all telecom networks. Furthermore, it is also constantly innovating to improve and expand its portfolio to include voice and data services primarily based on Fiber (FTTx). Today however, success for an organization is based on whether it is able to deliver a differentiated product or service to the market. The MoU signed between both organizations will now have them work to implement a significant cloud project that will host their workload as well as those from their affiliates. The solutions offered by Dell Technologies will enable OGERO to become more agile to operate and capitalize on the opportunities that will present themselves in any market condition. Furthermore, both the companies will collaborate to understand the unique requirements and objectives of each other, its customers and the Lebanese government in order to lay the foundation on which a thriving and sustainable economy can be built.

Oman Boosts MENA's Digital Customer Experience Market to US$800 Million

Bolstered by Oman Vision 2040, the Sultanate's transport and logistics and retail sectors are supporting the Middle East and Africa's customer experience solutions market to reach a record high of $800 million, industry experts announced ahead of Gitex Technology Week. Across Oman and the region, organizations of all sizes and industry verticals are ramping up digital transformation, and leveraging technology to enhance employee, citizen, and customer experiences. As a result, the Middle East and North Africa's digital customer experience market is set to reach a record-high of $800 million, according to a report by Micro Market Monitor. As Oman embraces the Experience Economy, organizations can no longer deliver only products and solutions – they need to deliver enhanced experiences. By combining customer "x-data" with operational "o-data," organizations can better understand customer beliefs, emotions, and intentions. Organizations can become intelligent enterprises with greater business visibility, focus, and agility. Customer experience will be a major theme at Gitex, the largest technology event in the Middle East, Africa, and South Asia, Omani firms are lining up to attend Gitex, with the theme 'Synergising the Mind and Technology Economy'. Global technology company SAP will exhibit the future of digital employee and customer experiences, "The Future of Business Has Feelings – Change a Feeling, Change a Business." "With Oman Vision 2040 supporting expanded airports, ports, and malls, the Sultanate's transport and logistics and retail sectors are investing in digital transformation to enhance customer experiences," said Waheed Al Hamaid, managing director, SAP Oman. "As the Middle East's customer experience spend reaches a record-high, Gitex presents a key platform for Oman's organizations to experience customer experience innovations to optimize costs, productivity, scalability, and business competitiveness." Visitors to SAP can experience "The City of Possibilities" -- how digital transformation is impacting businesses, societies, and our environment. Real life showcases led by the Mercedes Benz EQ's innovative Formula E race car, the early prototype of SAP's platform for people of determination to be brought to life during Expo 2020 Dubai, a Smart Haj concept digitizing the experience, and a sustainable logistics approach with UPS and Fernhay. Industry vertical demos include robotics, re-imagined café experience, and intelligent healthcare; blockchain applications in universities and ports; employee experience management; and e-sports. With the SAP C/4HANA customer experience suite, boosted by Qualtrics CustomerXM, organizations can listen, gain actionable insights, and evaluate corporate impact to deliver unparalleled experiences. The Middle East and North Africa organizations can also leverage the SAP solutions running on its local data centers in the region to run in real-time and ultimately optimize customer experiences.

TRA Launches its Digital Radio

The Telecommunications Regulatory Authority (TRA) has announced the launch of its digital radio on the Internet. TRA Digital Radio is an effective means by which the public can learn about the most important news, reports and services of TRA, as well as latest developments of the ICT sector. Those who wish to listen to TRA radio can check the radio page on TRA website. TRA digital radio is a new window through which TRA reaches its customers to introduce its achievements and services, as well as the latest developments in the ICT sector. The radio aims to reach a wider audience, including people of determination with visual impairments. The radio can be heard worldwide around the clock. On this subject, H.E. Hamad Obaid Al Mansoori, TRA Director General, said: "In line with our wise leadership directives,

TRA ensures to be closer to customers, and to stay in touch with them around the clock by activating more channels of communication. We have made great efforts in the development of TRA website. We also ensure to provide distinctive and creative content on our social media channels. Today, we launch the online radio to complement the image with the voice in order to give our customers a comprehensive idea of TRA and its key role in regulating one of the most vital sectors of our time. " H.E. Al Mansoori emphasized that the launch of TRA radio comes in response to the needs and wishes of an important group of customers, the people of determination with visual disabilities, whether they are blind or visually impaired. He added: "Our children, brothers and sisters from people of determination may not be able to follow TRA news published in newspapers, website or social media, and hence the importance of radio, which is an ideal solution for our visually impaired children to follow TRA news and services, especially smart services that they can use anywhere and anytime." Through the radio, TRA customers can learn about TRA news, the latest monthly reports and the latest statistics in the ICT sector. They will also learn about the most important updates to our policies, regulations, and terms & conditions. In the second phase of the radio, specifically after the fourth quarter of 2019, the radio will have live interactive broadcast aimed at identifying the customers' views about TRA services and taking their inquiries and suggestions, through the allocation of live broadcast hours. The radio will broadcast TRA's responses to the inquiries it receives through the call center, in addition to presenting the most important smart services, tips and guidance on dealing with the digital space provided by specialized engineers from the Computer Emergency Response Team (aeCERT) of TRA. TRA ensures to diversify and activate its channels of communication with the public. The launch of TRA digital radio coincides with the launch of the TV program of the digital government, which will introduce the audience to the UAE mGovernment and the services provided by the government through all available channels. The program will promote TRA brand as the enabling entity of digital transformation in the country, in addition to spreading awareness of TRA services and mission, enhancing a culture of innovation and future shaping through interactive channels and programs.

UAE TRA Signs MoU with EBTIC

The Telecommunications Regulatory Authority (TRA) has signed a Memorandum of Understanding (MoU) with the Emirates ICT Innovation Center (EBTIC), on the sidelines of GITEX Technology Week 2019. The MoU aims to enhance cooperation between the two parties in the fields of research, development, innovation and future foresight in the UAE ICT sector, in line with the mutual interests of both parties to work towards the adoption of various technologies in ICT to drive innovation in the UAE. On this MoU, H.E. Hamad Obaid Al Mansoori, TRA Director General said: "The UAE's goals, aspirations and future visions can only be achieved through the cooperation of all local, government and private entities. TRA, in line with the directives of the wise leadership, is keen to create partnerships and open channels of communication, cooperation and coordination with all its strategic partners in the country, which would accelerate the pace of work towards achieving goals in all areas related to the Fourth Industrial Revolution, artificial intelligence, the Internet of Things and big data." H.E. Al Mansoori assured that TRA will continue its efforts as one team with the federal, local and private entities, in line with the wise leadership directives. He added: "It is evident that teamwork and coordination can deliver results that exceed expectations. We are collaborating with EBTIC to work within an important sector, namely the ICT sector, which is the basis of development in various fields. We have recently witnessed one of Zayed's sons reaching the space, as The UAE Space Program has been the result of cooperation between various entities, as well as the development of the UAE's telecommunications infrastructure. Such achievements make us determined for more accomplishments, which will enhance the country's position and global competitiveness." The MoU aims to activate the process of smart digital transformation of government entities in the UAE, through the application of modern ICT technologies in their fields. The two parties will cooperate to encourage and conduct scientific research and development on the challenges facing the

UAE in general, and TRA strategic sectors in particular. The parties will understand and apply the process of digital transformation of TRA strategic sectors, and stimulate innovation in UAE government entities through mutual participation and suitable technical proposals. Moreover, the agreement provides for the nomination of a joint team to perform the tasks of strategic supervision and management of agreed projects, enable research and innovative projects by providing relevant data and prototypes to meet agreed challenges, build capacity and develop the skills of UAE nationals in the areas of research and innovation in the UAE, and the adoption of ethical standards for scientific research, including experimental and data analysis and adherence to those standards. As per the MoU, TRA will provide EBTIC with the necessary data for the implementation of projects of mutual interest. TRA is participating in the 39th edition of GITEX Technology Week, held at Dubai World Trade Center (DWTC) under the umbrella of the UAE mGovernment, which includes 18 federal government entities that showcase their achievements in employing technology to provide smart government services in an integrated manner, promoting the principle of single government and distinctive services. In GITEX, TRA highlights its future projects and role in providing technological solutions for government services to achieve the highest levels of service and customer satisfaction.

Digital Economy to Boost Pakistan's GDP up to US$40 Billion Annually

'Digital economy in Pakistan' has huge potential for boosting the country's Gross Domestic Product (GDP) up to the level of $ 40 billion, besides consolidating the local economy. Through the evolution of 'Digital Economy', Pakistan can rapidly achieve its economic agenda in all major sectors including trade and E-commerce, education and health for economic growth in the country, a senior official of Ministry of Commerce informed APP. Pakistan needed to do extensively in digital economy as country has huge participation of global mobile market, with over 160 million mobile phone subscribers and around 150 million Internet users, he said. He said, "We can improve public services in different sectors through the modern digital tools for providing rapid services to the people". He said that Pakistan was an agriculture country and through the modern digital mechanism, the farmers and agriculture workers can improve their financial mechanism to connect with global value chain. Replying to a question, he said that digital data integration system would play an important role in improving the economic mechanism in all major sectors of the country's economy. He said it is also important for bridging the gap in economic and trade data process through integration of various data mechanism to reflect the true picture of the economy including trade, industries, services and agriculture sector. "To evolve the proper trade data mechanism to resolve the issues in trade data, the government intended to include Export Processing Zones (EPZs) in its trade data collection system, which was not currently taken into account by the Pakistan Bureau of Statistics (PBS) and the State Bank of Pakistan (SBP), he told. He pointed out that exclusion of exports, routed through the EPZs by the two organizations resulted in a difference of $1.2 billion between the actual exports and those reported by them. The official said the federal cabinet had already approved the E-commerce policy for promoting the digital culture and paperless trade to help enhance the trade volume. He said it was the government's priority to evolve the integrated trade data system and streamline the affairs by the end of October. All the system would be linked to the Ministry of Commerce under the control of SBP to promote the culture of freelancing to capture opportunities in the global market through websites and other digital tools, he added. He said the software export potential was not being exploited properly as three different pieces of software were being used by freelancers to acquire the work deals from abroad. He said mainly the youth were providing their services (to individuals/firms abroad) through the freelancing system, but they were facing problems because of different software. The government would facilitate them so that they could work with ease, he added.

Jazz, Afiniti to Enhance Customer Experience Using AI

Jazz, Pakistan's leading digital communications company, and Afiniti, a multinational advanced analytics company, have partnered to implement Artificial Intelligence (AI) solutions in customer service contact centers across Pakistan, fostering significant gains in customer satisfaction and revenues, according to a press release issued by the company. As part of its long-term commitment to meet and exceed customer satisfaction, Jazz engaged Afiniti to use their AI powered contact center technology to optimize call outcomes at Jazz's customer service contact centers. By analyzing call histories and other CRM data, Afiniti's algorithm predicts patterns of interpersonal behavior and matches callers with Jazz's contact center agents best equipped to serve them. "Industries globally are advancing rapidly thanks to AI and we wanted to use this technology for the benefit of our customers," said Aamir Ibrahim, CEO Jazz. "Afiniti is the world's premier provider of applied artificial intelligence solutions, having delivered billions of dollars in measurable economic value to its clients around the world" said Zia Chishti, CEO Afiniti.

PTCL Posts Double Digit Growth in Net Profit

Pakistan Telecommunication Company Limited (PTCL), the country's leading telecom and ICT services provider, has announced its financial results for the nine months' period ended September 30, 2019 at its Board of Directors' meeting held in Islamabad on October 16, 2019. PTCL Group's revenue for the nine months has grown year-on-year (YoY) by 4.5% to Rs. 98 billion. Ufone revenue has increased 6% YoY, UBank, a microfinance banking subsidiary of PTCL, has shown significant growth of 50% in its revenue over last year. PTCL Group's operating profit and net profit for the nine months have decreased by 15% and 32% respectively as a result of high inflation, significant devaluation of PKR against USD and higher power tariffs. PTCL revenue of Rs. 53.8 billion for the nine months is slightly higher than last year by 0.4%. PTCL's flagship Fixed Broadband services posted revenue growth of 5%. PTCL continues its journey to upgrade its top revenue generating exchanges under Network Transformation Project (NTP) in different parts of Pakistan. For the 95 exchanges fully transformed to date in 12 cities, YoY revenue growth is even higher at 12% and there is a 35% reduction in customer complaints. Fiber-To-The-Home (FTTH), deployed in major cities with more than 100,000 lines, has received a positive response from the customers. Corporate, Wholesale and International businesses continued their growth momentum from 2018 and has achieved 7% overall revenue growth. PTCL has entered into strategic partnership with a local telecom operator for its network expansion, with edotco to enhance Pakistan's connectivity capabilities and Irdeto for Wi-Fi management and parental control functionalities. Wireless revenue for the period has declined on YoY basis due to strong competition by the cellular companies providing wireless

data services. There is continued decline in voice revenues due to continued conversion of subscribers to OTT, cellular services and illegal/grey traffic termination resulting in declining voice traffic volumes. PTCL has posted a Net Profit after Tax of Rs. 5.5 billion for the nine months which is 14% higher than same period of last year. Operating profit for the period remained under pressure compared to last year mainly due to increase in operating cost on account of significant hike in power tariffs and currency devaluation. However, non-operating income has increased due to higher income on investments as a result of increase in interest rates and translation gain on forex based assets. VIS Credit Rating Company Limited (VIS) has reaffirmed entity rating of PTCL of "AAA" (Triple A) and short term rating of "A-1+" (A-One Plus). The medium to long-term rating of 'AAA' denotes highest credit quality, with negligible risk factors, being only slightly more than for risk-free debt of Government of Pakistan. The assigned

ratings reflect PTCL's leading market position, extensive network infrastructure, strong financial risk profile and adequate business risk profile. Ratings also incorporate strong sponsor profile with majority shareholding of 62% vested with the Government of Pakistan and 26% stake along with management control being held by Etisalat International Pakistan, a 90% owned subsidiary of Etisalat Group. This year, PTCL portrayed its connection with the people of Pakistan through our Independence Day campaign TVC that was viewed more than 7 million times on social media platforms. The main theme of the TVC was along the lines that PTCL is the backbone of connectivity in Pakistan and a company trusted by customers for their daily connectivity needs in turn trusts PTCL to enable provision of these services. As part of 'Clean & Green Pakistan Movement', PTCL undertook beautification, renovation and re-landscaping of 3 main places in the capital city. PTCL participated to support the startups incubated at National Incubation Center (NIC) Karachi at a special graduation ceremony, at NED University Karachi, for the first cohort of startups. PTCL held a special ceremony to commemorate Defense Day, observe solidarity with the people of Kashmir and pay tribute to the families of martyrs who lost their lives protecting the motherland.

Bahrain's National Broadband Network Officially Launched

The Kingdom's National Broadband Network (BNET) was officially launched at a high level press conference held at the Capital Club. The launch was announced by Batelco Chairman, Shaikh Abdulla bin Khalifa Al Khalifa, in the presence of the Minister of Transportation and Telecommunications, Kamal Ahmed, BNET CEO Mohamed Bubashait, CEO's of OLO's (Other Licensed Operators) and members of Bahrain's media. During the event, the BNET logo, which will soon be rolled out to all customer touch points, was revealed. The launch event follows on from the announcement of Batelco's legal separation into two independent entities, which was announced at an earlier press conference held in May. As part of the legal separation, a new executive structure was implemented and new CEOs were appointed for both Batelco and BNET. Independent buildings and departments were also allocated for each entity, in line with the nature of the companies' work. In line with the requirements of the 4th National Telecommunications Plan approved by the Council of Ministers in May 2016, BNET will provide broadband network services to all licensed operators including Batelco, whereas, Batelco will focus solely on retail and corporate operations. Mr. Ahmed expressed his pleasure at the launch event by saying, "I would like to thank the team involved in the implementation of this successful project, which contributed towards turning the vision of the National Telecommunications plan into a reality, and is being witnessed today during this event. This project is a major leap for the services provided by telecommunications companies, where all customers will be able to benefit from high-speed Internet services from all telecom providers." During the event, Mr. Mohamed Bubashait, CEO of BNET gave a detailed presentation about the company's vision and functions as well as its strategy for managing the national network's infrastructure. The presentation also included a detailed explanation of the operational model and work mechanism that the company will follow to achieve its objectives. Also revealed was BNET's new logo, designed to symbolize both the national network and the Kingdom while being distinguishable from Batelco. Shaikh Abdulla stated that he was very pleased to announce the launch of BNET which is a key part of the Fourth National Telecommunication Plan (NTP4) to develop the growth and economic diversification of the telecommunication sector, including rolling out a fiber optic network to 100 per cent of all businesses and 95pc of all households across the Kingdom. "The restructure of Batelco is now complete with independent management teams and human resources in place. BNET's teams are now working on the implementation of its strategic plans which focus on the development of the fiber optic network across Bahrain and the provision of high-speed Internet services for OLO's on a fair and competitive basis. "The company will continue to complete the separation process as required in line with the Government's strategy and future vision for the telecommunications sector." "This step is part of a series of initiatives aimed to enhance Bahrain's position as a strategic investment destination, a regional ICT hub and a major contributor to upgrading the Kingdom's telecommunications services," he concluded.

Bangladesh Launches Digital One-Stop Services

Prime Minister's ICT Affairs Adviser Sajeeb Wazed Joy has inaugurated here three digital one-stop services - "Eksheba", "Ekpay" and "Ekshop" - to enable the people to get different government services, utility bills and fees payment facilities and e-commerce. According to a report of the nation news agency -- BSS, citizens will be able to pay water bills and holding taxes, get municipality or city corporation certificates, automated property management and e-trade license facilities under the pilot program. The newly launched "Eksheba" is a single platform where the citizens will get 162 government services. All government services (3,000) will be connected to the digital platform in phases. The "Ekpay" is a one-stop payment platform where the people will get facilities to pay utility bills, education related fees and other payments. The "Ekshop" is the country's first "rural assisted" e-commerce platform which will enable people to get necessary products in an easier and faster way. Through this platform, people will be able to buy rural products. Speaking on the occasion, Sajeeb Wazed Joy said: "Our goal is that, by the year 2021, majority of citizen services will be provided either on their fingertips of mobile phones or through our union digital centers at the doorsteps of people." He termed the launching of the digital services as "buildings blocks" to implement the Digital Bangladesh. With the launching of digital municipality services system in nine municipalities and one city corporation as a pilot project, the government has a target to reach the services to 300 municipalities by 2021, he added.

Pakistan's Mobile Ecosystem Contributes US$16.7 Billion to GDP

The mobile ecosystem in Pakistan is playing an increasingly important role, which is evident from its contribution to economic growth. The telecom system contributes around $16.7 billion, 5.4% of gross domestic product (GDP), to the economy, according to a research report. The report, titled "The power of mobile to accelerate digital transformation in Pakistan", stated that the country was deriving socioeconomic benefits from digital transformation, however, its rapid population growth could increase pressure on the existing infrastructure. This may, in turn, hinder efforts to increase social development. GSMA suggested the use of mobile platforms for national development plans to incorporate devices for improving gender equality, health, education and reducing poverty. The report, which examined the transformative opportunities presented by the mobile-enabled digital services in Pakistan, was launched at a roundtable meeting between the government of Pakistan and mobile industry leaders. GSMA recognized Pakistan's efforts to incorporate mobile technology in driving social development and economic growth. It stated that the mobile broadband network now covered 80% of the population and 97% of internet connections were mobile. "Pakistan has nearly 700,000 cellular Internet of Things (IoT) connections across areas including agriculture, clean energy, and safe water solutions." Mobile operators and the ecosystem also provided direct employment to around 320,000 people in Pakistan in 2018, said the report. Despite this, Pakistan still has much to do to realize its development aspirations as outlined in the country's digital transformation initiative, the report added. The youth bulge in the country is the catalyzing factor in the early realization of the digital ecosystem, which is helping Pakistan in swiftly catching up with its neighbors in South Asia and countries in the Asia-Pacific on several key human development indicators including education, health, and gender equality. GSMA suggested enhancing digital and financial inclusion and stated that Pakistan's population was still in transition and timely actions were needed for harnessing the benefits of digitalization. "Mobile offers the most extensive and inclusive platform to access the internet and digital technologies, which are vital for the Pakistani economy and its growth in an increasingly connected world," said GSMA Head of Asia-Pacific Julian Gorman. Also present on the occasion, Minister of Information Technology and Telecommunication Khalid Maqbool Siddiqui said the government, private sector, and the wider ecosystem must work together to deliver the promise of digital Pakistan. "The mobile industry is an important partner to deliver transformational change in the digital era and ensure that we bridge the digital divide," he said.

UAE, Bahrain Telcos Launch JV to Simplify Intra-Regional Connectivity

GCC-based telecoms operators Du and Batelco have launched a joint venture, Arc, with a mission to simplify intra-regional connectivity in the Middle East. Arc aims to offer interconnected data center solutions for carrier, cloud and content providers and major enterprise companies, a statement from the UAE and Bahrain telcos said. They added that in its initial phase, Arc will offer connectivity solutions to over 30 points of presence across the Middle East, Asia and Europe, integrated with data centers in the UAE and Bahrain, in addition to bridging cross connectivity with major regional cable hubs. "The challenge for network-centric businesses in the Middle East is to rapidly connect, optimize and control their services while having presence as close as possible to users," said Mahesh Jaishankar, CEO designate at Arc. "So far, it has been costly, complex and time-consuming to roll out applications and services across markets in the Middle East. Arc directly addresses these challenges and provides a seamless platform for cross border connectivity, similar to what we have seen in other regions around the globe." Arc aims to create a single platform for developing agile network ecosystems, offering prompt access to data networks and data center infrastructures across the region. "Today's ICT market is all about agility and experience. It's about seamlessly connecting hubs and growing your ecosystem across the region," said Ananda Bose, board member of Arc and chief wholesale and corporate officer at EITC, Du's parent company. "We're proud to be investing in Arc and supporting an innovative business that will ultimately benefit the region and the entire value chain, from carriers through to end users." Adel AlDaylami, board member of Arc and chief global officer Batelco Global, added: "For digital transformation and cloud adoption to grow in the Middle East, it needs to be simpler to connect and host solutions at the edge of the network."Arc is a powerful yet a simple solution that has been long overdue in the Middle East."

Up to 60 Million 5G Subscriptions in MEA by 2024: Ericsson

Initial 5G technology subscription in the Middle East and Africa (MEA) during the next five years – or by 2024 – would be almost double compared with the LTE/4G technology take-up for a similar period, Ahmed Ijaz, Ericsson's principal consultant in Middle East and Africa, told Arab News. The 5G subscription in MEA will reach 60 million users from 2019 to 2024, while 4G subscriptions topped 35 million users from 2011 to 2015 when the region saw initial LTE/4G deployments. The 60 million number would be primarily dominated by countries in the Gulf, particularly Saudi Arabia and the UAE, Ijaz added. 5G, or fifth generation technology, is a beefed-up version of the LTE/4G in terms of speed, capacity and responsiveness of wireless networks. Saudi Arabia was the earliest to deploy 5G infrastructure across the Middle East. With 5G technology eventually going mainstream, industries such as oil and gas – such as the use of drones with high-resolution 5G cameras connected to them – could harmonize their operations towards efficiency, Wojciech Bajda, the head of Ericsson GCC, told Arab News. "In Saudi Arabia, we find that the value of 5G will come from a select set of industries and these include the oil and gas sector," Ijaz said. The network will help the industry in terms of controlling the pipelines and making sure there is monitoring of remote areas, Bajda meanwhile said. Smart transportation, Ijaz added, is another sector in Saudi Arabia that will implement the 5G network to help make road infrastructure safer in the Kingdom. Smart traffic systems, for example – operating over a 5G network – could help ease the flow of traffic through monitored cameras and sensors. On the consumer side, Bajda said that 5G technology for individuals is about experiencing better network speed. "Today, especially in the GCC, video consumption is huge; people have better phones and higher resolution screens that will help provide better quality of service," he said. Mathias Johansson, Saudi Telecom Company's (STC) head of customer for Saudi Arabia and Egypt, agreed, noting that one of the driving factors behind the large number of eventual 5G subscribers in the region would be the availability of 5G enabled smartphones. STC and Ericsson signed in February a deal to deploy 5G technology in Saudi Arabia during the Mobile World Congress in Barcelona.

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SATELLITE NEWS

Globalstar Expands Usability of Satellite Hotspot

Globalstar, Inc., a provider of mobile satellite voice and data services, has announced the new Sat-Fi2® Remote Antenna Station (RAS), expanding the capabilities of the Sat-Fi2® Satellite Hotspot by incorporating a highly efficient remote antenna enabling use in any vehicle, vessel or distant building, the company said. Sat-Fi2® RAS easily installs to a fixed power source for seamless connectivity via the Globalstar next generation satellite network and ground infrastructure. Now available in the US and Canada, Sat-Fi2 RAS provides continuous communications for anyone who works or plays outside of cellular coverage. With Sat-Fi2 RAS, a satellite Wi-Fi hotspot is created so that users can stay connected while they are on the move. Ideal for users in a vehicle, a fishing boat or pleasure craft, or those who work from a remote stationary location. The solution includes two remote antenna options — a magnetic mountable antenna and a pole mountable marine antenna that addresses the demand for satellite communications on the water. Sat-Fi2 RAS uses the proven Sat-Fi2 suite of features, including the easy-to-use mobile app that works on multiple platforms including Gmail, iCloud, Exchange, Outlook, Hotmail and Yahoo! Up to eight users can connect any Wi-Fi-enabled iOS or Android device to Sat-Fi2 RAS for satellite-enabled email and SMS text message functionality, voice calls, access to the web, social media and S.O.S. (app supported) for emergency notification. For web access, users will experience faster text page load times through Sat-Browse, a built-in Internet compression and search engine technology allowing efficient and affordable access to web-based information. Globalstar is a provider of customizable Satellite IoT Solutions for customers around the world in industries such as oil and gas, transportation, emergency management, government, maritime and outdoor recreation. A pioneer of mobile satellite voice and data services, Globalstar allows businesses to streamline operations by connecting people to their devices, supplying personal safety and communication, and automating data to more easily monitor and manage mobile assets via the Globalstar Satellite Network.

Globecast Partners with Orby TV for Pay-As-You-Go Satellite Service

Globecast has signed a deal with pay-as-you-go satellite TV startup Orby TV to provide a range of turnkey broadcast media operational services. Orby TV launched in the lower 48 US states in spring 2019, with a mission statement to provide a high-quality and low-cost pay TV service with no contract and no internet required. This new deal will see the media solutions provider handle Orby TV's full broadcast operations on a 24/7 basis from its media centre in California. Globecast will manage Orby TV's channel aggregation using its fibre and satellite network, along with proving its co-location service, handling technical operations and uplinking channels to the Ku-band capacity on Eutelsat's EUTELSAT 117 West A satellite at 117º West. Orby TV has two base programming packages priced at $40 (Essentials) or $50 (Extras) per month for up to four rooms, with optional premium network programming packages and low-cost DVR service available. All fees and taxes are included in the monthly prices. Local channels and unlimited use of the Orby TV interactive program guide is provided at no additional charge, even if the subscriber decides to turn off the monthly paid Orby TV service. Michael Thornton, CEO of Orby TV, said: "Globecast is providing to Orby TV complete and comprehensive broadcast operations. Globecast has vast experience in media management, with extensive programmer relationships and excellent fiber and satellite connectivity. Its expertise and strong operational performance was vital to the successful early days for Orby TV, as our satellite service gains a foothold across the United States with consumers looking for a combination of quality lean-back television, low prices, and flexibility in managing their payTV services from month-to-month." Eddie Ferraro, managing director of Globecast Americas, said: "Orby TV has introduced a flexible pay-as-you-go model to the DTH marketplace and we are very pleased to have been selected as their technical services partner. We all know that new innovative ways of thinking need to be turned into reality across the pay-TV landscape in order to continue to drive consumer uptake, and Orby TV is doing a terrific job at that."

Vox Launches Uncapped Satellite Internet

Satellite connectivity in the South African market is set for a shakeup, with infrastructure provider Vox announcing the introduction of several capped and uncapped data and voice plans, made available through its partnership with Avanti Communications. "Ka-band satellite has been growing around the world; it's quick to install for end-users, and provides them with much higher throughputs as compared to other satellite technologies," says Jacques Visser, head of wireless at Vox. "Our partnership with Avanti helps us expand our existing Ka-band satellite services portfolio, bring new data and voice offerings to the South African market, and give our customers more choice." Based in the UK, Avanti makes use of its fleet of four Ka-band HYLAS satellites and ground infrastructure in Amsterdam, Frankfurt, Istanbul, Johannesburg, Lagos and London among others, to provide satellite connectivity to individuals and businesses in over 118 countries in Europe, the Middle East and Africa. "This partnership expands the coverage of our satellite services to more geographical areas, including the Northern Cape locally, giving us for the first time coverage on Ka-band across the entire country, as well as into much of sub-Saharan Africa," says Visser. According to Visser, the partnership with Avanti will allow Vox to offer an uncapped data plan, as well as several capped data plans. Subscribers to the capped data plans can add on an uncapped voice channel. While the uncapped data plan runs off the HYLAS 2 satellite, the capped data/uncapped voice plans run off the newer HYLAS 4 satellite with a local landing station in South Africa that reduces latency. Visser adds that increased promotional offers for data and voice plans, as well as consumer premise equipment (CPE) subsidies, are now making satellite services far more competitive against other forms of fixed, fixed-wireless, or wireless connectivity. This makes satellite a solution for users who are not in major urban areas that benefit from high-speed connectivity such as fiber or LTE-A. Products such as uncapped voice could have a positive social impact in rural areas of the country, as small businesses or farmers can now affordably provide their workers with free calls so that they can stay in touch with family and friends. As a result of increased reliability and stability, a growing number of businesses are also turning to Ka-band satellite services as a failover connectivity, or even to connect their software-defined wide area networks (SD-WAN). "Being able to offer our customers options such as high throughput uncapped data and uncapped voice plans, at this price point, is a game-changer for telecommunications in South Africa," says Visser. "Gone are the days when satellite internet was seen as a slow, expensive service." Data plans available through Avanti include an uncapped data plan for R1 999 per month, as well as capped data options, with 5GB for R399 pm, 10GB for R699 pm, and 20GB for R1099 pm. Capped data plan customers can further subscribe to an uncapped voice channel, which offers them unlimited calls to South African numbers, at R172 per month including VAT.

Ka-Band Connectivity for China's Aircraft

Ka-band satellite communications will drive an inflight connectivity agreement coming to the Chinese market. AirNet Technology Inc, an in-flight solution provider focusing on connectivity, entertainment and digital multimedia in China, has announced that one of its subsidiaries, Air Esurfing Information Technology Co Ltd, has signed a strategic cooperation agreement with Lufthansa Technik, a provider of technical aircraft services, to provide inflight connectivity retrofit packages to aircraft in the Chinese market. During the term of this agreement, Lufthansa Technik will design and certify Ka-band-based connectivity retrofit packages for both the Airbus A320ceo and A320neo aircraft families as well as the Boeing 737NG and 737MAX. Lufthansa Technik will also work with ARE to provide Civil Aviation Administration of China (CAAC)-validated European Union Aviation Safety Agency (EASA) Supplemental Type Certificates (VSTC) to support Chinese

airlines. Lufthansa Technik will also supply material and provide material handling services for the installation of packages that can be tailored to the specific requirements of airline customers of ARE. Lufthansa Technik's portfolio covers the entire range of services for commercial and VIP/special mission aircraft, engines, components and landing gear in the areas of digital fleet support, maintenance, repair, overhaul, modification, completion and conversion as well as the manufacture of innovative cabin products. Collaborating with its partners, AirNet offers Chinese airlines internet connections through a network of satellites and land-based beacons.

Kacific Secures Infrastructure Location with Petro1 for Its Broadband Services to Indonesia and the Wider Region

Kacific Broadband Satellites Group (Kacific) has selected PT. Petro One Indonesia (Petro1) to provide ground infrastructure services in Indonesia for its brand-new satellite, built by Boeing, which will launch at the end of 2019. Petro1 will host, operate and provide first level support for Kacific's gateway hub at its secure facilities in Surabaya and Pasuruan, East Java, Indonesia. The state-of-the-art primary gateway will include a 9-metre antenna and associated equipment to transmit and distribute data to and from the satellite. An additional diversity site, over 60 kilometers away, will ensure better availability and a redundancy capability. Petro1 will provide a high-grade, well-fibered secured data center environment for the system servers, 24/7 service care, which includes onsite service staff 24/7. The satellite's high-power beams cover Indonesia's many islands and surrounding ocean, delivering affordable, high-speed broadband to telecommunications companies, internet service providers and governments. This contract with local partners represents a multi-million dollar infrastructure investment into Indonesia by satellite operator Kacific. "Kacific chose to locate its ground infrastructure in Indonesia because it is a priority market for us," says Kacific CEO, Christian Patouraux. "Our high-speed broadband will supplement and augment the Government connectivity programs which aim to strengthen broadband infrastructure across the nation. Petro1 has a highly trained technical team and access to excellent facilities, which will ensure the optimal performance of the Kacific1 satellite in Indonesia." Petro1 CEO Marlina Sagaf says, "We are very pleased to have won the trust and business of Kacific for this long-term teleport hosting, support and the maintenance component of this remarkable high-speed satellite. Petro1 and Kacific will bring to the Indonesian people a great internet usage enabler to the entire Indonesian archipelago, especially for people and businesses in rural or remote locations. Together with Kacific, our Petro1 team intends to provide a robust and reliable high speed VSAT service from our earth station locations in Surabaya and Pasuruan." Internet penetration had reached 55 percent of Indonesia's population, serving 145 million people in the nation in 2017. Kacific1 covers remote islands and will help connect some of the estimated 119 million unconnected Indonesians. Kacific broadband will power services such as mobile backhaul for cellular networks and broadband internet over VSAT (satellite dishes under 1.5 metres) for small and medium-sized businesses. Its services will increase connectivity and internet access in areas that are beyond the economical reach of terrestrial infrastructures. Petro1 is a system integrator company with the main business focus in the area of ICT "Information Communication Technology" and telecommunication infrastructure for onshore and offshore businesses. Petro1 is well experienced in delivering an end-to-end service based on individual client's needs; from engineering design and procurement to construction and installation. Petro1 provides both VSAT and ISP services and other connectivity solutions (radio, fiber optic and GSM), surveillance security monitoring systems (CCTV, PAGA, navigation, telemetry) and facility infrastructures (network and data centers, hosting and co-location, cabling, power and termination systems).

Tunisia's Telnet to Launch First Home-Made Satellite in July 2020

Tunisia's first satellite, Challenge ONE, will be launched in July 2020 from the Russian-operated Baikonur Cosmodrome in south-central Kazakhstan aboard the Russian Soyuz-2.1A, reports Tunis Afrique Presse (TAP) news agency citing Telnet CEO Mohamed Frikha as saying. Challenge ONE is a scientific research and technology demonstrator satellite offering new concepts in information technologies and their practical applications. The small satellite is developed in-house by Tunisia's publicly traded engineering and technology consulting company, Telnet Group. "The satellite cost one million Tunisian dinars (about 349,825 U.S. dollars), while its global counterpart cost about 5 million Tunisian dinars (1.7 million U.S. dollars)," Frikka said. "We were able to control costs thanks to the technological resources of the Telnet group, which opened up new horizons for the space technology sector in Tunisia through cooperation with international partners," he added. On 1 April 2019, Telnet signed a contract with the Russian operator of commercial launches of Soyuz-2 rockets, GK Launch Services, for putting in space Tunisia's first satellite in 2020. Challenge ONE in-orbit operation will serve as a precursor mission for a constellation of 30 satellites. Telnet Group has already signed a tripartite deal with two Russian companies, SPUTNIX and GK Launch Services, for the launch of the 30-satellite constellation by 2023 for the development of a network of IoT applications.

The ESA's EarthCARE Satellite to Be Launched by Arianespace

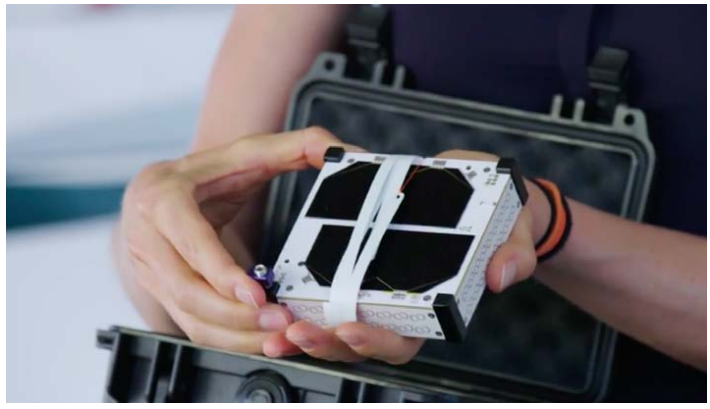
Arianespace and the European Space Agency (ESA) have announced the signature of a launch services contract with a Soyuz launch vehicle for the EarthCARE satellite. EarthCARE (Cloud, Aerosol and Radiation Explorer) satellite - the sixth mission in ESA's Earth Explorer program - will advance understanding of the role clouds and aerosols play in reflecting incident solar radiation back into space and trapping infrared radiation emitted from Earth's surface. Artistic rendition of ESA's EarthCARE satellite, which will advance understanding of the role that clouds and aerosols play in reflecting incident solar radiation back out to space and trapping infrared radiation emitted from Earth's surface. EarthCARE is a joint collaborative satellite mission conducted between ESA and the Japan Aerospace Exploration Agency (JAXA) that delivers the Cloud Profiling Radar (CPR) instrument. ESA is responsible for the entire system - including the Spacecraft, three instruments including ATmospheric LIDar (ATLID), a Multi-Spectral Imager (MSI) and a Broad-Band Radiometer (BBR), plus the Launcher and Ground Segment (with exception of the CPR data segment). The EarthCARE mission will use a Soyuz launch vehicle, with the launch period starting in June 2022 from the Guiana Space Center, Europe's Spaceport in French Guiana (South America). The satellite will have a mass at liftoff of approximately 2,350 kg and will circle Earth in SSO, crossing the equator in the early afternoon to optimize daylight conditions, at an altitude of 390 km. The altitude needs to be as low as possible to optimize use of both the lidar and radar, but not too low where atmospheric drag would impact fuel consumption and the lifetime of the mission. EarthCARE has a design lifetime of three years, including a six-month commissioning phase. The mission's goal is to provide a picture of the 3D-dimensional spatial and the temporal structure of the radiative flux field at the top of atmosphere, within the atmosphere and at the Earth's surface. The high-performance lidar and radar technology, plus the synergistic use of the different remote sensing techniques embarked on board EarthCARE, will deliver unprecedented datasets allowing scientists to study the relationship of clouds, aerosols and radiation at accuracy levels that will significantly improve our understanding of these highly-variable parameters. The ESA/JAXA EarthCARE mission will provide this information to improve predictions about the weather and future climate. The satellite prime contractor is AIRBUS Defence and Space (DE). Josef Aschbacher, ESA's Director of Earth Observation, said EarthCARE is built to better understand climate change by measuring clouds and atmospheric particles. It is a joint mission between ESA and JAXA, the Japan Aerospace Exploration Agency, demonstrating once more what international cooperation can achieve."

DES Ministry Panel Working on ToR for Private Satellite Operators

The Digital Economy and Society (DES) Ministry has expressed confidence that it can find companies that will operate services on satellites Thaicom 4, 5 and 6 before Thaicom's concessions expire in September 2021. The scheme will be carried out under the public-private partnership model. Thaicom is obliged to transfer all concession-related assets to the state when the concession ends. Ajarin Pattanapanchai, the DES permanent secretary, said the ministry's working group is in the process of considering terms of reference (ToR) for private operators to run the service. The ToR draft is expected to be completed by mid-2020. After that, bidders will be asked to submit their proposals. The ministry spent 6 million baht hiring Chulalongkorn University to study the draft conditions in relation to the satellite operation, Ms. Ajarin said. "ToR for the PPP projects in connection with three satellites should be finished by June next year," she said. The ministry's teams are updating which satellite assets have to be handed over to the state. Thaicom 4 is operated on the orbital slot at 119.5 East and Thaicom 5 and 6 at 78.5 East. The government plans to replace concessions with a licensing regime to promote liberalization of the industry while maintaining state benefits. The National Broadcasting and Telecommunications Commission (NBTC) took over regulating all related satellite businesses from the DES Ministry last year, according to the amended NBTC law. The DES Ministry recently wrote to the NBTC, asking if the ministry could help arrange orbital slots and satellite network filing for satellites throughout their lifespan to facilitate the procedure. Ms. Ajarin said the move would help ease bidders' concerns about regulatory issues. However, the request was shot down by the NBTC. Thanapant Raicharoen, Deputy Secretary General of the NBTC, said the agency acknowledged the concerns raised by the ministry. The regulator stands ready to award operating licences and rights for satellite network filing immediately to companies selected by the ministry under the PPP project, he said. Air Marshal Thanapant said the NBTC has finished three related regulation drafts for the satellite business: a master plan for satellite orbital slot rights, rules for licensing to use slots, and rules for using satellites owned and operated by foreigners. The NBTC plans a public hearing on the drafts on Oct 21, aiming for implementation by November.

Swarm Gets Green Light from FCC for Its 150-Satellite Constellation

Swarm Technologies aims to connect smart devices around the world with a low-bandwidth but ever-present network provided by satellites — and it just got approval from the FCC to do so. Apparently the agency is no longer worried that Swarm's sandwich-sized satellites are too small to be tracked. The company's SpaceBEE satellites are tiny things that will provide a connection to devices that might otherwise be a pain to get online. Think soil monitors in the middle of corn fields, or buoys in the middle of the ocean. Their signals don't need low latency or high bandwidth — so the requirements for a satellite that serves them are much lower than for consumer broadband. Consequently, Swarm's satellites are small — so small, in fact, that the FCC was worried that they would be difficult to track and might be a danger to other satellites. Part of the company's responsibility in its application was to show that isn't the case. The FCC approval is just one step in the long process of getting approved to go to space for commercial operations, but it's a big one. In addition to granting Swarm permission to send up its planned 150 satellites (and up to 600 if it decides to spread out a little), the FCC assigned Swarm the wireless spectrum it needs to operate. No use being in space if you're forbidden from transmitting on the frequencies you need, right? Longtime satellite communications provider ORBCOMM had objected that Swarm would be taking over some parts of the spectrum it has been assigned — but the FCC found that wasn't actually the case, and, in fact, the company was in a way making a sort of power play that would have extended its control over those frequencies. So their concerns were dismissed. SpaceX also filed a comment suggesting that Swarm had not adequately considered its orbital debris footprint, neglecting in particular to include its satellites' antennas in various calculations. It also said the satellites might be a risk to the International Space Station. But documents filed by Swarm addressing these questions seem to have satisfied the FCC completely — "We find that Swarm has taken the appropriate steps to address SpaceX's concerns," and it granted the application with the condition that the company abide by any upcoming orbital debris rules. Swarm has clearly moved well past the black mark on its FCC record when it launched test satellites without the proper approvals. The red tape involved in space operations is voluminous and it's not uncommon to fall afoul of it — especially when your competitors, as evidenced by the above, are making more of it for you. Now that it has its paperwork in order, Swarm plans to get its entire constellation in orbit by the end of the year. "The FCC grant of Swarm's spectrum and launch approvals is a big milestone for the company. Swarm is now poised to be first to market for an entire global satellite data communications constellation before the end of 2020," said CEO and co-founder Sara Spangelo in a statement to TechCrunch. "This is an important moment for the satellite industry, for US innovation in space, and for the large number of IoT customers world-wide that Swarm is excited to support with 2-way data services," added CTO and co-founder Ben Longmier.



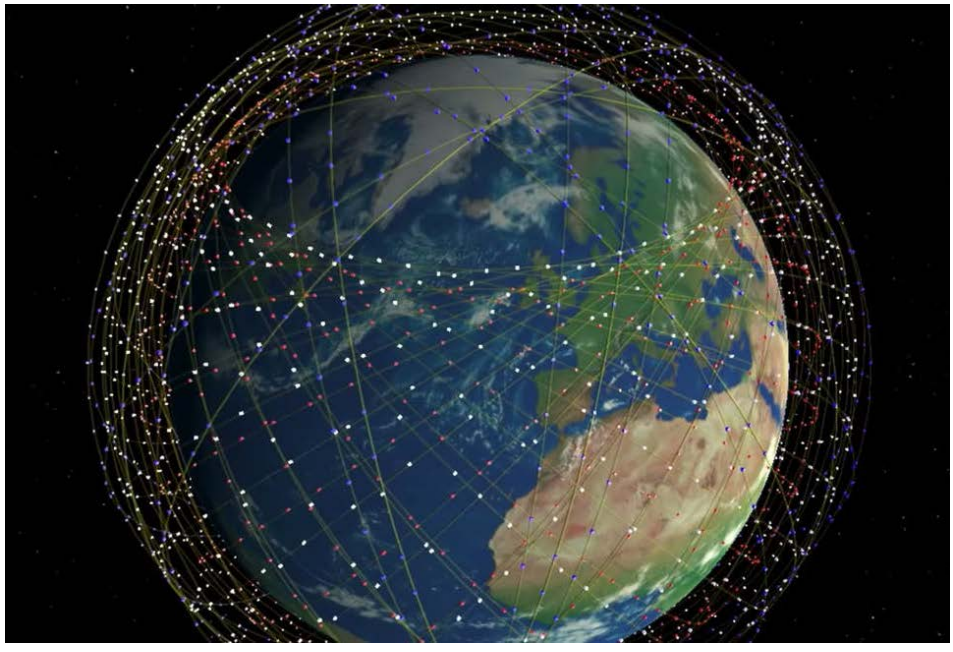
ESA Signs Arianespace to Launch the Earth Explorer Biomass Satellite

Arianespace and the European Space Agency have signed a launch services contract with a Vega launch vehicle for the Earth Explorer Biomass. This is the seventh mission in ESA's Earth Explorer program and will provide global maps of the amount of carbon stored in the world's forests and how it changes over time, mainly through absorbing carbon dioxide from fossil fuel burning, deforestation and change in land use. Biomass also will provide essential support to United Nations treaties on the reduction of emissions from deforestation and forest degradation. The Biomass mission will use a Vega launch vehicle, with the launch period starting in October 2022 from the Guiana Space Center, Europe's Spaceport in French Guiana (South America). Vega is part of the Arianespace launcher family, along with the Ariane 5 heavy launcher and the medium-lift Soyuz; all three are operated from the Guiana Space Center. The industrial prime contractor for Vega is Avio, based in Colleferro, Italy. The satellite will have a mass at liftoff of approximately 1,200 kg. and will be placed in a dawn-dusk, SSO at an altitude of 666 km. Forest type and forest cover worldwide can be detected by today's satellites, but Biomass will take the information to the next level. The satellite will carry the first P-band synthetic aperture radar (SAR), able to deliver accurate maps of tropical, temperate and boreal forest biomass in terms of tons/hectare with a resolution of 50 to 100 meters. The global mass of trees is not obtainable by ground measurement techniques. Other innovative applications that can be explored for the first time from space with the Biomass radar are the mapping of topography under dense vegetation and subsurface geology in deserts. Biomass will spend at least five years making detailed observations and witnessing at least eight growth cycles in the world's forests. Observations from this new mission will also lead to better insight into the rates of habitat loss and, as a result, the effect this may have on biodiversity in the forest environment. Airbus Defence and Space (UK) is developing and building the Biomass spacecraft using a bespoke structure embedding the AS250

avionics. The Explorer is based on the Astrobus Platform Line used, notably, on the following missions: SPOT6/7, KazEOSat-1, SEOSAT/Ingenio, PeruSAT-1 and Sentinel-5 Precursor. Following the contract signature, Josef Aschbacher, Director of Earth Observation at ESA, and noted that mapping forest biomass from space is a technical challenge as forests are complex structures. Nevertheless, the Biomass mission is up to the task and will spend at least five years in orbit, to deliver critical data to understand more about the carbon cycle and how our forest resources are changing. Stéphane Israël, CEO, Arianespace, added the company is proud to fly the Biomass satellite with Vega. Once again, Vega guarantees autonomous European access to space, enabling ESA to carry out a crucial mission as we face the challenge of climate change.

SpaceX Adds another 30,000 Satellites to Already Ambitious Plans

Elon Musk's grand plan to dominate the skies just became a lot grander as another application emerges, this time to add 30,000 satellites to the SpaceX constellation. Submitted to the ITU by the FCC on behalf of SpaceX, the paperwork would add scope for an additional 30,000 satellites on top of the 12,000 the company already has permission to launch. According to Space News, the FCC submitted 20 filings, each for 1,500 satellites at different low-earth orbits. In recent years, satellite connectivity has proven to be an unpopular means with many telcos in developed nations turning noses up at the idea. There was an attitude present in the industry that satellites were for poorer nations who did not control the same budgets, though the industry does seem to be coming around. At Mobile World Congress this year, several companies were touting their assets to the increasingly cash-strapped telcos. With the cost of investment in access infrastructure soaring, satellite is becoming a more popular feature of the connectivity patchwork to deliver services to those in isolated and inaccessible regions. It does seem the ambitious Musk is backing the continuation of this trend. Apparently 12,000 satellites isn't anywhere near enough. Interestingly enough, reports have also emerged SpaceX is in discussions with the US army for its Starlink broadband network. High-speed, low-latency communications are a no-brainer for the army, especially when you consider the global presence of the US army, though it does appear the team is in discussion for the Starship part of the business also. As it stands, SpaceX's Starship is currently working with NASA as a logistics partner after the space agency retired its space shuttle program. However, it is also suggested the army is interesting in Starship as a means to quickly move personal around the globe. The low-orbit satellite segment is certainly starting to heat-up, and this revelation should add more fuel to the fire. Alongside SpaceX, the likes of OneWeb, Space Norway, Telesat, and Amazon are also fighting for real-estate amongst the stars. Theoretically, the low-orbit satellites should offer greater levels of performance than traditional satellites, gigabit speeds and latency less than 25 ms, though pricing has not been unveiled by the providers. It is promising to see aggressive progress to enhance the rich tapestry of connectivity, but there are still significant hurdles to overcome. There are currently 5,000 satellites circling the earth, of which only around 2,000 are in operation. With some very wealthy companies launching tens of thousands of satellites into the skies, each will have to prove their plans to minimize debris and prevent collisions. As it stands, SpaceX has 60 satellites in the skies, which could be as many as 1,000 in the very near future. Considering there are only 2,000 currently in operation, the skies could become very busy in the very near future.



Russia Embraces New Satellite Tech for the Digital Economy

Moving into a digital economy with satellite at the forefront was one of the key themes to come out of SatComRus 2019, which was held in Saint Petersburg. One of the morning speakers was Igor Chursin, Deputy Head of Russia's Federal Communications Agency, who gave the Russian government perspective on the changing environment for satellite communications in Russia. Chursin said Russia stood at the threshold of digital convergence and a digital economy. He called it a "top priority" for the government and said the development of satellite communications in IT infrastructure was seen as "very important." He set out plans to improve satellite communications throughout Russia. "We have developed the business plan for highly elliptical satellites. So, in the next year, we will start producing and building satellites for highly elliptical orbits to be launched in 2023. We will not achieve high throughput in places such as the Arctic Circle without these kinds of satellites. In five years, the sunrise will start in the Antarctic (new services via satellite). We see high quality communication needs to be provided. We are seeing the growth of high-tech communications. Old technologies are gradually leaving the scene." Chursin added that over the next four years, connection to moving objects and broadband access will see a lot of growth. "We are on the verge of a technological revolution as we move all the way to 5G. We have things like Artificial Intelligence (AI) and Virtual Reality (VR). I am sure satellite communications will find an important place in the future." However, while this was positive, Chursin also struck a cautionary note adding that the government was not seeing enough breakthroughs in terms of costs of user equipment. "The satellite communications industry will be on the rise over the next seven years. We believe the market will change dramatically. Operators such as RSCC and Gazprom are in the front line of advances in the industry. 5G is making inroads into the system with lots of debates surrounding it, particularly with the allocation of frequencies." One of the other main speakers was Yuri Prokhorov, director general of RSCC. Significantly, RSCC now generates over half of its revenues from international market, rather than the domestic market, which is a major change. The company, which provides more than 60 percent of TV broadcasting in Russia, has been aggressively growing its international base. The company's highly elliptical satellite plans will be funded by the government. "We have an opportunity to provide good communications to any moving object," he said. Interestingly, the way RSCC is talking to suppliers is changing. "Normally, (when we go to meetings with satellite manufacturers) we described our vision of the future, but in the last meeting with Thales, the theme of the meeting was reversed, we asked Thales their vision of the future," said Prokhorov. However, while the operator has plans to develop highly elliptical orbits, Geostationary Orbit (GEO) will remain fundamental to its business plans with Prokhorov admitting that RSCC plans to commission 12 new spacecraft over the next 10 years in GEO. In terms of the 5G opportunity for RSCC, Prokhorov added, "5G will be the standard for Internet of Things (IoT). For satellite communications, the creation of new standards is important around 5G. The possibility of providing broadband access and delivery of media content are great products (for us)." Given that a lot of SatComRus was tackling the question of Russia's satellite future, some were predicting that the move to small satellites many not happen as quickly as some think. Nikolay Testoedov, Director General, ISS Reshetnev Company wasn't so sure that small satellites would be the next big thing. He said, "GEO satellites are in a difficult situation. However, in terms of satellites being provided faster and cheaper, there is no miracle. If you try to create a cheaper Ferrari, it will ultimately become more expensive than creating a normal Ferrari. Of course, all manufacturers want to have reconfigurable satellites," he said. Vincent Guermonprez, Telecom Sales Director of Russia and North America, Airbus Defense and Space, spoke of the trends from a manufacturing point of view. He added, "Digitalization is not only for the product but for the industrial process. I don't know if it will be a Ferrari, but we will offer cheap, quick products to get to market. We have presented these new products to RSCC. We hope what we are thinking will be useful for a lot of operators tomorrow." Nicolas Tenaud, Sales Director Russia and CIS, Thales Alenia Space, also spoke of the need for more flexibility and highlighted Thales Alenia Space's recent launch of Space Inspire product range of mid-sized satellites as a way of getting more business from the likes of RSCC going forward. With 5G on the horizon, speakers tackled the future video market in Russia. Nikolay Orlov, Tricolor, one of Russia's main pay-TV providers, admitted that that the modern world of communications and media consumption is changing before our eyes. He added, "A decision was arrived that an ecosystem should be put in place, and the user should be able to receive as many possible services from us. We are losing ground to terrestrial operators because we cannot provide access to the internet. Our ecosystem will definitely develop (as we look to cater to different customer needs)."

Satellite Players Sweeten US Spectrum Offer

The C-Band Alliance (CBA), a coalition of satellite service providers, strengthened a proposal to open key mid-band spectrum to US mobile operators, adding 100MHz of bandwidth to a prior offer. In a filing with the Federal Communications Commission (FCC), the group offered to make a total of 280MHz of spectrum between 3.7GHz and 4.2GHz (C-Band) available to mobile operators through a private auction. It pledged to make 100MHz of the total available in the top 46 metropolitan areas in the country within 18 months and the remainder within 36 months. CBA added it reached a consensus with major operators including AT&T, Verizon and US Cellular on guidelines for the proposed sale. The updated plan is a significant jump from the 180MHz CBA previously proposed: the group said it was able to increase its offer thanks to advanced technologies which improve the efficiency of satellite video delivery. The CBA's offer comes as the FCC scrambles to make mid-band spectrum available to operators for 5G deployments. The spectrum is in short supply in the US, but is considered critical for the next-generation technology because it offers a good balance of coverage and capacity compared with low-band or mmWave. Opening the C-Band would bring the country into closer alignment with others across the globe which have already earmarked the spectrum for next generation deployments. However, the move comes as pressure mounts on the FCC to hold a public auction for the band, rather than allowing CBA to manage the sale. Last week, US politicians introduced new legislation which would require the FCC to conduct a public auction of at least 200MHz of C-Band spectrum by 30 September 2022. The FCC is currently weighing its options, with a decision expected before the end of 2019.

RAF Pilot to Help Launch UK Space Force Satellite

Fifty years after the lunar landing the Royal Air Force is taking its first small steps into space. Flight Lieutenant Mathew Stannard will be the first RAF pilot to help launch a satellite as part of the Ministry of Defence's £30m space program. He will be swapping the cockpit of his RAF Typhoon jet for a heavier and slower Boeing 747. The specially adapted passenger plane has been designed to carry a rocket which can launch satellites into space. Working with the Virgin Orbit program in California, Flt Lt Stannard will be a pioneer of the fledgling Space Force. Speaking to the BBC in his first interview since being selected for the project, he said he was "very excited" to be joining a "very cool" space industry. He reminds me he is not going to be the UK's first person in space. Helen Sharman and Michael Foale preceded him along with, more recently, Tim Peake, who once served in the Army. But he will be the RAF's "first person to go along this route to be followed by many more". The MoD's spending on the space program is modest when compared with the billions of dollars already being spent by the US, China and India. But it is yet more proof that space is the new frontier and next frontline for defence. The RAF pilot notes that "it's the commercial sector leading the way". Historically, it has taken

a much larger rocket to launch a satellite from the ground, but Virgin Orbit aims to make it cheaper and quicker. Its specially adapted 747 named Cosmic Girl carries a much smaller rocket under its wing, which will be fired into orbit at about 30,000 feet. The rocket will contain a small satellite of about 300kg. Flt Lt Stannard said the unique selling point of Virgin Orbit is that it can be "launched from anywhere in the world" including the UK. The other game changer is the satellite technology. The one that he will fire into orbit next year will be the "size of a washing machine". The RAF already has a similar small satellite in orbit - launched conventionally from India last year. The UK-developed Carbonite 2 provides high quality video to the RAF and the plan is to have a "constellation" of these small satellites in orbit, providing high quality images, video and secure communications.

WHOLESALE NEWS

Cell C in 'Advanced Talks' with MTN for an Extended Roaming Deal

Cell C is said to be in advanced talks with MTN to gain more access to its network, Tech Central reports. CEO Douglas Craigie Stevenson was quoted as saying in an interview that an extended roaming deal – giving Cell C additional access to MTN's network in major cities such as Johannesburg and Cape Town – could be concluded within the next month, adding: 'We are not a tower-owning company, our profits have to come from the services that we are able to offer customers.' Further, the cash-strapped operator revealed that a group of local banks have committed to provide it with temporary liquidity by extending the maturity of a ZAR1.2 billion (USD78 million) loan, which was due to be repaid in September. The cellco had accumulated debt of ZAR9 billion by the end of 2018, while its full-year losses increased to ZAR8 billion (ZAR656 million in 2017). Cell C emerged from a protracted debt-restructuring rescue plan in August 2017, with Blue Label Telecoms taking a 45% stake in the company for ZAR5.5 billion, while 3C Telecommunications – itself owned by Oger Telecom (45.6%), the Employee Believe Trust (29.4%), and Broad-Based Black Economic Empowerment (B-BBEE) grouping CellSAf (25%) – retained a 30% stake. The remainder was split between Net1 (15%) and Cell C management and staff (10%). The restructuring process aimed to slash Cell C's debt to ZAR6 billion (from ZAR20 billion), though majority owner Blue Label fell short of its target by ZAR3 billion.

ACCC to Examine Affordability of 'Basic' NBN Products

The Australian Competition and Consumer Commission (ACCC) is launching an investigation into whether customers have access to 'basic' broadband plans at fair and affordable prices. Undertaken as part of an inquiry into wholesale charges for services offered over the National Broadband Network (NBN), the ACCC said it will examine wholesale prices paid by retails service providers (RSPs), with a specific focus on the charges levied for broadband plans offering downlink/uplink speeds of 12Mbps/1Mbps. According to the regulator, it will consider whether regulation is required to ensure 'a smooth transition for consumers to the NBN from legacy services such as ADSL'. It was noted that the inquiry will also assess whether NBN Co's most recent pricing offers – and specifically the latest changes made to its entry-level offering – will allow RSPs to market 'attractive retail NBN plans at ADSL-like prices'. Meanwhile, the ACCC said it remains concerned about NBN Co's continued use of discounts to adjust access prices, highlighting the fact that the company can withdraw these discounts ahead of a notice period that it sets itself. As such, the regulator has suggested that such arrangements may not be providing enough certainty for RSPs as they develop and promote their retail offers. Further, the regulator's inquiry will also reportedly look into NBN Co's service transfer and reversal charges, which are applied each time an existing service is transferred between access seekers; the ACCC has said it considers these charges can discourage the efficient use of service transfer processes, impeding competition and impacting consumers. With the ACCC saying that the inquiry will allow it to make a final access determination (FAD), should one be needed, ahead of the expiry of the current wholesale broadband agreement at the end of November 2020, it has released a discussion paper examining the issues and seeking views from interested parties.

Gabon and Congo Sign Mobile Roaming MoU

The heads of Gabon's Regulatory Agency for Electronic Communications and Posts (l'Agence de Regulation des Communications Electroniques et des Postes, ARCEP) and the Republic of Congo's Regulatory Agency for Electronic Communications and Post (L'Agence de Regulation des Postes et des Communications Electroniques, ARPCE) have signed a MoU to introduce free mobile roaming between the two countries no later than 31 December 2019, reports Adiac-congo.com. Under the agreement subscribers would pay no charge for incoming calls, up to a limit of 300 minutes per subscriber a month, outgoing calls would be billed at the local network operator's rates, while the higher of the two national rates would be applied for calls made to both countries. In order to ensure successful implementation of the agreement, the two regulators will both set up a national technical committee with the participation of all operators and establish procedures for the exchange of tariff and technical information.

Vodafone Becomes Latest AT&T IoT Roaming Partner

AT&T continued to push the boundaries of its IoT service coverage, building on a recent expansion to Canada through a roaming deal with Vodafone Business covering five European countries. The agreement around the operators' respective NB-IoT networks covers AT&T's domestic market along with Vodafone operations in Spain, Germany, Italy, the UK and Netherlands. In a statement, AT&T hailed the deal as creating the world's largest footprint for the narrowband flavor of IoT technology. It added the agreement makes it easier for businesses to use low-power IoT technology NB-IoT, with benefits around supply chain optimization and multinational access. "More and more of our enterprise customers are launching IoT applications across multiple countries," explained Chris Penrose, AT&T SVP of advanced mobility and enterprise solutions. "For the IoT to live up to its promise, it must be global," he added. Vodafone Business CEO Vinod Kumar highlighted ease of deployment for customers as a key benefit of the roaming agreement. "We want to make technology adoption simpler for our customers to help them achieve their business outcomes". The companies announced a similar arrangement involving their LTE-M IoT networks in the US and the Netherlands in February. AT&T followed up on this in June, with a deal involving Orange, Swisscom and KPN. Last month, AT&T secured LTE-M roaming deals with the three major operators in Canada, enabling it to offer access throughout North America.

ANCOM Confirms Mobile Termination Rate Reduction

Romania's National Authority for Management and Regulation in Communications (ANCOM) has announced mobile termination rates (MTRs) will be reduced to EUR0.0076 (USD0.0085) per minute with effect from 1 January 2020, down from the current rate of EUR0.0084, as a transitional measure until a single European rate is established before the end of 2020 under Directive (EU) 2018/1972. The operators designated with significant market power – Lycamobile, Orange Romania, Vodafone Romania, RCS&RDS and Telekom Romania Mobile Communications – will have the obligation not to exceed the maximum regulated rate on their own networks. The rate will apply to national calls and calls from inside the European Economic Area (EEA), as well as calls initiated outside the EEA where there is no international agreement in place governing termination fees.

Court Awards Big Telcos, Cablecos Temporary Stay over Wholesale Rates

Canada's Federal Court of Appeal has issued a temporary stay of a regulatory decision that seeks to force the country's largest fixed ISPs to offer smaller rivals lower wholesale access rates, reports CBC. In August the Canadian Radio-television and Telecommunications Commission (CRTC) ordered Bell Canada (including Bell MTS), Cogeco, Eastlink, Rogers, SaskTel, Shaw, Telus and Videotron to reduce wholesale tariffs, backdated to 2016. A group of six telcos/cablecos including Bell and Rogers asked the court to overrule the decision, resulting in the new wholesale rates being suspended whilst the case is examined.

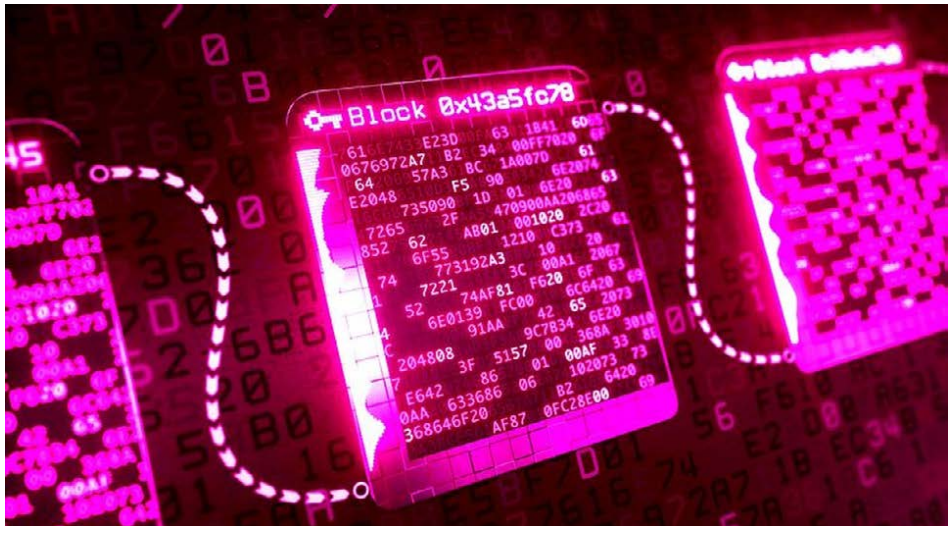
Orange Signs Global Roaming Agreement with Rakuten Mobile

The new company is claimed to the world's first end-to-end, cloud-native mobile operator and began trialing its network in major Japanese cities earlier this month. Orange's wholesale arm, International Carriers will provide LTE roaming and professional services to Rakuten Mobile, Japan's newest, fourth mobile network operator. Orange is to provide Rakuten Mobile's subscribers with international data roaming services around the world. The French operator group has mobile operations in 27 countries and will use a roaming solution to connect Rakuten directly with carriers in others countries via IPX network connection. The agreement also includes support from Orange professional services. Earlier this month, Rakuten Mobile launched a trial of its service. During the trial period, the service is available to only 5,000 people in Tokyo (Photo by Aleksandar Pasaric from Pexels), Osaka, Nagoya and Kobe. It will remain free of charge until the end of March 2020. According to Nikkei Asian Review, last week the Japanese e-commerce company, Rakuten, which is the parent company of the new mobile operator, has had complaints from almost 20% of the 4,500 customers taking part in the soft launch who have received SIM cards but cannot connect to the network. Rakuten Mobile said many of the connection failures are because customers are out of range, although some phones cannot connect to the network from indoor locations although they are within the coverage area. The company said it plans to have 3,432 base stations installed by March: a government-run website shows about 1,700 in place now.

TECHNOLOGY NEWS

Deutsche Telekom to Launch Blockchain-As-A-Service Marketplace

From 2020, Deutsche Telekom's subsidiary, T-Systems, will offer its new German Blockchain Ecosystem (GBE) product to business customers. Enterprises and SMEs will be able to map a product's entire value chain, from raw materials to delivery, using blockchain. T-Systems says this will make customers' operations faster, and more cost-effective and transparent. Businesses will also be able to trade, manage and invoice goods and services directly. "Detours via countless service providers will become a thing of the past," T-Systems said in a statement. "Blockchain knits together otherwise separate systems for production, services, trade and payment. This significantly reduces fragmentation along the value chain." The first product on the marketplace will be the Validator-as-a-Service solution, which allows cross-company processes to be checked and processed via a blockchain infrastructure. Adel Al Saleh, CEO, T-Systems, said, "The initial hype around blockchain has blown over. Today, no one doubts that this technology can open up new, decentralized business models." He added that blockchain could expand the Internet of Things to the 'Internet of Values'. "Please actively come forward with your application ideas for this important technological development. Together we can pave the way for the Internet of Values," he commented. "And best of all, companies no longer have to rely on central platform providers of major marketplaces. On the contrary. Our German Blockchain Ecosystem provides support to companies who want to manage their business models decentrally." Al Saleh said blockchain could be used to manage various types of assets and therefore have an impact in many sectors, including land, shares, patents, contracts, art, health data, passport information, financial transactions and supply chains. "The possibilities are almost unlimited," he said. The German Blockchain Ecosystem supports common Distributed Ledger Technology (DLT) protocols and integrates major cloud providers including the Open Telekom Cloud.



Sunrise Hits 3.67Gbps Downlink Speed on C-Band

Using 100MHz of C-Band spectrum, the test was performed in Sunrise's live commercial network with Huawei equipment. Achieving the 3.67Gbps downlink speed broke the partners' previous best of 2GBps. Sunrise provides 5G coverage in more than 262 cities and villages throughout Switzerland. "The continuous improvement of 5G network quality and performance will bring about more and more service innovations with broadband internet connections, offering more choice and convenience to people in Switzerland cities and villages," a statement from Huawei said. Huawei has previously called C-band (4 – 8 GHz) "the global golden spectrum of 5G". The vendor says its multi-user, multiple input, multiple output (MU-MIMO) technology substantially increases 5G capacity without additional spectrum and power resource requirements. "We believe that continuous large bandwidth (80-100MHz/operator) is the foundation of 5G commercial success," Xu Weizhong, Vice President of Huawei's Wireless Product Line, said earlier this year. He added, "Combined with 32T32R and even 64T64R-based Massive MIMO technology, it can reduce the cost per bit by 10 times, increase user experience by 10 times, and push MBB [mobile broadband] to new heights."

Chinese Trio Launch Commercial 5G Services

China Mobile, China Telecom and China Unicom have each confirmed that they have launched commercial 5G services. Each player has activated their network in 50 cities from launch, including the likes of Beijing, Shanghai, Guangzhou, Shenzhen, Hangzhou, Nanjing, Tianjin, Wuhan, Jinan and Zhengzhou. China Mobile notes that it has built more than 40,000 5G base transceiver stations (BTS) in 50 key cities and has carried out 5G network construction in more than 300 cities across the country. In 2020, the mobile giant will further expand its network coverage, with a view to providing 5G services to all cities above the prefecture level. China Unicom and China Telecom, meanwhile, have shared construction of BTS in 24 cities, as per an agreement signed on 9 September. Going forward, the two parties have suggested that the collaboration will represent the 'world's first and largest 5G joint construction and sharing network'.

Openreach Pilots New Techniques to Bring Fiber to Remote Areas

BT's access division, Openreach, is trialing new tools and techniques to bring fiber to the premises (FTTP) broadband to remote locations. The company says the pilot in the Lancashire villages of Hesketh Bank and Parbold will pave the way for a much bigger upgrade of rural homes and businesses in smaller, less accessible locations. Approaches being tested include a 'diamond cutter' trench-digging tool. The giant rotating circular blade with diamonds embedded in the metal coating on its edge can slice through pavements and roads leaving a neat channel into which the machine simultaneously feeds in tubing for fiber-optic cables. The tool can install 700 meters of cabling a day – more than 20 times the amount possible by a two-person team using drilling and excavation. Openreach says this could slash the time taken to deploy fiber by months. The company is also trialing 'remote nodes' – where fiber-optic cables can be built out from specially adapted existing green roadside cabinets. Equipment installed inside the cabinet enables full-fiber connections to extend their current reach by more than 1.5 times, with the capacity to connect more than 1,000 premises. By 'piggy-backing' on the existing network, Openreach says engineers can avoid up to six months in time and associated cost involved in deploying new fiber cables from an exchange to remote rural areas. Openreach said some homes and businesses could receive FTTP in time for Christmas. Once services are live, residents should see download speeds of up to 1 gigabit per second (1Gbps). Clive Selley, Chief Executive of Openreach, commented, "At Openreach, we'll never be just a city fiber provider. We've always worked hard to improve connections to isolated, less commercially attractive communities through inventive engineering and effective funding partnership models." He added: "In recent years we've been extending our full-fibre network into rural areas – mostly in partnership with local authorities and Government - but the economics are clearly challenging and we want to do more. We know that around 10% of the country will need to the support of public subsidy, but these trials will help us test a bunch of new techniques that could help us in other rural areas. "The trials will also give us a much clearer picture of what the technical challenges in these kinds of rural areas are. We hope they'll go a long way towards developing the tools, skills and innovations required to make sure that nobody's left behind in the full-fiber future." The pilot could make areas eligible that were less commercially viable for Openreach's 'Fibre First' investment program, "if the right investment conditions are met," the company said.

Deutsche Telekom Tests 5G Uplink at Berlin Marathon

During the Berlin Marathon, Deutsche Telekom (DT) successfully tested how high-quality TV images can be integrated into worldwide live reporting via 5G. At selected locations during the marathon, 5G smartphones were used as modems on professional cameras. They transported the camera images via DT's 5G network to the control room. DT reports that the test was successful as the pictures were "absolutely smooth and of perfect quality". The marathon's host broadcaster, Infront Productions, incorporated the test images into its worldwide live coverage. Tiana Trumpa, 5G Product Manager at Deutsche Telekom, said, "We want to make such applications possible with our 5G network. 5G takes data transmission to a new level. "The test in Berlin is an example of the possibilities that guaranteed uploads offer media companies. 5G offers production companies high quality and low latencies for live images." In future, DT said TV production companies may be able to save time using 5G and avoid costs associated with deploying additional connectivity infrastructure. They could also more easily incorporate crowd-sourced content into coverage. "Telekom's 5G network could enable transmissions with little effort and without complex technical setup on-site through production in the cloud. Another possible application is to include pictures and videos of fans in the transmission," a statement said. It added, "5G's quality features also allow high-quality content from private smartphones to be transmitted via the mobile network. Production companies can then use this content in their reporting. This allows viewers to be more intensively involved in an event and simply get closer to it." Last weekend O2, Telefonica's UK mobil unit and TV company ITN, used 5G to create what it claims the world's first live advert powered by 5G during the England versus Argentina match at the Rugby World Cup in Japan. They filmed fans' live reactions as little as five minutes before the half-time break during which the ad was broadcast to illustrate how 5G can revolutionize sports coverage, among other things. The advert was intended to highlight some 5G capabilities ahead of O2's official launch later this month.

SIM Card Shipments Set to Decline Further

Increased prices of mobile phones will contribute to the further decline of SIM card shipments, more so than eSIM adoption, according to ABI Research. Phil Sealy, research director at ABI Research, said: "The greater threat for the removable SIM card form factor in the shorter term is being presented by the handsets market. Mobile devices are becoming increasingly more expensive, some of which are now above the $1,000 mark. "As a result, consumers are looking to spread the cost of a device over a longer period. MNOs have also taken note and are beginning to lengthen subscription contracts from the traditional 18 and 24-month period, to 36 and 48 months. The increase in device life and contract lengths will reduce replacement rates and thus SIM card demand". SIM card shipments dipped for the first time in five years in 2018 when 5.53 billion SIMs were shipped. ABI predicts the SIM card market will contract from 5.2 billion this year to five billion in 2024. This year and 2018 saw many challenges for the SIM market in the APAC region. In China, roaming fees were relaxed which was the primary drive behind multiple SIM ownership. In Indonesia, ID card registration regulations were enforced. SIM card adoption dropped in India due to operators consolidating and ending 4G promotions. SIM card replacement rates will also be hit by the increased demand of eSIMs for hybrid smartphones such as the iPhone XR, XS, 11 and Google Pixel range. Continued growth is expected in M2M and IoT due to increasing eSIM integrations into automobiles. But Sealy said any eSIM impact on the market in the shorter term will be minimal. "The eSIM should be considered a longer-term market concern, with a reduction in SIM replacement rates driven more in the near term by increasing smartphone prices."

Malaysia Gears Up for 5G Demos across 6 States

Malaysia announced eight companies committed an initial investment of MYR116 million ($27.7 million) to run 5G trials, which will kick off in October and run for six months. With the goal of accelerating the deployment of 5G for businesses across various industries, Malaysian Communications and Multimedia Commission (MCMC) Chairman Al-Ishsal Ishak said 32 5G sites across six states will demonstrate 55 use cases involving nine verticals: agriculture; education; entertainment and media; digital healthcare; manufacturing and processing; oil and gas; smart cities; smart transportation; and tourism. Ishak said the projects will focus on cultivating the development of "a holistic and inclusive 5G ecosystem in pursuit of stimulating demand as well as adoption" of 5G technology for businesses and consumers. "We hope to commercialize some of the use cases beginning third quarter of 2020," he said. Ishak added that the support and investment from the participating companies "reiterates the industry's commitment in establishing a strong use for viable 5G applications that will transform various industries as well as impact positively the living standards of Malaysians". MCMC aims to attract additional investment for 5G development as well as proposals to enhance connectivity in the other states. The country's largest mobile operators – Digi and Maxis – last week detailed plans to increase infrastructure sharing to prepare for 5G, as they begin field trials and raise capex to support the new technology. Maxis has a 27 per cent share of mobile subscribers in the country, while Digi holds a 26 per cent share, ahead of Celcom Axiata's 22 per cent, Q2 data from GSMA Intelligence showed.

Al-Ishsal Ishak, Malaysian Communications and Multimedia Commission (MCMC) Chairman

5G Will Not Be 'the Network of Networks' For Enterprise Verticals

5G is being positioned as a "network of networks" that will encompass public and private components, licensed and unlicensed spectrum, and even expand beyond cellular, to satellite communications. But in reality, 5G will only be one component of the enterprise vertical technology stack, states global tech market advisory firm, ABI Research, in its new whitepaper, The Five Myths of 5G. "The telco industry has somewhat designed 5G as a technology that will complement, or even replace, several other competing communication technologies. This is, in fact, built into the standard: 5G includes eMBB, Ultra-Reliable Low-Latency Communication (URLLC), and Massive Machine Type Communication (mMTC) use cases. The first use case on this list, eMBB, builds on previous cellular generations, while URLLC can enable Time Sensitive Networks (TSNs), and can replace proprietary protocols and even Industrial Ethernet," explains Stuart Carlaw, Chief Research Officer at ABI Research. mMTC is positioned to unify cellular IoT technologies into one system and introduce connectivity for millions of different types of IoT devices. In theory and according to its specification, 5G will enable connectivity that ranges from low power, low data rates, to ultra-high bandwidth and low latency, all under one system. "From a pragmatic viewpoint, 5G will be another component in a patchwork of communication technologies and will certainly add unique value. However, it will not be the "network of networks" the telco industry is currently discussing," says Carlaw. Enterprise verticals—just like the telco industry—have their own established supply chains and families of communication technologies. "Enterprise vertical end users prefer "function over form," focusing on practical requirements, rather than insisting on standardized technologies. It is true that 5G can introduce a more cost-effective base (especially for chipsets and devices), but this will only materialize when enterprise verticals establish a critical mass for 5G and, in turn, economies of scale." This may not happen, especially in the first 5 years of 5G, when the telco supply chain adapts to the requirements of enterprise verticals. This may also mean that 5G will miss the enterprise digitization wave that is currently sweeping many markets, especially if the telco community does not act immediately. Telco operators and the infrastructure supply chain must build enterprise vertical expertise and partner with specialists when it is not necessary to organically grow this expertise internally. "5G will only be one component of the enterprise vertical technology stack, and larger than connectivity only if the telco value chain builds expertise for each vertical separately," Carlaw concludes. These findings are from ABI Research's The 5 Myths Of 5G report. This report is part of the company's 5G Industry research service, which includes research, data, and ABI Insights.

Spark, Vodafone NZ Introduce 5G Service

New Zealand's two largest operators Spark and Vodafone kicked off limited 5G launch and testing. Spark New Zealand turned on 5G service in Alexandra for a limited number of enterprise and consumer customers, with plans to expand the next-generation network to an additional five towns before the end of the year and other locations in early 2020. The operator's 5G network in Alexandra, Central Otago, runs on the 2.6GHz band and uses Nokia's 5G radio equipment, including a smart antenna system. Mark Beder, Spark's technology director, said: "We're pleased to be able to deliver 5G over the 2600MHz spectrum in Alexandra as it is a great way to demonstrate the possibilities, but our preference will always be C band (3500MHz) as we believe this will be the primary spectrum band for mass deployment of 5G. Acquiring enough C band spectrum is an important requirement for all wireless network operators." The move to switch on 5G comes as Spark completes an upgrade across its wireless network, with the capacity increased about 80 per cent over the past two years. "For over a year we've been working hard to prepare for 5G, including adding over 150 new mobile sites and extensively upgrading our existing network to 4.5G, to take advantage of the more efficient use of spectrum and greater capacity that 4.5G provides. We've now reached the point where invited customers can start experiencing some of the real benefits of 5G," Beder said. Spark continues to see 50 per cent year-on-year data growth. Meanwhile rival Vodafone New Zealand started 5G testing at Addington Racecourse in Christchurch, where a mobile cell site was upgraded by Nokia with 5G-enabled antennas. It follows tests on five sites, located in and around Mangere in South Auckland. The operator plans to switch on its commercial network in December, when it aims to have 100 sites around New Zealand upgraded to 5G. Sharina Nisha, Head of Platforms at Vodafone New Zealand, said: "Our network build has been progressing well and we're pleased to announce that testing for our first South Island 5G site is underway." Nisha said it will upgrade a number of existing cell sites in Christchurch over the coming months, which will include both 5G and 4.5G technology installations.

T-Mobile Testing 700MHz 5G in The Hague and Elsewhere

T-Mobile Netherlands says it will launch 5G 700MHz testing on 2 October in various parts of the country, having received a twelve-month national 2×10MHz test permit plus a two-month test license for The Hague with wider bandwidth. T-Mobile will be studying performance of 5G 700MHz services, including interoperability with its existing network, in cities and rural areas plus the North Sea. The operator is also opening three 5G test environments in The Hague: at its headquarters, in the Scheveningen district and at the Central Innovation District. The 700MHz band is being freed up for commercial mobile usage from the start of 2020 via the migration of digital TV spectrum, with a license auction scheduled for early in the year.

KPN Testing 700MHz, 3500MHz, 26GHz 5G Connections

KPN of the Netherlands has tested 3.5GHz 5G connectivity between multiple locations, completing data sessions and voice/video calls on 5G smartphones between its 5G indoor network in the Johan Cruijff Arena in Amsterdam, its 5G FieldLab in the Port of Rotterdam and the KPN Technology Lab in The Hague. In the tests – using Samsung Galaxy S10 5G, Huawei Mate 20 X and Oppo Reno 5G smartphones – a peak download speed of 1.3Gbps was recorded. Note that in the north of the country only limited indoor test usage of the 3.5GHz range is currently permitted as the band is penciled in by the government for a late 2021/early 2022 license auction but doubt remains as to whether the spectrum will be freed up from its existing usage by the Joint Sigint Cyber Unit (JSCU) of the General Intelligence & Security Service (AIVD) and Dutch Military Intelligence & Security Service (MIVD). Additionally, KPN's press release adds that 'since the beginning of October' it has been testing 5G 700MHz frequencies 'nationwide' and intends to test 'the first available handsets' using 700MHz frequencies 'soon'. The 700MHz band will be available commercially in the Netherlands from early 2020 via an upcoming 5G license auction. KPN also says it will start 26GHz 5G tests in Amsterdam in the short term. The government has not yet indicated a timescale for issuing 26GHz 5G licenses.

REGULATORY NEWS

ITU World Radiocommunication Conference (WRC-19) to Play Pivotal Role in Tomorrow's Digital Environment

The World Radiocommunication Conference 2019 (WRC-19), Sharm el-Sheikh, Egypt, 28 October – 22 November 2019, will address requirements for some of the leading edge technological innovations set to play a pivotal role in tomorrow's digital economy with immense implications for the trillion-dollar telecommunication and ICT industry. It will be preceded by the Radiocommunication Assembly 2019 (RA-19), 21 – 25 October 2019.

What: World Radiocommunication Conference (WRC-19)

When: 28 October – 22 November 2019, preceded by Radiocommunication Assembly (21-25 October 2019)

Where: Sharm El-Sheikh, Egypt, International Congress Centre (SHICC)

Why: The World Radiocommunication Conference, held every three to four years, is mandated to review and revise the Radio Regulations, the international treaty governing the use of radio-frequency spectrum and satellite orbits. WRC-19 will facilitate the management of scarce orbit/spectrum resources in the interest of end-users, with global implications for both policy-makers and the industry. Radiocommunication Assemblies (RA) are responsible for the structure, program, and working methods for the development and approval of radiocommunication-related Recommendations, Reports and Handbooks. They normally convene every three or four years and precede World Radiocommunication Conferences (WRCs).

Who: Over 3500 participants from 193 ITU Member States along with 267 members of the ITU Radiocommunication Sector (ITU-R) representing international organizations, equipment manufacturers, network operators and industry forums who attend as observers.

Unlocking human potential with technology of the future

The World Radiocommunication Conference will facilitate new innovations in mobile technology, identifying additional frequency bands for the future development of International Mobile Telecommunications (IMT) and further enabling the rollout of IMT-2020 networks, otherwise known as 5G.

Among a host of other items on the agenda, the conference will:

Update and modernize the Global Maritime Distress and Safety System (GMDSS) and expand geographical coverage, including in Polar Regions.

Ensure that Earth exploration and meteorological-satellite systems continue to provide environmental monitoring, prediction and mitigation of the negative effects caused by climate change as well as monitor the earth's resources.

Consider additional frequencies for earth stations in motion (ESIM) communicating from aircraft, maritime vessels and land vehicles with satellites on the geostationary orbit (GSO).

Enhance the international regulatory framework to improve satellite broadband connectivity from new non-geostationary satellite systems composed of multiple, multi-satellite constellations.

Allocate frequency bands for High-Altitude Platform Stations (HAPs) – aircraft positioned in the stratosphere for very-long-duration flights used for telecommunications, emergency/public safety communications, intelligent transportation systems, maritime surveillance, and environmental monitoring.

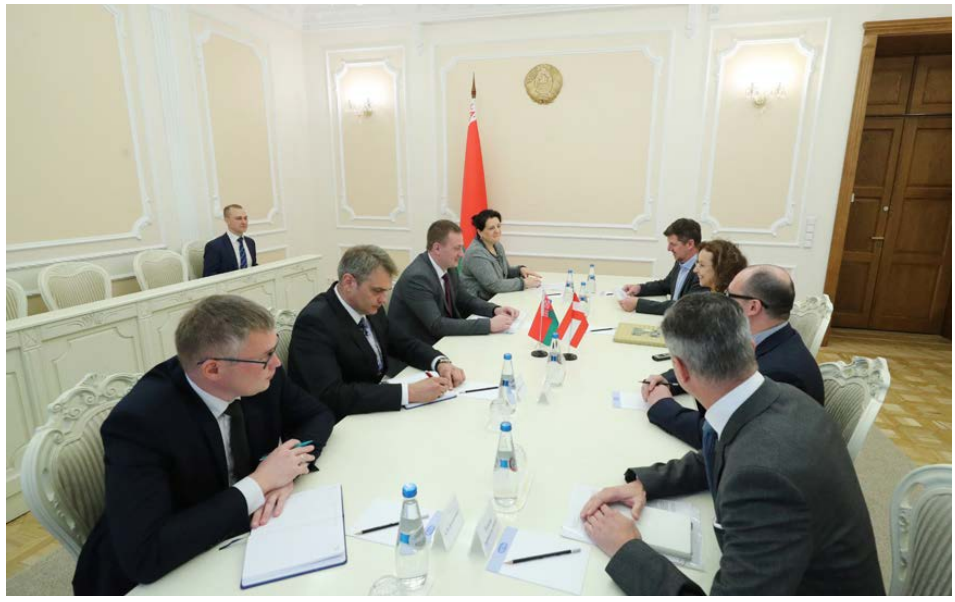
Facilitate radiocommunication systems between train and trackside systems to meet the demands of a high-speed railway environment.

Provide effective communication for portable and mobile computer-based equipment over Wireless access systems, including radio local area networks (WiFi).

The conference will also unlock great potential for human progress advancing many of the United Nations Sustainable Development Goals (SDGs). It will provide the tools for effective climate action, forge pathways for better access to health care, foster sustainable agricultural practices and reduce poverty and hunger, improve energy efficiency, facilitate Intelligent Transport Systems and machine-to-machine communications, make cities smart and communities more sustainable, foster safer travel on land, on air and at sea, and allow countries to participate in the digital economy by providing access to faster and more affordable broadband connectivity, especially in currently underserved communities.

Government of Belarus Considering Various Options for 5G

The government of Belarus is considering several options for building out a 5G network in the country, and to that end has welcomed proposals from Austria-based A1 Telekom Austria Group – owner of domestic cellco A1 Belarus (formerly VELCOM). First Deputy Prime Minister of Belarus Aleksandr Turchin informed Ambassador Extraordinary and Plenipotentiary of Austria to Belarus, Aloisia Worgetter, of the government's position at a recent bilateral meeting in which the subject of A1 Telekom was mentioned. According to Turchin: 'In my opinion, only the matter of the development of the 5G network remains undecided. The Belarusian government is looking into various options for building this network. A proposal has been made by A1. Another has been made by MTS Belarus. This is why we intend to discuss these options soon in order to work out some decision and understand in what direction we are going to move.' Further, the minister assured Ms. Worgetter that the Belarusian administration would consider all options on the table, adding that the government 'would be grateful if A1 presented a well-reasoned explanation why their proposal is the best one'. TeleGeography's GlobalComms Database writes that in August 2013 the Ministry of Communications and Informatisation (Minsvyazi) issued a license to joint venture Belarusian Cloud Technologies (beCloud) to operate in the country's communications market as a wholesale infrastructure access provider – initially via a communal 4G LTE network that now covers more than 75% of the population. In July 2018, meanwhile, Belarus' Operational and Analytical Center (OAC, a body working under the Office of the President), beCloud and Turkish telco Turkcell held strategic talks concerning the development of 5G services in Belarus. One area under discussion centered on boosting mutual cooperation between Belarus and Turkey in the field of telecommunications and IT, as well as the prospects for beCloud and Turkcell – which owns an 80% stake in the country's third largest mobile operator BeST (life:)) – to work together in future. beCloud went on to launch the first experimental zones for 5G in Minsk, in December 2018, working in partnership with Ericsson of Sweden.



FCC Chief Says 5G Security Message Resonates Abroad

Federal Communications Commission (FCC) Chairman Ajit Pai argued US operators' ability to launch 5G using equipment supplied exclusively by approved vendors proves other countries do not need to sacrifice security to achieve strong next generation networks. During the opening keynote, Pai said messages on 5G security had been "very well received" during his frequent visits abroad to promote the country's stance on the issue. These trips have come alongside a US campaign to persuade authorities to ban use of equipment from vendors it deems a security risk, most notably Huawei. "We are not going in and demanding anyone shares our view. In many cases we found that view has been shared and [authorities overseas] are looking forward to working with us, especially some of our closest security partners." He noted the fact 5G networks are likely to be largely software defined will offer a "broader attack surface" with a need to "make sure we mitigate the risks on that surface as much as possible". "Sometimes the conversation presents a false dichotomy that you have to either choose security or you have to choose leadership in 5G, and the argument I use as a counterpoint is look at the US experience," Pai added, noting domestic deployments only use equipment from "trusted vendors". He continued: "We think we can hit the sweet spot of both security and deployment, and that's a message that's resonated largely around the world as other countries have looked to piggy back on that successful model."

Bangladesh Pushes to Resolve Operator Tax Dispute

Bangladesh's telecoms regulator, after intervention by the Prime Minister's ICT adviser, agreed to set up a special committee to examine tax claims, its latest move to resolve a long-running dispute with the country's two largest mobile operators. Following a meeting with Grameenphone and Robi Axiata, the Bangladesh Telecommunication Regulatory Commission (BTRC) also said it would lift show-cause notices issued in early September, requiring operators to explain why they should keep their licenses despite failing to make payments. This is due to happen after they make yet-to-be-determined deposits, which are being negotiated. Sources told Mobile World Live (MWL) all parties also may sign an MOU. The committee will comprise representatives from the operators, BTRC, National Board of Revenue (NBR), Telecom Ministry and Finance Ministry. It has a target of releasing a report within three months. Following an audit started in 2017 of the companies' finances dating back to 1996, the BTRC claims the operators owe a combined BDT135 billion ($1.6 billion): BDT126 billion for Grameenphone and BDT8.67 billion for Robi Axiata. Both sought injunctions against orders to collect the fees. This week, GSMA director general Mats Granryd urged ICT Affairs Adviser Sajeeb Ahmed Wazeb to press the government to "seek to ensure BTRC is able to reconsider its stance on this matter", after the government detailed plans to appoint administrators at both operators to recover the unpaid taxes. The parties appeared to be moving towards a settlement last month, but it seems operators were unable to halt legal action, which was a condition of any resolution. Grameenphone stated it continued to engage with authorities to reach a transparent and amicable resolution.

UK Operators Forge £1B Rural Coverage Deal

The UK government accepted a proposal by operators to pool resources to address 4G coverage gaps in rural areas, in a deal worth more than £1 billion designed to deliver access to 95 per cent of the country by 2025. Terms of the plan, which foresees extending coverage to 280,000 additional premises and 16,000km of roads in the countryside, are not yet finalized, with a formal agreement expected early in 2020. Stated as a world-first in the industry, the deal would result in all four operators investing in a shared network of new and existing masts to "close almost all partial not-spots, areas where there is currently only coverage from at least one, but not all, operators". The plan outlines an investment of £530 million by EE, O2 UK, 3 UK and Vodafone UK, with the government committing up to £500 million to ensure the agreement also includes areas currently not covered by any operator. As part of the deal, the UK government would also allow operators to access infrastructure built as part of an Emergency Services Network deployment, which would deliver up to an additional 2 per cent of geographic coverage per operator in rural locations. Officials expect the greatest coverage improvements to be felt in Scotland, Wales and Northern Ireland. "Brokering an agreement for mast sharing between networks alongside new investment in mobile infrastructure will mean people get good 4G signal no matter where they are or which provider they're with", UK digital secretary Nicky Morgan said. Vodafone UK CEO Nick Jeffery said by working together, operators "will deliver better coverage while offering more choice for consumers and businesses, using

far fewer masts". Telefonica UK (O2) chief Mark Evans, described the deal as a "step-change in the way that mobile coverage is delivered", adding the proposal is "the most ambitious solution" of a number of options considered. David Dyson, CEO of 3 UK, said 9.3 million people stood to benefit from the deal which, in addition to boosting coverage, would provide rural consumers with "a similar choice as those living in towns and cities". And Marc Allera, CEO of BT's Consumer division, said the plan would remove "the key barriers to tackling the tricky not-spot problem, ensuring people and businesses right across the UK get access to the digital connectivity they need".

Hong Kong Prepares for Latest 5G Sale

Hong Kong's Office of the Communications Authority (OFCA) has confirmed that the four incumbent cellcos have qualified to bid in its latest 5G spectrum auction. Following on from sales of 3.5GHz and 4.9GHz licenses, the territory is now offering 100MHz of spectrum in the 3.3GHz band. China Mobile Hong Kong (CMHK), HKT, Hutchison 3 and SmarTone will all compete for licenses. All four firms won 3.5GHz concessions, while only CMHK and HKT bid for 4.9GHz permits.

Germany Successfully Trials 5G Broadcast

The participants of German research project 5G Today, in which linear TV was transmitted in 5G broadcast mode for the first time, have drawn a positive conclusion. "We were able to achieve good mobile TV reception in large parts of the measurement area. These findings form an important basis for further standardization work on 5G broadcasting," said Aneta Baier, project manager at German broadcast technology research institute IRT. The aim of the field trials, carried out on two transmitter sites in federal state Bavaria, was to examine the efficient distribution of TV channels for reception on future mobile 5G devices such as smartphones and tablets. 5G Broadcast offers advantages like high video quality, low latency and cost-effective distribution with high coverage, according to the 5G Today partners. The project, funded by the Bavarian Research Foundation, has been running since 2017; it is scheduled to end on October 31, 2019. The participants IRT, Kathrein, Rohde & Schwarz and associated partners Bayerischer Rundfunk and Telefónica Deutschland jointly investigated the possibilities of a 5G-based broadcast solution. The project covered the development of components for transmission and reception technology, preliminary examinations, simulations and field measurements. In addition, various antenna polarizations were investigated, especially for reception on smartphones. Due to the new status of the utilized LTE/5G broadcast mode FeMBMS, detailed research on the synchronization behavior and the resulting supply quality is still necessary, according to the partners. They have therefore agreed to continue the work started with 5G Today and to operate the test field beyond the planned duration of the project. Nevertheless, the participants conclude that the field measurements of 5G Today have shown that FeMBMS can achieve the characteristics of a classic broadcast transmission system.

BTRC Aiming to Cover the Whole Country with 5G by 2026

The Bangladesh Telecommunication Regulatory Commission (BTRC) is aiming to have all district headquarters in Bangladesh covered with 5G technology by 2021, The Daily Star writes. Md. Shahidul Alam, director general for spectrum management at the BTRC, said: 'The service will be available by the last quarter of next year or the first quarter of 2021.' A committee formed by the commission is working to formulate the guidelines and fix the price for the spectrum in the 2.6GHz and 3.5GHz bands in consultation with the government by Q1 2020, and allocate licenses to mobile operators by Q4 2020. The entire country (up to upazila level, including growth centers and railway stations) will be covered with 5G by 2026 as per the regulator's plans.

French Government to Reallocate EUR140m to Support FTTP Rollout

The French government has announced that EUR140 million (USD156 million) of cost savings from the country's national superfast broadband strategy – dubbed 'France Tres Haut Debit (THD)' – will be reallocated to support the next phase of the fiber-to-the-premises (FTTP) rollout, reports Les Echos. Secretary of State Agnes Pannier-Runacher confirmed that any savings made will be 'immediately recycled to finance more lines', adding the government will 'make funding available for 25 departments that still do not have widespread fiber-to-the-home'. The EUR3.3 billion program, which aims to provide 30 million homes with access to ultra-high speed broadband services by 2022, is reported to be on schedule and under budget. Despite the network now passing around 16 million homes, with an additional four million premises being added each year, Ms. Pannier-Runacher noted that three million people in difficult to access areas are yet to benefit from the program. However, she believes further cost savings will mean there is no need to extend the program's original budget. It is thought an additional EUR400 million to EUR500 million will be required to complete the project.

GSMA Head Backs Consolidation for 5G Boost

GSMA Director DGeneral Mats Granryd called on regulators to approve operator consolidation efforts, arguing such transactions are necessary to drive investment in next generation networks. In a keynote, Granryd noted operators in North America are expected to spend more than $380 billion on mobile networks in the coming years, adding "we should look to support this however we can". Approving consolidation efforts would bolster such investments while maintaining market competition, he said. The comments came as operators T-Mobile US and Sprint continued a battle for approval of a proposed merger despite opposition from state officials. The pair successfully overcame the objections of two opponents, however 16 attorney generals remain party to a lawsuit aiming to block the deal. Granryd also pressed regulators to level the playing field between operators and internet companies by implementing equivalent rules for all digital services, and called for harmonized international privacy and data protection laws. He reiterated the need for regulators to offer more spectrum to operators at a reasonable cost, noting "it is only the mobile industry that can deliver" the connectivity needed to enable new use cases and economic opportunities. "Our message to governments worldwide has been simple: don't get short-term greedy and kill the long-term golden goose." Granryd said a combination of 5G, AI and big data will fundamentally "transform the way we live, the way we work and the way we do business". In addition to serving new enterprise, industrial and entertainment use cases, he said intelligent connectivity offers the potential to enhance personal and professional relationships, and transform verticals including education and healthcare. For instance, he noted big data can be used to analyze human movement patterns to predict where disease outbreaks will happen, allowing health officials to launch awareness campaigns and treatment centers before the flare-up takes hold. Using tuberculosis as an example, Granryd said such an initiative could save more than 100,000 lives every year.

UKE Eases Regulation on Orange Polska in a Further 75 Markets

Orange Polska has been exempted from regulation in a further 75 municipalities due to sufficient levels of competition in the market for local loop access. The Office of Electronic Communications (Urzad Komunikacji Elektronicznej, UKE) says the incumbent is now free of regulation in 151 markets across the country. Orange spokesperson Wojciech Jabczynski commented: 'This is a wise decision for the market and customers. We are glad that the regulator is boldly moving away from archaic regulations in favor of pure competition, where operators are fighting for customers with investments, quality of services and price.' He added that increased competition and lighter regulation is pushing telcos – including Orange – to improve their networks and services in order to attract new customers and retain existing users.

ACM Develops Infrastructure Sharing Guidelines Ahead of 5G Auction

The Netherlands' Authority for Consumers & Markets (ACM) has announced that it will publish new guidelines for infrastructure sharing in February 2020, ahead of the upcoming 5G spectrum license auction for the 700MHz/1400MHz/2100MHz bands. Henk Don, ACM board member, stated: 'With the guidelines we want to offer clarity to the parties on the mobile market and thereby contribute to a smooth rollout of 5G.' Following discussions with sector players, ACM aims to clear up uncertainty over conditions governing shared rollouts, for example in economically unprofitable areas. Other topics to be addressed include the potential for renting/leasing spectrum, and preconditions for a cellco to use a rival's 2G/3G network after switching off its own in the transition to 5G.

Australia to Auction 26GHz Spectrum in Early 2021

The Australian government has announced plans to auction 2.4GHz of spectrum in the 26GHz band with a view to supporting 'a fast and efficient rollout of 5G across [the country].' In a press release regarding the matter – issued by the country's communications minister Paul Fletcher – it was noted that the frequencies in question are expected to be sold at a competitive auction which will take place in early 2021. Mr. Fletcher confirmed that he had this week issued a spectrum reallocation declaration for the 26GHz band, consistent with advice from the Australian Communications and Media Authority (ACMA), which he said had been informed by extensive industry consultation. The 'Radiocommunications (Spectrum Reallocation—26GHz Band) Declaration 2019' will reportedly enable the ACMA to reallocate spectrum in the 26GHz band (25.1GHz-27.5GHz) across 29 Australian cities and regional centers in order to accommodate new wireless broadband services, including 5G, under spectrum licensing arrangements. Meanwhile, it was noted that, in order to evaluate the potential for co-existence between NBN Co's Sky Muster satellite services and 5G mobile broadband services in the 27GHz-27.5GHz frequency range, the Department of Communications and the Arts (DCA) has commissioned a report by an independent consultant. Commenting on the spectrum sale plans, Minister Fletcher said: 'The Morrison Government is allocating this spectrum to support a number of important communications policy objectives, including the rapid deployment of 5G technologies, the promotion of competitive market outcomes, and encouraging investment in infrastructure across both metropolitan and regional Australia … Making this spectrum available means that the Australian telecommunications industry can do what it does best – provide world-class telecommunications services for consumers, small businesses and enterprises. 5G will deliver speeds significantly faster than 4G and at much lower latency.'

Antitrust Regulator Lifts Altice Restrictions in Regard to Numericable-SFR Merger

France's Competition Authority (Autorite de la Concurrence) has lifted all restrictions imposed on Amsterdam-based Altice Europe (previously Altice Group) in October 2014, when its subsidiary Numericable acquired mobile network SFR. The authority said that it opted not to extend the subscribed commitments for another five years, as it concluded that competition between operators was sufficient, particularly in regard to fiber. Following the lifting of the restrictions, Altice is no longer required to provide access to its network at pre-merger rates. However, a separate injunction imposed on Altice Europe in March 2017 in relation to the 'Faber' co-investment project (inked between SFR and Bouygues Telecom in November 2010, before the former was acquired by Altice and merged with Numericable) remains in place. The Faber deal aimed to increase fiber-optic deployments in 22 densely-populated municipalities, though the Autorite de la Concurrence ruled that following the Numericable-SFR merger, the 'pace of the connections slowed noticeably … running substantially behind the agreed schedule', thus negatively affecting Bouygues Telecom. Along with imposing a fine of EUR40 million (USD42.7 million), the competition authority has created a new deployment schedule aiming to ensure Altice carried out its commitments, with periodic penalty payments if it failed to do so.

Four Ukrainian Cellcos, PM Sign Memorandum on Total Coverage

Ukrainian GSM/3G/LTE mobile network operators Kyivstar, Vodafone Ukraine and Lifecell, alongside 3G CDMA operator Intertelecom, have signed a memorandum with Prime Minister Oleksiy Honcharuk on covering the entire territory of Ukraine with high-quality, high speed communications networks, Interfax reported. Mr. Honcharuk declared: 'I believe that the total digitalization of the country will begin with this document. Every corner of our country should have affordable, high-quality internet and communications. And we, in the government, with the president and with our partner companies will do everything necessary for this.' The new government formed following July's snap election has promised to implement 'total digitalization' of the country under a wider goal of achieving 40% GDP growth over five years.

Polish Telcos to Form 5G Joint Venture with Government

Three of Poland's major operators have agreed to develop 5G networks with two state-owned companies to speed up roll-out, according to a report from Reuters. Poland's state development fund PFR and state-owned operator Exatel signed a Memorandum of Understanding with Orange Polska, T-Mobile Polska and Polkomtel to set up a company to build national 5G infrastructure. The move comes after Exatel called for Poland to form a consortium of private and state companies to develop 5G network infrastructure in the 700MHz band in a bid to lower costs and improve security. "The goal of the joint venture is to ensure nationwide availability of services 5G in selected bands, technology security and low service prices thanks to synergies of common infrastructure," PFR CEO Pawel Borys said on Twitter. Play Communications, Poland's biggest operator by subscribers, didn't sign up due to pending corporate approvals, a spokesperson told Reuters.

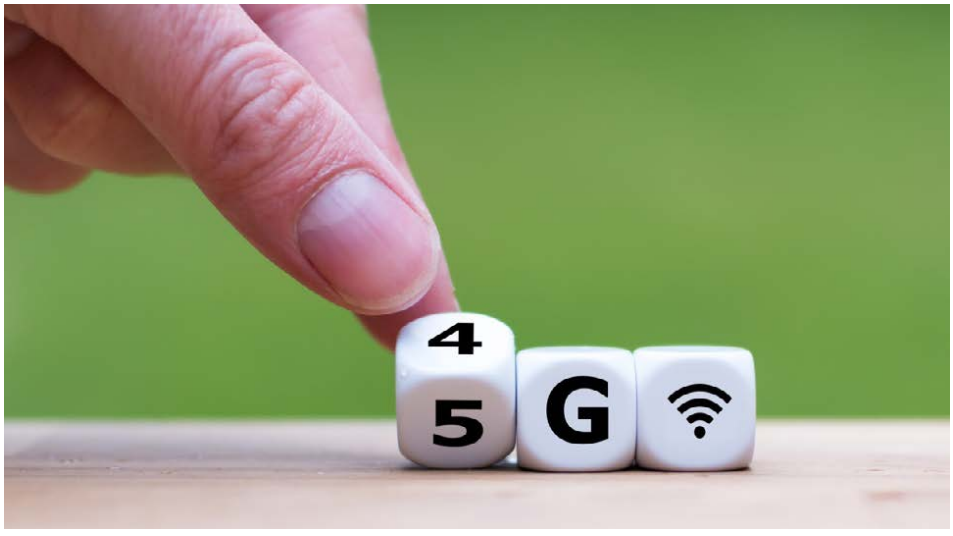
Polish Government, Operators Unite on 5G

Three of Poland's major operators signed an agreement to develop future 5G networks with two state-owned companies in a bid to accelerate deployment of the technology, Reuters reported. The memorandum of understanding was inked with Poland's state development fund PFR and state-owned operator Exatel, with the goal of establishing a company to build the country's 5G infrastructure. Although Orange Poland, T-Mobile Poland, and Polkomtel signed up, Play Communications, which GSMA Intelligence data shows is the country's biggest operator by subscribers, did not: a representative told Reuters it needs corporate approval for such a move. Exatel had advocated for the union of private and state-owned companies to develop and launch 5G networks in the 700MHz band, to accelerate delivery of key benefits including low-latency and faster download speeds. PFR CEO Pawel Borys said on Twitter: "The goal of the joint venture is to ensure nationwide availability of services 5G in selected bands, technology security and low service prices thanks to synergies of common infrastructure." In September, the US and Poland agreed to strengthen collaboration on 5G security, outlining guidelines for companies supplying gear used to build networks. This immediately drew assumptions the move was part of a US campaign to persuade other governments to follow its lead by banning the use of Huawei gear, following allegations the vendor is a national security threat. Huawei has long denied such claims. In July, the vendor outlined its commitment to the Polish market with plans to spend almost PLN3 billion ($778.5 million) in the country over the next five years.

Ofcom Updates Proposals for Spectrum Auction in 2020

The regulator's new plans bring the Shared Rural Network, proposed by the UK's mobile operators last week, a step closer. Ofcom says the released airwaves will help improve coverage, boost network capacity and support the rollout of 5G. The update is to the auction rules Ofcom proposed in December 2018, which would have given operators a discount at the auction in return for a commitment to increase coverage in rural areas. Since then the four mobile network operators – BT/EE, O2, Three and Vodafone – proposed an alternative plan to Ofcom and the government for a Shared Rural Network that would deliver good quality 4G coverage to at least 92% of the UK over six years. Last week the government announced it was in favor of their target, which they would fund jointly so long as the government committed up to £500 million in addition to offset the cost providing infrastructure to the hardest to reach places. The operators also insisted that Ofcom dropped its proposed 5G coverage obligations in return for discounted prices in the upcoming spectrum auction, which Ofcom has now agreed to do. It said in a statement, "This is because, through the companies working together, the agreement will achieve higher coverage than the requirements we could have set through an auction". Now the auction, to be held next year, will offer spectrum in two frequency bands:

- 80MHz of spectrum in the 700MHz band which are suitable for indoor and outdoor coverage across very wide areas, including rural ones. These airwaves will also boost the capacity of today's mobile networks.



- 120MHz of spectrum in 3.6-3.8GHz band, which "are part of the primary band for 5G and are capable of carrying lots of data-hungry connections in concentrated areas. All four of the biggest mobile companies have launched 5G this year, and releasing these airwaves will help increase the capacity and quality of mobile data services".

Ofcom plans to use a format known as 'simultaneous multiple round ascending' for the auction, as it did in the 2018 spectrum auction, which involves two stages:

- Principal stage in which companies first bid for airwaves in separate 'lots' to determine how much spectrum each company wins.
- Assignment stage, in which there is a round of bidding to determine the specific frequencies that winning bidders will be allocated.

Winners of 3.6-3.8GHz spectrum will have an opportunity within the assignment stage to negotiate their placements within the band among themselves. Ofcom claims this will make it more straightforward for bidders to join together the new spectrum they win with their existing holdings, and potentially reduce the level of 'fragmentation' in the wider 3.4-3.8GHz band. The regulator has asked for responses to the new proposals by 9 December, and plans to publish its final decisions in early 2020, before starting the auction in the spring.

Russian Government Supports Capping Foreign Ownership of IT Companies at Just Under 50%

The Russian government supports a draft law to limit foreign ownership of major national IT companies to 50 percent minus one share, according to a parliamentary website, Reuters reported. Initial proposals had seen ownership capped at 20 percent. Under the draft law, which if approved would go into effect from 1 January, companies not in compliance would not be allowed to promote themselves or others within Russia. The government letter, dated 18 October and published on the website for the legal acts disclosure, said the criteria of significant informational resources still has to be defined. The proposal has drawn critics from several sides, including from the companies themselves. Critics say Russian authorities are looking to tighten control of the internet, threatening to stifle individual and corporate freedom. But the Kremlin says it is trying to protect the integrity of the internet's domestic segment.

IMDA Singapore to Ensure Competitive Edge by Allowing Four 5G Networks

Singapore has set its sights on up to four 5G networks, instead of the two initially planned for, as it takes bolder steps to embrace a technology believed to be crucial to the nation's economic growth. All four networks can be rolled out by next year, although nationwide coverage will take much longer and be limited to only two networks due to the scarcity of 5G airwaves for islandwide reach. These scarce airwaves, that enable nationwide reach, will become available only in 2021, and wider coverage will start being rolled out in 2022. However, all four networks may offer localized coverage next year. The Infocomm Media Development Authority's (IMDA) more aggressive push to have two extra smaller 5G networks factors in immediate industrial needs - for example, in smart ports and smart factories to remotely operate cranes or vehicles to move shipping containers or goods round the clock. A public consultation completed in July elicited calls to involve all four telcos here - Singtel, StarHub, M1 and TPG Telecom - to spur innovation. The authority had originally planned to give out licenses to operate only two 5G networks with nationwide coverage built with the most advanced technologies that do not piggyback on existing 4G technologies. Announcing the decision, Minister for Communications and Information S. Iswaran said Singapore can accommodate two more localized 5G networks in addition to two nationwide ones to involve all four telcos here. "IMDA expects the greater competition to benefit consumers and businesses, and bring about greater choice, more competitive prices and service innovation," he said. "Singapore's 5G ecosystem will be the backbone of our digital economy." The IMDA's current position does not compromise Singapore's original intention to be among the front runners in the roll-out of next-frontier applications, possible only through a full-fledged 5G network. The technology promises surfing speeds 20 times faster than what 4G networks offer and the ability to connect 1,000 times as many devices. A full-fledged 5G network will also be able to support critical applications such as driverless car navigation and remote surgery that requires a constant connection without lag. Operators have been asked to submit detailed proposals by January next year, after which 5G airwaves will be assigned. Two networks will be earmarked for nationwide coverage. The proposals will be assessed on factors such as network security design and ability to achieve 50 per cent island wide coverage by end-2022. Operators of the nationwide 5G network need to each offer at least $55 million for the scarce 3.5GHz band of airwaves to provide nationwide coverage. Meanwhile, operators of the two smaller 5G networks will pay only an annual utilization fee and be given the millimeter wave (mmWave) spectrum. They are allowed to piggyback on existing 4G technologies initially as 5G technologies for mmWave deployments are not available yet. The race for 5G supremacy is linked to economic progress, and is at the center of an ongoing trade war between the United States and China. The US has also been trying to stop its allies from using 5G mobile systems supplied by Huawei, citing espionage concerns. It has said it will evaluate how to share intelligence with governments that have 5G networks using equipment from "untrusted vendors", referring to Huawei. Mr. Iswaran said that Singapore has not banned any vendors. He added: "We have emphasized the need for resilience and vendor diversity in our systems, and also that the systems meet our security requirements."

Estonia Opens New 5G Consultation

Estonia's Ministry of Economic Affairs and Communications (MKM) and the Consumer Protection and Technical Regulatory Authority (TTJA) have begun a consultation on the provision of the 700MHz (694MHz-790MHz) and 26GHz (24.25GHz-27.5GHz) bands for 5G mobile services. The regulators have not given a proposed schedule for when the spectrum will be made available to operators. The TTJA has previously consulted on the use of the 700MHz band in September 2016. Plans to auction three 3.5GHz licenses earlier this year were derailed due to a legal challenge concerning the terms of the sale and the number of concessions on offer.

Russia Completes Digital Broadcasting Transition

Russia has completed its switchover of national TV channels to digital terrestrial television (DTT), with the last-phase switch-off of federal analogue TV channels in 21 regions occurring on 14 October, completing a schedule begun in December 2018, reports Broadband TV News. DTT services cover 98.4% of the population. Note that Russian regional analogue TV broadcasters have been permitted to continue operating. TeleGeography says that Russia's national DTT broadcasting network, owned by Russian Television & Radio Broadcasting Network (RTRS), completed its network-wide upgrade from DVB-T to DVB-T2 in 2012-2015, and the all-DVB-T2 network reached its 98.4% federal footprint in 2018 (while the remaining 1.6% of the population can receive the current 20 'must-carry' national channels via satellite TV). DVB-T2 enables DTT transmission to occupy frequencies within the 470MHz-694MHz band, theoretically freeing up the 700MHz (694MHz-790MHz) band for mobile broadband services including 5G. However, around 20% of frequency assignments for digital TV channel packages (multiplexes) will reportedly remain in the 694MHz-790MHz range, and Russia's communications ministry is yet to confirm plans for 5G 700MHz licensing. Contrastingly, in the 800MHz band (791MHz-862MHz) Russian mobile operators were issued federal 4G licenses back in 2012.

India Eases Stance on Spectrum Fees

Indian authorities showed willingness to compromise on the price of spectrum ahead of the country's first auction in three years, addressing a major complaint of cash-strapped operators in the country, The Economic Times (ET) reported. Speaking at the India Mobile Congress, communications and IT minister Ravi Shankar explained the government is aware of operators' concerns that the cost of spectrum is too high, but noted a procedural review around fees and the amount to be sold is ongoing. He said an auction would take place by the close of the current financial year, which runs to end-March 2020, with precise details on the timing to be announced soon, ET reported. The auction will be India's first since October 2016 and was originally scheduled to take place by the end of the current calendar year. Government proposals could see up to 3,000MHz of spectrum offered across eight bands, two of which would be for 5G. In August, ET reported the review would likely cause the timeline to slip into early calendar 2020. Shankar's comments came as Bharti Enterprises vice-chairman Rakesh Bharti Mittal levelled further criticism on the government's pricing during the same industry event. LiveMint reported the executive also highlighted planning permission for new mobile sites as an ongoing issue, urging regional authorities to streamline the process for 5G services in particular. Operators are not alone in calling for India's government to take action over the high cost of spectrum: in August the Confederation of Indian Industry reportedly warned a high reserve price on 5G bands would put further pressure on operators' earnings and slow the overall growth of the sector. A fierce price war in India has strained operators' earnings potential since Reliance Jio entered the market in 2016, resulting in a wave of consolidation and exits. The Telecoms Regulatory Authority of India recently released figures showing ARPU had begun to rebound, growing 6.43 per cent year-on-year to INR74.30 ($1.04) at end-June.

Vietnam and Cameroon Officials Set to Meet to Resolve Nexttel Dispute

Vietnam's Deputy Prime Minister, Vuong Dinh Hue, is set to meet with the government of Cameroon next month to resolve a dispute between the shareholders of mobile operator Viettel Cameroon, which operates under the brand name Nexttel. Financial Afrik reports that the dispute involves the cellco's shareholders, Vietnamese military-owned Viettel Group (70%) and local company Bestinver Cameroon (Bestcam, 30%), which have disagreed on issues such as signatures for financial transactions, the recruitment of staff, engagement of foreign partners, the purchase of telecoms hardware, and technology transfers. In May this year the government launched an inquiry to investigate the dispute and has proposed a number of resolutions to end it, including reinstating Vietnamese employees at Nexttel.

Germany to Maintain Level Field for 5G Vendors

Germany was tipped to be on the brink of allowing Huawei to supply equipment for 5G networks in the country, ignoring calls from the US to ban the under-fire Chinese vendor, Reuters reported. A senior government source told the publication the country is set to publish a "security catalogue" this week, which had been finalized by the national network regulator and Cybersecurity watchdog. The rulebook will outline Germany's intentions to maintain a level playing field for vendors in building 5G networks, imposing no bans and thus allowing Huawei to work with operators in the country. "Germany's approach did not, and does not, foresee any clause that would exclude any one company," said the government official. The nation's decision does not come as a huge surprise. Despite pressure from Washington to ban the Chinese company, both Germany and the UK have indicated Huawei would play some part in the rollout of 5G. Last week, the European Commission also declined to single Huawei out following a risk assessment of 5G networks, although it did warn against state-backed threats to the technology, along with a heightened risk associated with infrastructure deals involving single suppliers. Europe's approach contrasts greatly from the US, which imposed export sanctions on Huawei in May, resulting in severe ramifications on its network and smartphone business. Reuters said Germany's network operators have opposed calls to ban the company, which the US alleges uses backdoors in its equipment for spying. Huawei is considered to be a leading vendor in 5G equipment and there were fears among domestic operators, which all work with the company, that a ban could delay the rollout of the technology by years and add billions to deployment costs. The security rulebook will, however, require Deutsche Telekom, Vodafone Germany and Telefonica Deutschland to identify and apply enhanced security standards to critical network elements, Handelsblatt reported. It will also require vendors to agree to pay damages to customers if proof is found that equipment has been used for spying.

Appeals Court Backs FCC Net Neutrality Position; Allows States to Introduce Own Rules

The DC Circuit Court of Appeals delivered a mixed ruling on Net Neutrality, allowing the December 2017 repeal by the Federal Communications Commission (FCC) to stand, but dismissing a provision blocking states from implementing their own open internet rules. Following the appeal – which had been argued by internet firm Mozilla Corporation on 1 February 2019 – the three-judge panel said that they had found the challengers' arguments to be largely unpersuasive. However, the judges delivered a blow to the FCC by ruling it had exceeded its legal authority by seeking to block states from passing their own Net Neutrality rules, as many did in a backlash to the FCC's repeal. According to TeleGeography's GlobalComms Database, the FCC plan to repeal Net Neutrality rules was approved in December 2017, following a 3-2 vote – split along Republican-Democrat party lines. As such, the FCC's 'Restoring Internet Freedom Order' took effect on 11 June 2018, scrapping the Title II rules and reverting internet services to their Title I 'information service' status. The June 2018 order removed mandates which previously prevented ISPs from blocking, throttling or otherwise prioritizing online content.

Mauritius Denies Rumors of UTL Interest

The government of Mauritius has played down rumors that local state-backed telco Mauritius Telecom (MT) is still interested in acquiring a majority stake in Uganda Telecom Ltd (UTL). The Ugandan government is looking to sell off around two-thirds of UTL in an attempt to revitalize the struggling operator, but a deal agreed a year ago with Nigeria-based investor Teleology fell through in January due to its failure to hand over the deposit payment. At the time of the Teleology deal, MT had been named as another potential buyer for UTL. According to a report from the Kampala Post, however, there are now no plans for MT to take a stake in its Ugandan counterpart. Officials in Mauritius have also denied that Uganda's Minister for Privatization and Investments, Evelyn Anite, travelled to Mauritius in August to discuss a possible deal between MT and UTL. According to TeleGeography's GlobalComms Database, MT is 33.5% state-owned, while Orange of France has a 40% interest.

Low-Income Countries See Drastic Fall in Mobile Data Costs: Study

The cost of mobile data for consumers in low and middle-income countries has fallen across all regions, new research from the Alliance for Affordable Internet (A4A1), an initiative of the Web Foundation finds. Low-income countries saw the most improvement, a historic reversal with progress of poorer countries previously lagging behind middle-income countries. The average cost for 1GB data as a percentage of average monthly income declined by 11 percent, from 5.8 percent of average monthly income in 2018 to 4.7 percent today. Still, among those countries covered in this survey, over 1 billion people live in a country where an entry level plan of 1GB of mobile data is not affordable. Across Africa, where internet data remains unaffordable for millions, particularly women, there was a particularly steep decline, with the cost of 1GB data dropping from 9 percent to 7.1 percent of average monthly income. This fall in cost brings internet access, a key driver of development and equal opportunity within reach of millions more people. The report however says the cost of broadband is prohibitively high: if the average US earner paid 7.1 percent of their income for access, 1GB data would cost USD 373 per month. The report says falling broadband prices drove affordability in certain African countries. In Sierra Leone, the relative cost of 1GB data tumbled from 25.9 percent to 9.9 percent after the introduction of a number of more affordable data plans by the largest operator. In Burkina Faso, reduced prices halved the cost of 1GB from 14.8 percent to 7.8 percent of monthly income. In countries such as Zimbabwe, a rise in incomes made broadband data more affordable, dropping relative cost from 19.8 percent to 10.1 percent of monthly income. It is important that these gains are not rolled back and indeed shape the trend towards increased affordable access. According to the study, declining costs meant seven new countries reached the international threshold of affordability for the first time in 2019, making internet affordable for most people, including those at below average income levels in Algeria, Bangladesh, Cabo Verde, Colombia, Ecuador, Namibia, and Paraguay. The United Nations '1 for 2' standard defines affordability as 1GB data for no more than 2 percent of average monthly income. Because high costs keep people offline, the countries and regions with the least affordable data are also those with the fewest people connected to the internet. In Africa, where data is the least affordable at 7.1 percent of average monthly income, only 24 percent of the population is online compared with 51 percent globally. The organization calls on governments to take urgent action to make internet access affordable for more people. By improving competition in telecommunications markets and investing in public access solutions in places like libraries, schools, and community centers, it says, governments can lower the cost to connect and in turn bring more people online.

Law to Give UK Operators Access to Buildings to Install Broadband

Uncooperative landlords have made it difficult for up to 9 million flat dwellers to have internet access. Operators reported that 40% of their requests for access receive no response from landlords, who they can take to court to resolve the issues, but this is expensive, uncertain and slow. The new legislation, announced by Digital Secretary Nicky Morgan, will be put into place as part of the UK government's response to the consultation Ensuring tenants' access to gigabit-capable connections. The law will amend the Electronic Communications Code to provide operators with a faster, cheaper route to gain interim rights under the existing, and much criticized, Electronic Communications Code via the Upper Tribunal (Lands Chamber) and its equivalent in devolved administrations. This route will apply only in circumstances where a tenant has requested a service, the landlord's permission is required for that service to be delivered, and the landlord fails to respond to repeated requests from an operator for access. The proposed legislation follows the government announcing £5 billion of new funding to bring gigabit-capable broadband to the hardest-to-reach parts of the UK at the Tory Party Conference. A statement about the new legislation read, "It is the latest Government action to bust the barriers to faster broadband rollout and enable the private sector to get the job done." The measures will make it easier to install faster internet connections in blocks of flats where landlords repeatedly ignore requests for access from broadband firms. It is estimated that an extra 3,000 residential buildings a year will be connected as a result. The UK has an estimated 480,000 blocks of flats (apartments). Steve McCaffery, SVP of Service Providers, International at CommScope remarked, "While further investment in broadband connectivity is always welcome, we should be considering how networks will converge in time to deliver superfast, reliable connectivity. "There are considerable network efficiencies to be gained from improving the interfaces between wired and wireless networks – and these efforts will also extend to the Internet of Things (IoT), as our smart homes get increasingly smarter. "There is little value in having an Amazon Alexa, for example that…isn't connected to other relevant intelligent 'things'. Network convergence will help enable this as more homes are increasingly connected."

USDA Targets 14 States with $152 Million in Rural Broadband Funding

The U.S. Department of Agriculture is investing $152 million in 19 rural broadband projects across 14 states. The USDA rural broadband funding projects are in Illinois, Indiana, Kentucky, Minnesota, Missouri, North Carolina, North Dakota, Oklahoma, Pennsylvania, Tennessee, Texas, Virginia, West Virginia and Wisconsin. "Deploying high-speed broadband internet connectivity, or 'e-Connectivity,' in rural America expands access to essential health, educational, social and business opportunities," Deputy Under Secretary for Rural Development Donald "DJ" LaVoy said in a press release. "President Trump and Agriculture Secretary Perdue are committed to fully utilizing all resources Congress provides for building and modernizing this critical infrastructure in rural America, because we believe that when rural America thrives, all of America thrives."

The press release offered examples of the projects:

Logan Telephone Cooperative Inc. will get a $34.4 million Telecommunications Program loan to upgrade a FTTH system in Butler, Logan and Muhlenberg counties in southwestern Kentucky.

In Morton County, N.D., USDA is partnering with BEK Communications Cooperative to provide an $844,000 Community Connect Program grant. The 49-mile Fiber-to-the-Home network will bring high-speed broadband to 125 underserved households.

In southwest Virginia, iGo Technology Inc. will get a $3 million Community Connect grant to bring enhanced broadband opportunities to 820 homes and businesses. The Bee Community Center, in the town of Bee in Dickenson County, will get free broadband for two years.

These rural broadband investments flow from a few USDA rural development programs, including the Community Connect Grant Program, the Telecommunications Infrastructure Loan Program and the Rural Broadband Access Loan and Loan Guarantee Program. Additional rural broadband funding from a different USDA program, the ReConnect Pilot Program, should be announced soon. That program will allocate $600 million for rural broadband projects. USDA has received 53 applications from rural areas across 33 states, representing 1,099 farms and 859 businesses.

EU Lays Out 3 Primary Security Concerns Related to 5G

The European Union member states published a report assessing the security risks of 5G networks. Predictably, given the focus on Chinese telecom vendors this year, the report looks at supply chains, and warns against using suppliers that can be controlled by governments. The report also cautions carriers to not rely on a single vendor. In addition, it also raises awareness of some risks that haven't been discussed widely – namely, the role of increased software in networks. Led by concerns raised by the United States government, EU countries are also evaluating the use of Huawei's telecom equipment in their networks. The concern is that Huawei would have to comply with the Chinese government if it was asked to use its telecom equipment for espionage. The EU report said, "Threats posed by states or state-backed actors are perceived to be of highest relevance. They represent indeed the most serious as well as the most likely threat actors, as they can have the motivation, intent and most importantly the capability to conduct persistent and sophisticated attacks on the security of 5G networks." The report also said that a carrier's big reliance on a single supplier puts it in a bad spot if that sole supplier has problems whether due to commercial failure, being subject to a merger or acquisition, or being placed under sanctions. Also, reliance on a single vendor could increase the impact of any systemic failures or hostile exploitation. Roger Entner, founder and lead analyst of Recon Analytics, said in an email, "Europe is finally understanding how single vendor systems pose grave threats to 5G security. Single vendor deployments are exposing operators to incalculable risks as operators tie their success to the viability of their vendors. Furthermore, it becomes necessary to trust in the vendors to an even greater degree, as some are

vulnerable to state actors and sponsors, including those who don't share our democratic principles. The next step is to translate the concerns the European Commission has into binding rules that prevent 5G networks from becoming controlled by criminal and state actors alike." Everyone has been focusing on the potential security threats posed by the Chinese vendors Huawei and ZTE. But the EU report points out that 5G networks are fundamentally different than prior generations in that they will rely much more on software. And this introduces new security risks. More software in 5G networks leads to increased risks connected with software development and update and patch processes. Moreover, new types of technical vulnerabilities related to software are likely to occur as technologies such as SDN and NFV are deployed commercially.

Ofcom Publishes Updated Proposals for 700MHz/3.6GHz-3.8GHz Auction

Following reports that the UK's mobile network operators (MNOs) have submitted binding voluntary commitments to improve 4G coverage through a 'Shared Rural Network', local regulator Ofcom has published updated proposals for the auction of frequencies in the 700MHz and 3.6GHz-3.8GHz bands. In December 2018 Ofcom launched a consultation on auction proposals that included the opportunity for up to two bidders to receive a discount on the cost of the spectrum in return for accepting obligations to improve mobile coverage. Now, as a result of the aforementioned network sharing project announced last week by the MNOs, the regulator has said that it is consulting on revised auction plans which have no coverage obligations, which it suggests 'reflect this material change in the relevant circumstances' and could 'deliver better coverage outcomes for consumers than could have been delivered by [its] proposals'. As per the auction plans, Ofcom has confirmed that it aims to offer 200MHz of spectrum across the two bands, comprising: 80MHz in the 700MHz band, which it expects to become available for mobile use nationwide by May/June 2020; and 120MHz in the 3.6GHz-3.8GHz band, which should become available for mobile use across the country by June 2020, although some 'localized constraints may remain in place until the end of 2022'. Meanwhile, as a result of its decision to scrap coverage obligations, the regulator is now proposing to run the auction using a Simultaneous Multiple Round Ascending (SMRA) format, which comprises a principal stage (where companies will bid for spectrum in separate 'lots' to determine how much each bidder wins), followed by an assignment stage to determine the specific frequencies winning bidders will be allocated. Ofcom has invited responses to its consultation by 9 December 2019, ahead of making a final decision, and it has said it hopes to be in a position to start the spectrum auction by spring 2020. Finally, Ofcom has also confirmed that, to ensure that MNOs stick to the commitments they have now made for improving coverage, it will write conditions into their respective spectrum licenses, with these to be published 'in due course'. Further, the regulator has said it will set out the criteria and methodology for assessing and, as necessary, enforcing compliance with these commitments.

BTRC Seeks Ministry Nod for Telcos Single Licensing System

The Bangladesh Telecommunication Regulatory Commission (BTRC) last week sought the approval from the Posts and Telecommunication Ministry The telecom regulator has sought government approval to scrap the current multiple licensing regime for mobile operators, and introduce single licensing system to reduce operational complexity. The Bangladesh Telecommunication Regulatory Commission (BTRC) last week sought the approval from the Posts and Telecommunication Ministry. "We have already sought ministry approval for single licensing system for mobile operators," BTRC Chairman Jahirul Haque told Dhaka Tribune. He said introduction of single licensing system would reduce hassle for all related parties. BTRC officials have said that currently a mobile phone operator has to maintain one generic license for operating as a mobile phone entity, two licenses for running 2G services, two for 3G services and two other licenses for rendering 4G services. The single licensing will come into effect from the date of license issuance and remain valid till February 18, 2033, subject to the renewal of spectrum, says the draft guideline. Under the proposed licensing guidelines, mobile phone operators will be allowed to provide nine types of services including 2G, 3G, and 4G cellular mobile phone services. Besides, intra-operator domestic voice and video calls, inter-operator domestic voice and video calls, international long-distance voice and video calls, international roaming services, SMS/EMS/VMS/MMS, mobile internet, value-added services (VAS) as per TVAS guidelines and any other compatible services as approved by the commission will also be allowed under the planned system. Annual license fee for the single license in the draft guidelines has been proposed at Tk10 crore along with 5.5% revenue sharing and 1% contribution to social obligation fund. The Association of Mobile Telecom Operators Bangladesh welcomed the BTRC's move. "We welcome BTRC's initiative of combining the licensing guidelines and have submitted our observations earlier to the regulator. But, we are not sure which points are taken and which are not," said Brig Gen SM Farhad (Retd), secretary general of AMTOB. In June last year, BTRC initiated the move for unified licensing for the mobile phone companies and prepared the draft guideline in August this year.

Bangladesh Telcos Pay 3rd Highest Spectrum Fee in South and Southeast Asia

Among South and Southeast Asian countries, Bangladesh's mobile phone operators have been paying the third highest spectrum charge in last 10 years, said a sector in-depth report of global rating agency Moody's Investment Service. In Bangladesh, telecom operators have paid 7 per cent of their aggregated revenue for spectrum charge. Indian mobile phone operators have paid the highest (7.6 per cent) of their aggregated revenue as spectrum charge. The second highest spectrum charge was paid by the telecom operators in Thailand — 7.3 per cent of their revenue. However, the spectrum payment terms are operator-friendly, said the Moody's report, adding that the telecommunication companies in Thailand, India and Bangladesh pay between 25 per cent and 50 per cent of the total amount upfront, with the option to pay the rest over three to 10 years. In the three countries, the governments also typically allow a moratorium period before the annual spectrum payment instalments kick in, the report said. In exceptional circumstances, governments could provide more payment buffers, the report said, adding, 'For instance, in August 2019, the Indian government termed out the spectrum payments to 16 years from the earlier agreed 10 years after considering the constraints on the Indian telecom companies following a period of unprecedented intense competition.' On the other hand, telecom operators in Singapore, Malaysia and Indonesia make spectrum payments upfront, with small annual licensing fees. As percentage of revenue, spectrum payments in Singapore and Malaysia were lower than in the other five countries covered in the analysis. Moody's analyzed financial data from 2009 to 2018 of 20 telcos in seven South and Southeast Asian countries — the leading three telcos by subscribers in Bangladesh, India, Indonesia, Malaysia, Singapore and Thailand, and the leading two telcos by subscribers in Pakistan. The report also revealed that the country where telecom operators made high spectrum charge, usually paid lower dividend to their shareholders. In the countries, the shareholders other than the government received $52 billion as dividend during the period. On the other hand, the government received $37 billion as spectrum charge, $24 billion as taxes and another $28 billion as dividend from the South Asian telecom operators. 'The high prices that telcos in this region pay during spectrum auctions regularly make headlines, but the recurring dividends that they do pay to governments tend to get less attention,' said Nidhi Dhruv, Moody's vice-president and senior analyst. 'Yet, our analysis finds that in some countries dividends account for a greater share of revenue,' it said. While spectrum payments in government-run auctions were higher in absolute terms, on a relative basis dividends account for a larger percentage of aggregate revenue for telcos in several countries, he said. 'Government-owned incumbent telcos in Singapore, Malaysia and Indonesia pay the highest dividends to their respective governments, while privately owned telcos in India, Thailand and Bangladesh pay more in spectrum auctions,' said Dhruv. About the regulatory framework, the Mood's report said that the regulations in Thailand, India, Bangladesh and Pakistan were less predictable and often politicized. Government-owned telcos pay high dividends but also benefit from regulatory support, it said.

Portuguese Competition Authority Approves MASMOVIL Takeover of Nowo, ONI

The Portuguese Competition Authority (Autoridade da Concorrencia, AdC) has approved a request by Spanish alternative telecoms operator Grupo MASMOVIL to acquire Cabonitel, the holding company which controls Portuguese operators Nowo and Onitelecom (ONI). MASMOVIL's application received the green light from the watchdog on 15 October, just two months after the deal was submitted to the regulator – in August this year. The deal is being carried out by MASMOVIL IBERCOM and GAEA INVERSION (a company specifically incorporated for the realization of the transaction). Cabonitel owns 100% of the share capital of Nowo, which in turn holds the entire share capital of ONI. These companies are owned by Cabolink, a Luxembourgish company owned by funds managed by US private equity firm KKR. TeleGeography notes that KKR is understood to have acquired the business in 4Q18 after converting the debt it was owed into a controlling stake and had no long-term ambitions within the

Portuguese telecoms sector. Previously, back in September 2015 Altice agreed to sell Cabovisao (now Nowo) and ONI to Apax France for EUR140.6 million (USD161.6 million). The deal, which was part of the EC mandate relating to Altice's takeover of PT Portugal (MEO), closed in January 2016.

mmWave 5G Auction Could Happen in December, Reckons Ministry Official

Russia's State Commission for Radio Frequencies (SCRF) might hold an auction in December this year for 5G millimeter wave (mmWave) frequencies in the 25.25GHz-27.5GHz range, reports Vedomosti quoting Andrei Kantsurov, Director of the Department of State Communication Policy at the Ministry of Digital Development, Communications & Mass Media, who was attending the GSMA Mobile 360 Eurasia conference in Moscow this week. Mr. Kantsurov mentioned the availability of six frequency lots: four federal licenses with 400MHz bandwidth each and two regional concessions (of 250MHz and 400MHz bandwidth). Previously, a report by newspaper Izvestia citing a ministerial source and other officials claimed that eleven mmWave frequency lots were earmarked for sale, with a slightly later auction target of Q1 2020.

A SNAPSHOT OF REGULATORY ACTIVITIES IN SAMENA REGION

Bahrain

The Kingdom's National Broadband Network (BNET) was officially launched at a high level press conference held at the Capital Club. The launch was announced by Batelco Chairman, Shaikh Abdulla bin Khalifa Al Khalifa, in the presence of the Minister of Transportation and Telecommunications, Kamal Ahmed, BNET CEO Mohamed Bubashait, CEO's of OLO's (Other Licensed Operators) and members of Bahrain's media. During the event, the BNET logo, which will soon be rolled out to all customer touch points, was revealed. The launch event follows on from the announcement of Batelco's legal separation into two independent entities, which was announced at an earlier press conference held in May. As part of the legal separation, a new executive structure was implemented and new CEOs were appointed for both Batelco and BNET. Independent buildings and departments were also allocated for each entity, in line with the nature of the companies' work. In line with the requirements of the 4th National Telecommunications Plan approved by the Council of Ministers in May 2016, BNET will provide broadband network services to all licensed operators including Batelco, whereas, Batelco will focus solely on retail and corporate operations. Mr. Ahmed expressed his pleasure at the launch event by saying, "I would like to thank the team involved in the implementation of this successful project, which contributed towards turning the vision of the National Telecommunications plan into a reality, and is being witnessed today during this event. This project is a major leap for the services provided by telecommunications companies, where all customers will be able to benefit from high-speed Internet services from all telecom providers." During the event, Mr. Mohamed Bubashait, CEO of BNET gave a detailed presentation about the company's vision and functions as well as its strategy for managing the national network's infrastructure. The presentation also included a detailed explanation of the operational model and work mechanism that the company will follow to achieve its objectives. Also revealed was BNET's new logo, designed to symbolize both the national network and the Kingdom while being distinguishable from Batelco. Shaikh Abdulla stated that he was very pleased to announce the launch of BNET which is a key part of the Fourth National Telecommunication Plan (NTP4) to develop the growth and economic diversification of the telecommunication sector, including rolling out a fiber optic network to 100 per cent of all businesses and 95pc of all households across the Kingdom. "The restructure of Batelco is now complete with independent management teams and human resources in place. BNET's teams are now working on the implementation of its strategic plans which focus on the development of the fiber optic network across Bahrain and the provision of high-speed Internet services for OLO's on a fair and competitive basis. "The company will continue to complete the separation process as required in line with the Government's strategy and future vision for the telecommunications sector." "This step is part of a series of initiatives aimed to enhance Bahrain's position as a strategic investment destination, a regional ICT hub and a major contributor to upgrading the Kingdom's telecommunications services," he concluded. (October 19, 2019) newsofbahrain.com

The Telecommunications Regulatory Authority (TRA) of the Kingdom of Bahrain has recently published its latest Telecommunications Services Residential Market Survey report. According to the results of the survey, Internet users have reached 99% which is a clear indication of the increasing affordability of Internet services in Bahrain. The Kingdom leads the global ranking of the percentage of Internet users, according to data released by the International Telecommunication Union. The results of the survey show that Internet applications represent most internet activities such as social media applications. For instance, 99% of respondents said they use WhatsApp and YouTube, 95% use Instagram and Facebook and 90% use Snapchat. With regard to mobile telephony services, almost all respondents have a mobile phone service. However, the survey shows that the percentage of users having two or more mobile SIM cards is in decline, reaching 16% in 2018 compared to 38% in 2017. This reflects the developments in mobile telephony packages such as the introduction of new and comprehensive packages as well as the significantly increasing use of mobile data. The survey also indicates that the main reason put forward by respondents for having more than one SIM card was to have separate SIMs for business and personal use. As for the fixed line service, the results of the survey showed that 16% of the households surveyed have a fixed telephone line due to the high dependence on mobile phone services. Regarding telecommunications services users' satisfaction, the survey results showed that 85% of respondents expressed their satisfaction with telecommunications services in Bahrain. Moreover, users' proposals were focused on lowering prices and increasing the quality of services. "The results of this survey show significant developments in the nature by which telecommunications services are used and required by users." Says Acting General Director Sh. Nasser bin Mohammed Al Khalifa. "The high number of Internet users in Bahrain and the volume of internet usage that require high speeds and large amounts of data, in addition to the desire of users to obtain services at

lower prices and better quality, all illustrate the importance of the deployment of the National Broadband Network using fiber-optic cables, which was achieved through the Batelco's separation process. The network will enable the provision of high-speed broadband services to individual and business users." Sh. Nasser added. The survey included a sample of 1548 individuals in the age group of 15 years and above, who were surveyed on the availability and use of various telecommunication services as well as their satisfaction with telecommunication and online services. (October 9, 2019) tra.gov.ae

The Telecommunications Regulatory Authority (TRA) has participated in the 17th annual meeting of Arab Regulatory Network (AREGNET) which was held during the period from 24 – 26 September 2019 in Tunisia. TRA Bahrain delegation was headed by Shaikh Nasser Bin Mohamed Al Khalifa, Acting General Director of TRA, who gave a welcome note indicating the major achievements of AREGENET during the chairmanship of TRA Bahrain. Shaikh Nasser also added that "We live in a world of rapidly changing technology, particularly in telecom. How we communicate has made leaps and bounds since the days where all we had were voice calls. This means we have opportunities that are exploitable industry-wide. We can now look forward to advancements in technology like Artificial Intelligence, Internet of Things, Digital Currencies and 5G mobile networks which are all important topics of focus for all of us in light of major technological changes occurring around us". On the last day of the meeting, the general assembly meeting was held during which TRA Bahrain as chair of the current round handed over the chairmanship to the National Regulatory Authority for Telecommunications of Tunisia. The meeting was attended by representatives from Arab Regulators who presented the projects related to the sector. TRA Bahrain also chaired the expert group meeting, during which regulators from all the Arab region came together to discuss and review the updates of various joint projects and working groups. TRA Bahrain hosted a series of workshops and meetings as part of its activities in AREGNET during April 2019. The outcome of the working group meetings was presented and very welcomed by AREGENET members. The meeting also shed light on new projects which will be addressed during the coming round including topics like the economic effects of over-the-top (OTT) application, emergency communications in the Arab region, utilization of Artificial Intelligence (AI) in the telecommunications and ICT sectors and the new generation of mobile network (5G). (October 8, 2019) tra.gov.ae

The Telecommunications Regulatory Authority's (TRA) Board of Directors held their third meeting of 2019. At the beginning of the meeting, the Board expressed their sincere regrets for the demise of the Board Chairman Dr. Mohamed Al Amer, praising his long term serving the Telecoms industry and his effective contribution and prompt response as a Chairman in improving TRA's operations and services to further develop the telecommunications sector in the Kingdom of Bahrain. In the ten years under his guidance since 2008, TRA made significant strides towards the execution of the Government's policy to maintain the Kingdom's position among developing countries, helping shape the nation as a regional and international exemplar in ICT, which will continue to enable the Kingdom's economy as one capable of continuously adapting to change and ready to tackle future challenges. The Board also noted his many achievements and contributions across multiple sectors, commending his lifelong dedication to public service. During the meeting, Board members discussed key issues related to the telecommunications sector in; praising the Executive Management's outstanding efforts in the development and growth of the telecommunications sector in the Kingdom of Bahrain, in particular, TRA's significant efforts in accomplishing the Batelco Separation project and delivering the project in an efficient manner meeting the target set by the Government of three years. The Board also praised the Executive Management for their efforts in working towards enabling the launch of 5G networks through securing the necessary spectrum and adequate frequency licenses to keep pace with the latest developments in telecommunications technologies and services for the benefit of consumers in Bahrain. This makes it among the first countries in the region to launch a 5G network, promoting its leading position as an exemplar in 5G deployment. The Board also expressed their appreciation to the Executive Management for their endeavors towards protecting consumers in the telecommunications section by implementing and improving its regulations and enhancing its consumer-related systems to maintain effective communication between TRA, consumers and the telecommunications service providers. The Board also commended the Executive Management on promoting their performance to the highest levels of excellence and innovation and stressed on continuing to work in a transparent manner in dealing with all the sector-related issues, as well as on its position as an exemplar regulator in all its initiatives and strategies at a regional and international level through constructive cooperation with the international organizations. The Board of Directors expressed their thanks and appreciation to the TRA team members for their support and professionalism and outstanding role in developing the sector. This came as a result of the hard work and persistence of the highly professional team members that this was made possible. (October 1, 2019) tra.org.bh

Bangladesh

Bangladesh Telecommunication Regulatory Commission (BTRC) officially disclosed its primary decision of making 5G internet service available in the country by 2021. BTRC gave licenses to the mobile operators with a condition that they will have to bring all the district headquarters under 5G service by 2023 while the entire country by 2026. The commission revealed the information

during a program titled "Seminar on 5G in Bangladesh" held at Institution of Engineers, Bangladesh (IEB) at Dhaka's Ramna. Posts and Telecommunication Minister Mustafa Jabbar, who was present at the program, said 5G and fourth industrial revolution are interrelated. "5G is not only related with telecom services, it will also help boost digitization and automation in every sector." A committee formed by BTRC is already working to make a guideline on 5G which will be available from the first quarter of next year, the Minister added. BTRC Chairman Md. Jahurul Haque also spoke during the program. The government introduced 4G services in 2018 and 3G in 2013. (October 16, 2019) thedailystar.net

The Bangladeshi government is reportedly considering waiving GrameenPhone (GP) and Robi's late fees, which amount to nearly a half of the BDT134.5 billion (USD1.56 billion) claimed by the Bangladesh Telecommunication Regulatory Commission (BTRC) as unpaid dues in its 2019 audit. According to the country's legislation, a 15% compound rate is applied on late fees; of the BDT125.8 billion owed by GP, BDT61.9 billion is late fees, while Robi's BDT8.7 billion dues comprise BDT1.7 billion of late fees. BTRC Chairman Md Jahurul Haque was quoted as saying: 'The government might be considering giving a waiver on late fees for a swift resolution … We still stand by the audit findings, but the government has the final say.' The impasse between the regulator and the two cellcos – which vehemently dispute the audit claims – prompted Bangladeshi Finance Minister Mustafa Kamal to step in as a mediator last month; the official said at the time: 'If we continue with our claims, a resolution will take a long time and that will hamper the mobile operators' business and restrict our revenue growth too.' Due to the impasse with the BTRC, the two operators are currently banned from getting approvals for new services and packages and cannot import equipment to maintain their networks. In July 2019 the BTRC slashed GP's bandwidth by 30% and Robi's by 15% for the non-payment of the dues, but the block was lifted by mid-July as it was causing issues to subscribers. Further, the BTRC threatened GP and Robi with cancellations of their 2G/3G concessions if the requested sums were not settled, prompting GP and Robi to file cases with a Dhaka court, seeking permanent injunctions against the telecom regulator's audit claims. (October 3, 2019) The Daily Star

Egypt

The Ministry of Communication and Information Technology said in a report that the number of mobile subscribers increased to 94 million, while the number of mobile internet subscribers reached 38.79 million in June 2019 compared to 38.60 million in May 2019 and 34.27 million in June 2018. The ministry added that the number of ADSL subscribers declined to 6.88 million in June 2019 compared to 6.91 subscribers in May 2019. The number of ADSL subscribers was 5.82 million in June 2018. The number of landline subscribers declined to 8.21 million in June 2019, compared to 7.40 million in June 2018, with the ministry clarifying that the number of governmental landline subscribers is estimated at three percent, commercial landlines at 12 percent, and home landlines at 85 percent. The number of telecommunications and information technology companies reached 456 from January until March, compared to 357 companies during the same period in 2018. In 2015, the number of mobile subscribers increased by 214.37 percent from 30.3 million at the end of 2007 to 94.59 million in October 2014, driven by the growth of low cost pre-paid subscriptions. The number of Internet subscribers rose by 375.75 percent in October of 2014 to 46.96 million from 9.87 million at the end of 2007.

(October 14, 2019) egyptindependent.co

Iran

The expansion of communication services and promotion of telecom infrastructure investment have been high on President Hassan Rouhani's agenda since he took office for the first time in 2013. Data released by the Communications Regulatory Authority of Iran show that the sector has observed significant growth over the past few years. Internet penetration rate has reached 90.78% in the country. The mobile internet penetration rate is lower and stands at 78.14%. About two years ago, the rates stood at 53.53% and 41.72% respectively. Iran has over 64 million mobile internet subscribers, in addition to the registration of 10.3 million landline internet subscriptions.

(October 7, 2019) financialtribune.com

Jordan

The Ministry of Digital Economy and Entrepreneurship in cooperation with the Jordan Central Bank are working towards a new digital payment system. By the beginning of 2020, government payments to citizens, including National Aid Fund payments and bread subsidies, will be made through bank accounts or digital wallets to save time, according to a ministry statement. To prevent minor violations and corruption, direct cash payments to the government institutions will be no longer accepted in the upcoming year, the statement added. The ministry affirmed that no additional charges will be imposed on electronic payments and collection of revenues. (October 26, 2019) jordantimes.com

A workshop on "Regulating the Fifth Generation of Mobile Telecommunications" was launched by the Telecommunications Regulatory Authority (TRA) in cooperation with Nokia. Dr. Ghazi Al-Jabbour praised the efforts of Nokia in holding this workshop, and stressed the importance of informing the staff of the Commission on the latest developments in the field of 5G services and the possibility of using them and apply them at the local level, especially as the Authority has already begun to prepare for the provision of these services in the future. By allowing mobile operators to conduct technical experiments to operate 5G networks. The workshop dealt with a number of topics, including the role of the latest developments in the field of 5G globally and regionally, 5G technologies, managing the use of the spectrum resources needed to provide these services, in addition to the financial implications of the 5G. It is worth mentioning that the TRA is working on a series of workshops in cooperation with the companies providing systems for telecommunications networks globally to inform the TRA staff on the latest developments in this area. (October 23, 2019) trc.gov.jo

An agreement was signed to renew the public telecommunications license for Reuters Ltd. The agreement was signed by Chairman of the Board of Commissioners Dr. Ghazi Al-Jabbour and the representative of the company in Jordan, Walid Mustafa Al-Bayari in the presence of a number of Board members in accordance with the provisions of Article 12 / a / 4 of the Telecommunications Law No. (13) of 1995 and its amendments, and the provisions of the instructions for the renewal of public telecommunications licenses. The license and operating license have been signed for fifteen years from the date of expiry, enabling the company to continue to provide its media services in the Kingdom. Dr. Jabour pointed out that the TRA is always seeking to provide the necessary facilities for companies operating in the Jordanian market to promote the telecommunications sector in the Kingdom and to ensure the protection of the rights of all parties concerned, in addition to enabling licensed companies to provide a wide range of diverse communications services to citizens, which contributes to attract Investments to the telecommunications sector and the development of other sectors that rely on advanced telecommunications services, including the media sector, where Reuters has been granted a number of frequency licenses for fixed-satellite earth stations VSAT subscribers that seek Through which to provide information services associated with telecommunications services.

(October 20, 2019) trc.gov.jo

Sector watchdog the Telecommunication Regulatory Commission (TRC) has granted an operating license to Jordan Advanced Fiber Optic Company, a 51/49 joint venture of utility firm Jorden Electric Power Company (JEPCO) and Umniah, the Jordanian arm of Bahrain Telecommunications Company (Batelco). TRC Chairman Dr. Ghazi Al-Jabour noted that the company would install a fiber network in areas served by JEPCO with a view to providing wholesale broadband services as well as linking components of the company's energy network. As previously reported by TeleGeography's CommsUpdate, the joint venture aims to roll out fiber infrastructure to connect around 1.4 million homes and business in Amman. (October 8, 2019) telegeography.com

Kuwait

The Communication and Information Technology Regulatory Authority (CITRA) has announced the launch of the Kuwait Internet Exchange (IXP) project: a carrier neutral Internet exchange point operated by CITRA, interconnecting local networks and content providers to lower costs and enhance end-user experience. It serves as a central connection point for content providers, cloud providers, and networks to enable exchange of information locally rather than overseas. ix.kw is the first open, carrier neutral, and community-directed Internet Exchange Point in the region. The end user MoU is available on the website and it lists connectivity terms and conditions. The website details membership options, current members and provides users with a snapshot of ix.kw utilization. Mr. Fahad Al Fahad, Chief of the Telecommunications Sector at CITRA, stated that creating a regional peering hub will improve reach, assure quality, and lower bandwidth costs in order to deliver enhanced user experience to the region using a robust state of the art infrastructure to position ix.kw as a leading regional internet exchange point. Al Fahad also stated that the launch of the IXP project is a step forward in the digital transformation plan outlined in the Kuwait 2035 vision.

(October 20, 2019) citra.gov.kw

Kuwait and Estonia inked a Memorandum of Understanding (MoU) on bolstering cooperation on cyber security and digital transformation within the framework of the exerted efforts aiming to materialize Kuwait's vision in this matter. The MoU was signed by Chairman and CEO of Communications and Information Technology Regulatory Authority Salim Al-Ozainah and Executive Director of Estonia's Communication and Information Technology Siim Sikkut in the Estonian capital, Tallinn. Speaking to KUNA in a statement, Al-Ozainah expressed delight for inking this MoU, which comes in culmination of the efforts and negotiations conducted between the concerned bodied of the two countries. He stressed the importance of the memo in materializing Kuwait's vision on digital transformation to turn the country into a financial hub by 2035. It will also contribute to developing cooperation in digital governance, cyber security, digital transformation and other relevant domains, he noted. In addition, the memo will help share information on cyber security, learning, joint training, combating cybercrimes, building capabilities and others, he stated. Meanwhile, Sikkut said the memo would contribute to sharing expertise and developing human resources, which run innovative government services.

(October 20, 2019) citra.gov.kw

Nepal

The Nepalese government has awarded Nepal Telecom (NT) a NPR3 billion (USD26 million) contract to lay fiber-optic cabling in the western provinces of Karnali Pradesh and Sudurpashchim Pradesh. The announcement follows the recent decision by Nepal's telecoms regulator, the Nepal Telecommunications Authority (NTA), to terminate the contract originally awarded to Smart Telecom in September 2017, after a review of the project found the company had installed less than 1% of the planned 2,500km fiber-optic cable infrastructure along the Mid-Hill Highway. (October 29, 2019) Nepalitelecom.com

Nepal's government-led project to lay fiber-optic cabling along the Mid-Hill Highway has failed to make any real progress despite being initiated more than three years ago, noting Nepal Telecom (NT), Smart Telecom and United Telecom (UTL) have all missed project deadlines. Nepal's telecoms regulator, the Nepal Telecommunications Authority (NTA), has now taken the step of cancelling Smart Telecom's contract to lay 2,500km of fiber-optic cable in Provinces 6 and 7, awarded in September 2017, as the company had only installed 20km of cabling. The NTA previously cancelled a contract awarded to UTL in April 2017 after the company failed to initiate work on the project in Gandaki Province and Province 5, while NT has only recently begun work in Provinces 1, 2 and 3 following a series of delays.

(October 22, 2019) The Himalayan Times

Oman

The Ministry of Technology and Communication in Oman together with Oman Broadband and Ooredoo has launched the high-speed Oman Government Network (OGN) in Muscat. This is an integrated and safe government network that meets the future demands of e.oman projects, like the G-Cloud, the official Oman eGovernment services portal, the National Data Center and other e.oman infrastructure projects. Dhafir bin Saif Al-Kalbani, Director General of Infrastructure, speaking on behalf of the Ministry of Technology and Communication, said: "The high-speed Oman Government Network replaced the current OGN in 63 government entities in Muscat including all ministry headquarters and some of their main branches in the capital. "They were linked using fiber optics network in a way that helps these entities in benefiting from the new network to provide their eServices with a better quality and a speed that reaches 1 GB in all government sites. "Moreover, the new network will play a role in upgrading the capacity of the OGN's ISDN lines and elevating its quality while decreasing the previous costs. Our hope for this network is for it to have a vital role in supporting a quicker Digital Transformation process in Oman and serving all important sectors like health, education, manufacturing, tourism, economy, and other sectors through providing high-quality eServices." (October 23, 2019) intelligentcio.com

The Telecommunications Regulatory Authority (TRA) has announced more details of its 5G roadmap as per the country's Vision 2040 strategy plan. On 15 October 2019 the industry regulator revealed that domestic operators Omantel and Ooredoo have been granted rights to use a 100MHz block of 5G spectrum to introduce a range of advanced and innovative services in the coming years. The TRA's statement read: 'The authority began early preparations to enable companies to provide 5G services and exempt companies from annual frequency usage fees for one year to encourage investment in the sector,' adding that 'In the next five years, 4,400 [base] stations will be constructed by Omantel and Ooredoo and they will conduct workshops to inform relevant government agencies of the applications in preparation for their readiness to use it.' It is understood that 1,000 new BTS will be deployed in 2019-2020 which TRA says displays the Sultanate's readiness for fifth-generation mobile services to enable cellcos to 'employ artificial intelligence in data analysis

and decision making, providing vital impetus to the overall economic development'. (October 21, 2019) telegeography.com

Oman telecom companies will now be able to provide 5G spectrum services. The Telecommunication Regulatory Authority (TRA) announced the details of Oman's 5G roadmap which will contribute to the development of many sectors such as education, health, logistics and others. TRA officials said, "The authority began early preparations to enable companies to provide 5G services and exempt companies from annual frequency usage fees for one year to encourage investment in the sector." "In the next five years, 4400 stations will be constructed by Omantel and Ooredoo and they will conduct workshops to inform relevant government agencies of the applications in preparation for their readiness to use it."

(October 16, 2019) timesofoman.com

Pakistan

The Telecom Regulator Pakistan Telecommunication Authority (PTA) has floated two consultation papers at their website namely: Consultation on Identification of Relevant Markets and Significant Market Power Operators (SMP) and Consultation on Unsolicited/ Spam Messages/ Calls. The closing dates are November 10, 2019 and November 25, 2019 respectively.

(October 24, 2019) brecorder.com

The number of 3G and 4G users in Pakistan reached 72.12 million by end-September compared to 71.35 million by end-August 2019, said Pakistan Telecommunication Authority (PTA). The number of mobile phone users in Pakistan reached 161.84 million by end-September compared to 161.79 million by end-August, which registered an increase of 0.05 million during the period under review. Jazz's total count for 3G users stood at 12.504 million by end-September compared to 12.769 million by end-August, registering a decrease of 0.265 million. Jazz 4G user numbers jumped from 12.457 million by end-August to 13.008 million by end-September. Zong 3G subscribers decreased from 8.133 million by end-August to 7.965 million by end-September while the number of 4G users jumped from 13.385 million by end-August to 13.787 million by end-September. The number of 3G users of Telenor network decreased from 8.227 million by end-August to 8.133 million by end-September i.e. registering a decrease of 0.094 million. The number of 4G users jumped from 7.264 million by end-August to 7.613 million by end-September. Ufone 3G users decreased from 6.997 million by end-August to 6.860 million by end-September. The number of 4G users of Ufone increased from 2.117 million by end-August to 2.249 million by end-September. Teledensity for cellular mobile decreased from 76.77 percent to 76.75 percent and broadband subscribers reached 74.15 million by end-September compared to 73.42 million by end-August 2019. The PTA received 7,294 complaints from telecom consumers against different telecom operators including (cellular operators, PTCL, LDIs, WLL operators and ISPs) as of September 2019. According to PTA data Jazz (Mobilink + Warid) leads the chart with 2,409 complaints and Telenor stands at second position as the most complained telecom operator with 1,644 complaints. The PTA said that it was able to get 7,282 complaints resolved i.e. 99.84 percent. Cellular mobile subscribers constitute major part of overall telecom subscriber base, therefore, maximum number of complaints belong to this segment. Total number of complaints against CMOs by September stood at 5993. In terms of the segregation of complaints on operator basis, a total of 2,409 complaints were received against Jazz which is 40.19% of the total CMO-related complaints. Telenor, which has the second largest number of consumers, was also second with 1,644 complaints i.e. 27.43 percent complaints were received against it. Ufone had 986 complaints against its various services which make up 16.45 percent of the total CMO related complaints. Zong stood fourth with 954 complaints i.e. 15.91 percent of total complaints. The PTA also received 504 complaints against basic telephony where 498 were addressed during September 2019. Further 793 complaints were received against ISPs and 787 of them were addressed.

(October 20, 2019) brecorder.com

Pakistan Telecommunication Authority (PTA) in collaboration with GSM Association (GSMA) organized one day Capacity Building training course on "Unlocking Rural Mobile Coverage" at PTA Headquarters, Islamabad. The training course was attended by representatives from MoIT, Cabinet Division, PTA, PEMRA, USF and Ignite. The training course focused on expanding mobile coverage in rural areas and the role of government-industry in closing the mobile broadband coverage gap. Mr. Calum Handforth, Senior Insights Manager, Connected Society, GSMA delivered the course. He provided the participants with a greater understanding of strategies to improve rural coverage and innovative models to tackle the challenges associated with digital divide. Speaking on the occasion, Chairman PTA, Maj. General Amir Azeem Bajwa (R) said that the course proved to be a valuable experience, one which addressed different key issues. PTA is doing its utmost efforts alongside other stakeholders in supporting economic growth and social development by bringing the power of the mobile and Internet to rural communities. The Chairman also thanked GSMA for this collaboration and assured of PTA's full support for future programs and trainings. This course was delivered under the "PTA-GSMA Centre of Excellence Program for Regional Regulatory Training" under which one training course is conducted on the latest topics of telecommunications and ICTs in every quarter of 2019 and 2020.

(October 16, 2019) pta.gov.pk

Saudi Arabia

Dr. Mohammed bin Saud Al-Tamimi has been appointed as governor of Saudi Arabia's Communications and Information Technology Commission, according to Saudi Press Agency. Al-Tamimi's appointment, announced on Monday, was made through royal decree by King Salman. (October 29, 2019) arabnews.com

Saudi Arabia's Ministry of Energy has outlined how it is adapting and maintaining its world-class defense against evolving global Cybersecurity threats. "Cyberattacks aimed at disrupting critical infrastructures are becoming more nuanced, advanced and difficult to spot. There can be no compromise when it comes to our defensive posture and we cannot afford any disruption or downtime. There is no margin for error as we expand, safeguard and diversify the Kingdom's future energy security," said Wahid S. Hammami, CIO, Ministry of Energy, speaking at GITEX Technology Week 2019. A key component of the Ministry's bid to reinforce its Cybersecurity and digital transformation credentials entails working with application delivery and multi-cloud application services expert F5 Networks to protect online services. Ensuring robust security and available, agile service delivery is more important than ever as the Ministry ramps up its central role in Saudi Arabia's era-defining Vision 2030 rollout. The government expects local energy consumption to increase three-fold by 2030, which will require combining hydrocarbon-based energy sources with renewables, as well as driving a host of cutting-edge R&D initiatives. To stay ahead of the curve, and to lay the foundation for future success, the Ministry deployed F5® BIG-IP® Local Traffic Manager™ (LTM). This enables it to move beyond mere load balancing to achieve intelligent, granular network control based on server performance, security, and availability. Because BIG-IP LTM is a full proxy, it is possible to inspect, manage, and report on all application traffic entering and exiting the network. It also helps simplify, automate, and customize application services faster and with greater predictably. LTM is augmented with F5® Advanced Web Application Firewall (Advanced WAF) to stop attacks before they reach applications, while also providing critical security controls to protect data both on-premises and in the cloud. "The threat landscape is vastly different than it was even a few years ago," said Hammami. "A traditional WAF was once enough to mitigate application layer attacks. This is no longer the case and keeping up with increasingly advanced attack tactics requires a step-change. Exploits are outpacing existing defenses and, even when a traditional WAF can mitigate the threat, the associated implementation and management can be problematic." F5 Advanced WAF addresses such challenges head on, providing malicious bot protection, application-layer encryption, API inspection, and behavioral analytics to defend against application attacks. It also addresses the problem of cybercriminals' increasing use of automation to scan applications for vulnerabilities, attack account credentials, or cause denial of service (DoS). With F5 Advanced WAF, the Ministry uses proactive bot defenses to stop automated attacks, leveraging a combination of challenge- and behavior-based techniques to identify and filter out bot traffic. Advanced WAF also includes F5 DataSafe, which encrypts data and credentials at the application-layer—without having to update the application. The Ministry's work with F5 to date also encompasses F5 BIG-IP Access Policy Manager (APM), which gives users easy, contextually secure and scalable access to applications and data, irrespective of device or location – from data center and the cloud to SaaS-based or hybrid environments. Meanwhile, data center and disaster recovery are handled by F5 global server load balancing (GSLB) to ensure the high availability of your global applications in all environments. F5 GSLB distributes user application requests based on business policies, data center and cloud service conditions, user location, and application performance. Underpinned by the BIG-IP platform, the solution delivers high-performance DNS services with visibility, reporting, and analysis. It can also hyperscale and secure DNS responses geographically to combat DDoS attacks and deliver a real-time DNSSEC solution. "Attacks against organizations in charge of critical assets will only continue to increase across the world, and Saudi Arabia is no different. The challenge is complex and fast-changing, which is exactly why we need to work with experts like F5 Networks that can scale and adapt to our operational and service-delivery ambitions, as well as the evolving challenges we face," added Hammami. (October 9, 2019) saudigazette.com.sa

Turkey

The 12th International Conference on Information Security and Cryptology started at the Information and Communication Technologies Authority. This year, the program was held with the theme of "Cyber Security and Post-Quantum Cryptology. Ömer Fatih Sayan, Information Security Association President Ahmet Hamdi Atalay, as well as many guests participated in the names. Minister Mehmet Cahit Turhan, who addressed the guests at the opening of the program, spoke about the point and effects of technology. Stating that the dangers in cyber or virtual environments do not only affect individuals, Turhan said, Cyber security has become one of the most important agenda items of institutions, countries and international organizations. With cyber-attacks, it is possible to obtain bank account information of a computer user, to reach the military and political secrets of a country, to make financial centers, power plants, transportation and communication systems and hospitals inoperable. Unfortunately, thanks to information and communication technologies, these opportunities that make our lives and our jobs easier can be used by malicious

people, foreign intelligence and terrorist organizations. " Turhan pointed out that as the cyber world becomes more complex, opponents become more complex. In fact, it is no secret that there are more organized attacks than personal attacks. Organized cyber pirates have emerged now. Unfortunately, these groups can attack the cyber infrastructure of state institutions and interfere with the private information of ordinary people. The problem has grown a lot with the introduction of quantum computers into our lives. For this reason, the spread of quantum resistant cryptology algorithms and studies in our country is of great importance. Because, in terms of providing cyber security, full security cannot be mentioned without "Domestic and National" products and solutions. We should not only follow the requirements of the age, but also take a step ahead and take precautions against threats. Because when the confidentiality, integrity or accessibility of the information is impaired; loss of life, large-scale economic damage, national security deficits or public order may be caused. We will not give up the use of information technologies in the presence of cyber pirates, he said. Deputy Minister Omar Fatih Sayan also made a speech. From artificial intelligence to profound learning, from web technologies to virtual reality, from machine learning to the internet of objects, from information security to cyber security, voicing advances in many areas, Sayan said: As a country that is aware of this fact, we are confidently and firmly focusing our investments on information and communication technologies ". Sayan pointed out the importance of recent developments in terms of showing what "domestic and national" technologies mean. Deputy Minister Sayan invited the participants to work in the field of domestic and national technology in all areas of life.

(October 16, 2019) btk.gov.tr

Serbia has signed a memorandum of understanding between the Regulatory Authority for Electronic Communications and Postal Services and the Information and Communications Authority. During the visit of President to Serbia, a consensus was reached in Belgrade to further strengthen the existing cooperation in the field of electronic communication and postal services between the Information and Communication Technologies Authority and its counterpart in Serbia, the Electronic Communications and Postal Services Regulatory Authority (RATEL). The existing memorandum of understanding signed between the two institutions in 2013 in Istanbul was reviewed and revised according to changing conditions. The text, which was updated to reflect the latest developments, was signed by BTM President Ömer Abdullah Karagözoğlu and RATEL Chairman Dragan Kovačević. The areas of cooperation in the Memorandum of Understanding; regulation of electronic communications markets, information technology and applications, regulation of postal services, and other issues to be agreed upon. Within these areas, sharing of information, documents, experience and experts between the two institutions, consultation on various issues and joint workshops, seminars, study visits are planned. The memorandum of understanding is an indication of the deepening of the cooperation between the two countries in the field of electronic communication and postal services and the intention of the parties to improve their existing friendship relations. It is also foreseen that the relations between BTK and RATEL, which are already on the basis of mutual benefit, will gain momentum and be placed on a more solid ground.

(October 9, 2019) btk.gov.tr

United Arab Emirates

An interactive workshop on bridging the standardization gap, hosted by the Telecommunications Regulatory Authority (TRA) in Dubai, has been concluded today. The workshop aimed to inform the participants of best practices in contributing to the global standard-setting process of the International Telecommunication Union (ITU) and provide in-depth guidance that will have a positive impact on the development of the telecommunication sectors in less developed countries. Over a period of two days, TRA hosted 30 guests from 15 developing countries in the ICT sector. During the workshop, an international ITU expert explained the differences in the capacity of developing countries compared to developed countries, in terms of access to international ICT standards, and the ITU recommendations in this regard. Commenting on this workshop, H.E. Majed Al Mesmar, Acting Director General of TRA, said: "Bridging the standardization gap is the theme of the ITU for this year, with the aim of understanding key gaps that need to be overcome to improve developing countries' standards development, implementation and use capabilities, and to increase the capacity of developing countries in ICT standardization and contribute to the achievement of sustainable development goals. At TRA, we are always keen to support all ITU initiatives, to enhance the work of this vital sector in all societies and contribute to the achievement of SDGs launched by the UN 'Leaving no one behind'." H.E. Al Mesmar assured that the importance of this workshop comes from the importance of the role of the ICT sector in achieving a decent life for people. He added: "The development and progress of countries today depend largely on the development of the ICT sector, as every industrial, commercial and educational renaissance depends on the existence of a modern communications infrastructure that can accommodate smart services, Fourth Industrial Revolution, Artificial Intelligence and smart education. This requires countries to identify and develop their true potential if they wish to keep abreast of developments and take advantage of modern technologies, which can be achieved through consultation and sharing experiences." The workshop participants learned about the comprehensive standard-setting approach within ITU-T, how to submit written contributions independently to the ITU-T study groups, and gained the ability to understand the standardization process and the importance of Plenipotentiary Conference Resolution no. 123 and World Telecommunication Standardization Assembly Resolution no. 44 on "Bridging the standardization gap between developing and de-

veloped countries". The workshop also aimed to discuss emerging strategies, technologies and ICT standards that can play a role in the sustainable provision of telecommunication and broadband Internet systems in rural and remote areas. The workshop also addressed innovation in the ICT sector, which plays a major role in bridging the broadband gap in developing countries. Moreover, the ITU launched the Bridging the Standardization Gap initiative in 2009, with the aim of addressing the differences in developing countries' capabilities compared to developed countries by accessing, implementing and influencing international standards, as well as facilitating the participation of developing countries in the ICT standard setting process, and enabling developing countries to benefit access to new technological developments. TRA has earn the world's confidence by successfully organizing and hosting the most important ITU events. TRA hosted the Plenipotentiary Conference 2018 same time last year, which is the main ITU event held every four years, with more than 2,300 participants of senior leaders from 180 countries. (October 22, 2019) tra.gov.ae

The United Arab Emirates, represented by the Telecommunications Regulatory Authority, TRA, has chaired the annual meeting of the ITU Council Working Group on Child Online Protection, COP, at the ITU headquarters in Geneva. The meeting, chaired by the TRA's Abdelaziz Al Zarooni, saw participants discuss the development of global COP guidelines and the exchange of experiences among Member States on the best ways to build efficient and effective programmes to raise parents and children's awareness about technology risks and safe use. The UAE also participated in a number of meetings on the sidelines of the gathering, including the Council Working Group on Financial and Human Resources, the Council Working Group on International Internet-Related Public Policy Issues, the Council Working Group on World Telecommunication/ICT Policy Forum, WTPF, the Council Working Group on WSIS and SDGs, and the Council Working Group on COP. The meetings of the Council deal with topics that define the ITU standards and the international protocols and conventions underpinning the global telecommunications system. These meetings also identify emerging technologies of future networks and services in support of the Fourth Industrial Revolution and the process of digital transformation. On chairing the annual meeting of the ITU Council Working Group on COP by the UAE, Hamad Obaid Al Mansoori, TRA Director-General, said, "Chairing this meeting reflects the UAE's strong position in international forums and the confidence it enjoys in the global arena. It also highlights the UAE's leading role in achieving the safety of individuals and communities on the internet, thus enhancing happiness, prosperity and security all over the world." "Today," he added, "the UAE is ranked as one of the safest countries in the world, and by chairing the Council's Working Group on COP, it contributes to the dissemination of its successful experience in this field, leading to a safer digital space that allows children and adolescents to develop their skills and abilities in a safe environment." The UAE has been elected as member of the ITU Council for the fourth consecutive time for Asia and Australia, receiving 164 votes. The UAE's election took place at the 2018 Plenipotentiary Conference, hosted by the UAE in Dubai in 2018. (October 7, 2019) wam.ae

The UAE is ranked first in the Arab Region and fourth globally in the launch and use of 5G networks, according to the Global Connectivity Index (The Connectivity Index), issued by Carphone Warehouse, specialized in technology benchmarking. The UAE is also the third globally in the overall ranking of the index, which measures the Total Connectivity Rating (Most Connected Countries) through four pillars: the movement infrastructure, information technology, global connectivity and social connectivity. This achievement is the result of the efforts of the telecommunications sector in general, and the Telecommunications Regulatory Authority (TRA) as the main driver of the launch of the 5G in the country. In recent years, TRA has worked in cooperation with operators to raise the telecom sector readiness to enter this state-of-the-art technology, which contributes to the UAE's global leadership and makes it first to deploy and operate 5G networks. In this context, H.E. Hamad Obaid Al Mansoori, TRA Director General, said: "The UAE is reaching positions and achievements on daily basis, which confirms its leadership and global competitiveness. A few days ago, the UAE has been ranked first in the Arab Region and 12th globally among the most competitive countries in the Digital Competitiveness Ranking 2019. Today, we are ranked first in the Arab Region and fourth globally in the use and application of 5G, ahead of the most advanced countries in the world. We will continue to strive for the lead with determination and strength, guided by the directives of our wise leadership, to achieve the UAE Vision 2021 and the National Agenda Goals." H.E. Al Mansoori indicated that this achievement shows that the UAE is on track to complete the digital transformation and enter the age of Artificial Intelligence and the Fourth Industrial Revolution. He added: "5G is the key to the future, and the main foundation for civilization milestones that the world will witness in the next few years. In the UAE, in the light of these facts, it is evident that we need to accelerate strategies and plans of 5G in terms of foresight, analysis and planning, in preparation to the transition from smart government to a full intelligent lifestyle where machines, devices and places connect in all directions to serve humanity. We have established the 5G Committee, in conjunction with the launch of the UAE 5G Strategy, which has held regular meetings with all sectors to identify their needs in relation to supportive operations for their activities in the ICT sector, to provide coverage and hardware support for 5G projects nationwide." TRA started implementing and using IMT2020 technology, known as 5G, at the end of 2017, as licensed operators of telephone networks started to prepare the infrastructure to deal with the requirements of the next phase, including the use of harmonized spectrum bands, and significant development of ICT infrastructure. As part of its efforts to launch IMT2020 services, TRA has formed three Working Groups under the National 5G Steering Committee. The Groups work in a coordinated manner in spectrum, networks and sectors concerned to assist the 5G National Steering Committee in preparation for the next phase, including the development of a regulatory framework to support stakeholders and partners in the ICT sector in testing 5G networks and optimize their use. The transition to 5G will enable the UAE to achieve its goals in terms of global competitiveness, especially its stated goal of achieving the first global position in online government services, and a top ten position in the ICT infrastructure readiness. The UAE will be at the forefront of countries entering the 5G club is in line with the leadership's vision and the UAE vision 2021 to make the country one of the best countries in the world. (October 3, 2019) tra.gov.ae

REGULATORY ACTIVITIES BEYOND THE SAMENA REGION

Albania

The Electronic and Postal Communications Authority (Autoritetit Te Komunikimeve Elektronike Dhe Postare, AKEP) has this week awarded the country's second largest cellco Telekom Albania an 800MHz band mobile spectrum license, the regulator disclosed on its website. After launching a license tender in August, AKEP's Steering Council approved the award of 2×10MHz of spectrum (811MHz-821MHz/852MHz-862MHz) – Block 'A3' –to Telekom Albania, and the allocation was formally completed on 7 October after the operator fulfilled its financial obligations. The starting bid price for the 15-year license was set at EUR7.44 million (USD8.16 million). Telekom is expected to utilize the new frequencies for expanding and improving 4G LTE services currently operating in the 1800MHz and 2600MHz bands. In an earlier tender in February 2019 mobile market leader Vodafone Albania claimed the 'A2' 800MHz block (801MHz-811MHz/842MHz-852MHz), which it added to its existing 1800MHz/2600MHz 4G resources. A third 800MHz block – 'A1' (791MHz-801MHz/832MHz-842MHz) – remains unclaimed, with Albania's third-placed cellco ALBtelecom (also an LTE 1800MHz/2600MHz operator) apparently yet to come forward with a bid. (October 10, 2019) telegeography.com

Angola

Angola's President Joao Lourenco appointed a new Board of Directors for state-owned fixed line operator Angola Telecom, led by Adilson Miguel dos Santos as its new CEO. The move is significant as it reportedly marks the conclusion of the telco's restructuring process, aimed at streamlining the company for subsequent privatization. Prior to the appointment of the Board, Angola Telecom was managed by an Interim Management Committee. The government aims to sell a 45% stake in the telephony and broadband provider, which holds a 'unified global' mobile, fixed, internet and pay-TV license. (October 10, 2019) News Agency ANGOP

The Angolan government has launched the public tender for the assignment of the country's fourth 'Unified Global' operator license covering mobile, fixed line, broadband and TV services. Telecoms regulator INACOM announced that candidates have until 8 November 2019 to submit their initial applications for pre-qualification. In a second phase, qualified candidates will submit their full technical and financial proposals within 60 days for consideration by the Evaluation Committee. Interested parties can access details of the process, submit applications, request clarifications and submit proposals on the Public Procurement Portal (www.compraspublicas.minfin.gov.ao). The tender is being steered by an inter-ministerial working group, after Angola's President Joao Lourenco cancelled the award of the fourth license to local start-up Telstar Telecomunicacoes for procedural non-compliance in April 2019. Lourenco demanded higher levels of transparency in the relaunched tender. Current Unified Global licensees are Unitel, Movicel and Angola Telecom. (October 2, 2019) telegeography.com

Australia

The federal government has commenced proceedings to auction 2.4GHz of spectrum in the 26GHz band as part of the national rollout of 5G services. It comes shortly after Communications Minister Paul Fletcher directed the Australian Communications and Media Authority (ACMA) to prepare for the reallocation of 2.4GHz of millimeter-wave (mmWave) spectrum in the 26GHz band, which includes 25.1GHz to 27GHz. "The Morrison government is allocating this spectrum to support a number of important communications policy objectives, including the rapid deployment of 5G technologies, the promotion of competitive market outcomes, and encouraging investment in infrastructure across both metropolitan and regional Australia," he said. Fletcher added that when 5G is rolled out, it would support a range of current and future use cases, including streaming ultra-high definition video, teleworking from regional centers, and autonomous vehicles. To evaluate the potential co-existence between NBN's Sky Muster satellite services and 5G mobile broadband services in the 27 to 27.5GHz frequency range, the federal government commissioned Plum to a produce an independent report. The report concluded that the reallocation of spectrum in the 26GHz band would have minimal impact on the NBN Sky Muster satellite services. "The study concludes that the risk of interference is insignificant and that the mitigating license conditions proposed by ACMA are appropriate," the report said. The conclusion matches the same findings by the ACMA that found there is no risk of interference to the satellite uplinks from new terrestrial services, despite

the NBN undertaking a separate analysis which had indicated that such interference is possible, the report said. Fletcher has written to the Australian Competition and Consumer Commission (ACCC) seeking advice on allocation limits ahead of the auction, which is scheduled for early 2021. The auction will be the first opportunity Australian telcos will be able to access mmWave spectrum. At the end of last year, the ACMA auctioned off 125 MHz of spectrum in the 3.6GHz band. In total, Telstra paid AU$386,008,400 for 143 lots; the TPG-Vodafone Australia joint venture Mobile JV paid the next most, at AU$263,283,800 for 131 lots; Optus paid AU$185,069,100 for 47 lots; and Dense Air Australia paid AU$18,492,000 for 29 lots. The ACMA made AU$853 million from the spectrum auction, the equivalent of around AU$0.29/MHz/pop. In July, a study of 43 devices conducted by Enex for the ACMA showed how 5 GHz WIFi outperformed 2.4GHz in long-range testing, negating a major reason to continue using the slower 2.4GHz band. "The 2.4GHz band is often promoted as a better choice for longer range communications," Enex said in its report. "However, Enex's findings did not support this. Operating in the 5GHz band appears to be the best choice for consumers under all circumstances." "The 5GHz band also has the benefit of more recent technology developments which includes features such as directional beamforming and MU/MIMO (with up to eight antennas and multiuser sub-channels)." (October 27, 2019) zdnet.com

NBN Co, the company overseeing the construction and management of Australia's National Broadband Network (NBN), has been formally warned for discriminating between retail service providers (RSPs) with relation to the supply of upgraded NBN infrastructure to business customers. In a press release regarding the matter, the Australian Competition and Consumer Commission (ACCC) said that having issued the warning, it had also accepted a court-enforceable undertaking from NBN Co, which includes a commitment by the company to take measures to ensure such conduct is not repeated. According to the ACCC, it had determined that from at least January 2018 NBN Co offered materially different commercial terms to different RSPs as it upgraded NBN infrastructure to support high speed, business-grade services. Further, the regulator also claimed that it had provided one RSP with indicative pricing information for its new Enterprise Ethernet service months before it gave the same information to other RSPs. Following the ACCC's investigation, NBN Co was said to have admitted that it did not have appropriate processes in place to ensure it was complying with its transparency and non-discrimination obligations. As part of the court-enforceable undertaking, the firm has reportedly committed to offering consistent contract terms to RSPs for the supply of upgraded NBN infrastructure. It has also committed to providing the same information to its customers at the same time, while it will put in place extensive compliance arrangements, including an annual independent audit of its compliance with its non-discrimination obligations. Commenting, ACCC chairman Rod Sims said: 'The ACCC has concluded that NBN Co failed to comply with its non-discrimination obligations on a number of fronts … These legal obligations were enacted to ensure that NBN Co does not distort competition in the market for retail NBN services, such as by favoring larger RSPs.' He added: 'In this case, the ACCC has not identified evidence that the conduct resulted in specific harm or competitive detriment before it came to light … Despite this, the ACCC is satisfied that NBN Co's conduct amounted to a serious breach of its non-discrimination obligations. The undertaking we have accepted from NBN Co is intended to ensure that all access seekers can compete on an equal footing going forward.'
(October 10, 2019) telegeography.com

A number of measures have been proposed by the Australian Competition and Consumer Commission (ACCC) aimed at improving NBN Co's wholesale service levels, including a reworked rebate structure for missed appointments, late connections and unresolved faults. In a draft decision, the regulator has put forward new regulated wholesale terms for the service standards NBN Co provides to retail service providers (RSPs), noting that the proposals are in response to concerns raised by stakeholders during its National Broadband Network (NBN) wholesale service standards inquiry. Among the proposed changes from existing wholesale arrangements are: a change to the structure of rebates for late connections and fault repairs to apply on a daily basis, rather than as a one-off payment, and an increase in the size of these rebates; an increase in the size of rebates for missed appointments by NBN technicians, from AUD25 (USD17) to AUD75, with a requirement that RSPs pass this rebate on to consumers; the introduction of monthly AUD20 rebates for fixed wireless services in congested cells or connected to congested backhaul links, as well as rebates for fixed line services that fail to meet certain minimum speed objectives; and the implementation of enhanced reporting, measurement and automation requirements to promote better communication, transparency and coordination. With the ACCC having invited feedback on its proposals by a deadline of 1 November 2019, chairman Rod Sims said of the matter: 'The new arrangements are designed to give NBN Co more incentives to lift its service standards to RSPs, which should, in turn, improve service to NBN consumers by reducing instances of missed appointments, delayed connections and unresolved faults … We have heard long-standing concerns from consumers about how frustrating, inconvenient and costly these issues can be. We need to see more action from NBN Co and RSPs, especially now that the NBN rollout is entering its final stages.' (October 1, 2019) telegeography.com

Belgium

The Flemish government of incoming Prime Minister Jan Jambon will priorities the deployment of a regional 5G network, according to the 2019-2024 coalition government agreement published at the end of September. With preparations for Belgium's multi-band frequency auction subject to significant delay as a result of political wrangling, Flanders is keen to deploy an 'area-wide 5G network based on an open model of infrastructure sharing whereby all service providers can offer their service on equal terms', notes the agreement, adding that: 'To guarantee this model, the Flemish government needs to participate substantially in the operators' initiatives'. Flanders envisages earmarking 60MHz of spectrum for regional applications, based on a regional licensing model. That 60MHz spectrum would be in the 3.5GHz band if there is no fourth mobile operator or via network slicing. Otherwise, the spectrum will be allocated in the 3.8GHz band. The plan would give new players the opportunity to purchase spectrum for a specific demarcated area, such as airports, ports, large business parks and city centers. 'For that, we want to move away from a 20-year allocation period and to more dynamic, short-term allocations that also allow spectrum allocation for specific events, festivals, sporting events or other applications,' the statement continued. In order to implement the plan, the government notes it is 'negotiating with the federal government for a considerably higher share in the distribution of the one-off and annual revenues from the auction of the mobile broadband spectrum. This spectrum auction must be separate from the issue of the fourth player.' The Belgian federal government presented plans in mid-2018 for a multi-band auction that was scheduled for the end of 2019. However, discussions have been delayed by disagreement over how the anticipated EUR680 million (USD745.6 million) raised by the sale would be distributed. (October 4, 2019) telegeography.com

Brazil

Brazil's government is ready to send to Congress three new bills to foster the development of the country's telecommunications industry, including rules on deployment of antennae and data centers, ahead of a long-awaited auction for fifth-generation frequencies, an official said on Tuesday. "They are practically ready, but first we wanted to get the new regulatory framework approved by Congress," said Julio Semeghini, executive secretary at the Ministry of Science, Technology, Innovation and Communications. He spoke during a telecoms event in Sao Paulo, referring to a bill known as PLC 79, which is expected to unleash a wave of asset sales and benefit the entire industry. Semeghini said the modernization of Brazil's telecoms law is likely to boost investment in the sector and is essential for the deployment of 5G broadband service. "Some carriers will more than double their investments in the next few years," he said. Regulatory agency Anatel had planned to carry out a spectrum auction for 5G in March 2020 but is now likely to postpone it, as analysis on potential interference with other services is still ongoing. "It will be next year, but I don't want to talk about dates as Anatel is still looking at all the specifications," the secretary said. Semeghini added that the government is also engaged in putting together a regulatory framework for startups. He said there are 12,000 startups in Brazil, including eight new companies valued at more than $1 billion, creating more than 30,000 jobs. (October 29, 2019) reuters.com

In a widely expected move – and one that could benefit struggling operator Oi SA – Brazil's President Bolsonaro has signed a new law aiming to modernize the country's telecommunications sector. According to Reuters, the law lifts restrictions on sales by fixed line and cellular telecommunications companies of their formerly state-owned assets. It will also allow for a secondary market for trading cellphone frequencies. Fixed-line concession holders will now be allowed to migrate their licenses to a private regime in which they can more freely allocate investments to expand broadband services. In addition, satellite companies will be able to apply directly for frequencies, rather than through auctions. Brazil's regulatory restrictions on Brazil's telecommunications sector have, it seems, been eased at a stroke: certainly there were no last-minute changes in Congress or vetoes by the president. However, the law took five years to clear Congress. The law has been widely welcomed by analysts and commentators and, one assumes, service providers, not just because it makes it easier for them to do business but because it is expected to free up resources for the expansion of internet access for Brazilian end users. A less heavily regulated telecommunications sector may also be a boost for beleaguered operator Oi. Oi has been in discussions with a number of major names in the telecommunications world, including Telefonica, Telecom Italia Group, AT&T and China Mobile, about the planned sale of its mobile unit, which could give it enough cash reserves to avoid insolvency.

(October 7, 2019) developingtelecoms.com

Chile

The Department of Telecommunications (Subtel) has launched a tender for a 'National Fiber-Optic (FON)' project aiming to deploy 10,000km of fiber infrastructure across the country. The government has allocated a subsidy of CLP86 billion (USD120 million) for the program, which will see the allocation of contracts in six subdivisions: Arica and Parinacota Macrozone (Arica and Parinacota regions); Northern Macrozone (Antofagasta and Atacama regions); Central Northern Macrozone (Coquimbo, Valparaiso and Metropolitan regions); Central Macrozone (O'Higgins and Maule regions); Central Southern Macrozone (Nuble and Biobio regions); and Southern Macrozone (Araucania, Los Rios and Los Lagos regions). Interested parties are given 60 working days to submit their bids (until 7 January 2020), with the winners scheduled to be announced by March 2020. (October 15, 2019) telegeography.com

The Department of Telecommunications (Subsecretaria de Telecomunicaciones, Subtel) has unveiled a new 5G consultation, as it seeks to gauge interest in the potential distribution of 'Limited Telecommunications Services' concessions for businesses. The consultation is targeting the mining, port, agricultural, industrial and transport sectors, and seeks feedback regarding the technical, legal, administrative and economic elements of a potential tender. Also under discussion are potential 5G bands, with 1700MHz/2100MHz, 3.5GHz and 28GHz bands all under consideration by the regulator. The consultation opened on 9 October and will run until 23 October. The Chilean watchdog previously staged a 5G consultation in May this year, earmarking the following spectrum for auction: 20MHz in the 700MHz range; 30MHz in the 1700MHz (AWS) band; 50MHz in the 3.5GHz range; and 850MHz in the 28GHz range. To date, Chilean 5G testing has focused on the use of millimeter wave (mmWave) spectrum, with Claro and Entel both staging trials in recent years. Entel's most recent 5G trial took place in June this year, using a six-month trial license (issued in February 2019) incorporating the 28GHz band. The test was carried out in conjunction with Ericsson and Qualcomm and saw the telco assist with the performance of a remote ultrasound scan. (October 11, 2019) telegeography.com

China

After more than a decade under consideration, mobile number portability (MNP) will be made available across China from 30 November. As per the report, pilot projects took place in the provinces of Tianjin, Hainan, Jiangxi, Hubei and Yunnan in September, and MNP is now live in each location. The remainder of the country's provinces – including autonomous regions under government control – will introduce portability on a rolling basis between 10 November and 25 November, and the government hopes to confirm nationwide availability by the end of that month.
(October 18, 2019) CCTV

Colombia

The Ministry of Information Technologies and Communications (MinTIC) has published its final resolution on the long-delayed auction of mobile spectrum in the 700MHz, 1900MHz and 2500MHz bands, setting a date of 12 December 2019 for the license bidding. MinTIC has invited potential bidders to study the requirements and conditions for participating in the auction process, which it said will help reduce the digital divide in communities nationwide, especially in rural and remote areas currently lacking mobile broadband connectivity. Up for grabs in the tender is 2×45MHz of 700MHz spectrum (703MHz-748MHz paired with 758MHz-803MHz) split into four 2×10MHz blocks and one 2×5MHz portion; plus a 2×2.5MHz 1900MHz band allocation and eight 10MHz blocks in the 2500MHz band. New spectrum is expected to be utilized initially for 4G services (augmenting existing 1700MHz/2100MHz [AWS] and 2600MHz-based LTE networks) while the 700MHz band has also been earmarked for 5G rollout. Licenses will be issued for 20 years, compared to existing ten-year cellular concessions, with no minimum bid price but with key assessment criteria focusing on applicants' technical proposals, rollout schedule and investment plans.
(October 15, 2019) telegeography.com

Czech Republic

Following a public consultation on the draft terms and conditions of the auction of 5G network frequencies in the 700MHz and 3400MHz–3600MHz (3.5GHz) bands, the Czech Telecommunication Office (CTU) has revised its framework dates for conducting the selection process, with the call for tenders postponed from autumn 2019 until the beginning of January 2020. The watchdog is seeking to allocate the frequencies in a bid to bolster competition in the Czech market where high prices have long been criticized by politicians and end users alike. In communique Ref. No: CTU-42 109/2019-613 dated 15 October, the CTU issued the following timetable:

- Call for tenders (publication of documentation): beginning of January 2020
- Application for tender: mid-February 2020

- Launch of electronic auction: April 2020
- Issue of the decision on the allocation of radio frequencies: July 2020.

The schedule is, however, only indicative and therefore subject to change. In June this year the CTU published the draft plan of the 5G auction, whose terms and conditions are based on previously published principles which the regulator has documented over the past year in its efforts to maximize the transparency of the selection process. The regulator notes that, in order to fulfil one of the main objectives of the auction – which is to deepen competition on the electronic communications market – it is reserving a 2×10MHz block of spectrum at 700MHz for a new operator(s). Further, newcomer(s) will be allowed to compete for another 5MHz, but if none of the new entrants in the first auction round show interest in this reserved block, it will open it up and offer it to all auction participants. Concurrently, in the 3.5GHz band the CTU says it will set 'a new spectral limit for the new operator compared to the existing operators'. Additional Ts&Cs include the rule that any existing operators participating in the 700MHz band auction will assume a national roaming commitment (valid for six years), and what the watchdog terms 'development criteria that ensure that frequencies are handled efficiently'.

(October 18, 2019) telegeography.com

Ethiopia

Ethiopia could have no fewer than three telecoms operators active as early as April 2020, if the current plans to liberalize the telecoms sector are realized. With a view to preparing for market liberalization, the country's new telecoms regulator, the Ethiopian Communications Authority (ECA), is reported to have launched a public consultation process ahead of issuing any new concessions. It is understood that the ECA aims to gather feedback from interested parties regarding the proposed legal framework which would pave the way for the entrance of two new telecoms providers, with a deadline for submissions of 22 November having been set. Meanwhile, Reuters reports that the ECA will hold a meeting in Addis Ababa on 12 November to answer questions regarding its liberalization plans from interested parties. Should the regulator stick to its proposed timetable, it expects to issue licenses in March 2020, with ECA director general Balcha Reba cited as saying at a press briefing: 'We expect the country to have three telecom operators starting from April.' Earlier this year, in June 2019 the Ethiopian parliament approved the 'Proclamation for the Regulation of Communications Services', new legislation which underpins the planned liberalization of the country's telecoms sector – which currently remains a monopoly of Ethio Telecom – and also allowed for the establishment of the independent regulatory body, the ECA, which was subsequently created in September 2019. (October 24, 2019) Addis Fortune

Ethiopia plans to award two telecoms licenses to multinational mobile companies by April 2020, the new communications regulator said on Tuesday, an apparent delay in the timeline officials had previously set. Balcha Reba, director general of the Ethiopian Communications Authority, gave the date at a press conference. In June, Reuters reported that Ethiopia would issue the licenses by the end of the year, quoting Ethiopian officials and telecoms executives with direct knowledge of the process. The issuing of licenses will end a state monopoly and open up one of the world's last major closed telecoms markets in the country of around 100 million. Prime Minister Abiy Ahmed launched a push to liberalize the country's economy last year. The communications regulator, formed after parliament passed a law covering the liberalization of the sector, will hold a meeting on Nov. 12 in the Ethiopian capital to answer questions of interested companies, Balcha said. Vodafone, South African operator MTN, France's Orange and Etisalat of the United Arab Emirates are likely to be among the leading contenders vying for entry into the Ethiopian market.

(October 22, 2019) af.reuters.com

The Ethiopian government could cede majority control of its telecoms monopoly once it has completed an initial phase of privatization in 2020. In an interview Balcha Reba, Director General at the Ethiopian Communications Authority, said the government could release additional shares after concluding a sale of a 49 per cent stake in the operator, which is expected to happen in 2020. However, Reba added the market would have to become more competitive and mature before an additional sale could be considered. Ethiopia's telecoms sector is set to undergo a major shake-up in 2020. On top of the privatization plan, the government will also split the operator into two businesses, separating services and retail from its mobile and fixed network infrastructure assets. The country is also set to break Ethio Telecom's monopoly by issuing two mobile operating licenses in March 2020. In the interview, Reba indicated the market could be opened up further, with the sale of more licenses in the long-term. This is likely welcome news for Orange, Vodacom and MTN, which have all indicated they would be interested in entering Ethiopia, one of the last major markets on the continent that is currently closed off to international operators. (October 10, 2019) Bloomberg

France

French telecom regulator Arcep has approved the implementation of the so-called 'access ID card' enabled by an API, which will be installed in operators' boxes to collect useful information on fixed broadband lines, such as the type of access network used by the end-user (copper, cable, fiber), the headline speed of the service, and the strength of the Wi-Fi signal. The initiative is part of the regulator's efforts to monitor the actual quality of service experienced by broadband users, relying on a data-driven approach. Its execution will aim to increase the accuracy of fixed internet QoS campaigns, replacing the previous method based on tests in a controlled environment. Publishing its decision, Arcep said that the QoS measurement tools participating in the project cannot receive any information linked to the user's identity, adding that the country's privacy watchdog (CNIL) was satisfied that the new API complied with data privacy requirements. In line with the draft document published in April, the 'access ID card' will become a compulsory feature in operators' boxes used in the residential market, connected via current fixed broadband networks (copper, cable, fiber), as well as fixed 5G connections in the future. The obligation applies to broadband providers with at least 1 million subscribers and covers versions of boxes used by at least 30,000 customers. Operators will have roughly two years to install the API on the first boxes, with a target of 95 percent of eligible equipment within 30 months.

(October 28, 2019) telecompaper.com

Arcep has launched a public consultation on its plans to extend the frequency authorizations of Orange in Mayotte (900MHz) and Reunion (900MHz and 1800MHz). The regulator said that the two licenses expire in March 2021; Arcep is aiming to extend the concessions to 30 April 2025, to coincide with the expiry of the licenses of SRR and Telco OI (Reunion) and SRR, Telco OI and Maore Mobile (Mayotte).

(October 28, 2019) telegeography.com

The telecoms regulator Arcep has approved eleven initiatives aiming to trial 5G technology in the 26GHz band. The regulator said that the trial concessions authorize the holders to use the assigned spectrum for a period of up to three years. The selected firms must have an operational 5G trial network by 1 January 2021 (at the latest) and make it available to third parties to perform their own 5G trials. They must also publish the terms and conditions for accessing the trial network and provide Arcep with a detailed report on the trials conducted via the platform. The selected initiatives are as follows: Cite des Sciences et de l'Industrie (Universcience, Nokia; 26.5GHz-27.3GHz), Velodrome National (Saint-Quentin-en-Yvelines, Nokia, Qualcomm, Airbus and France Televisions; 26.5GHz-26.9GHz), Bordeaux (Bordeaux Metropole, Bouygues Telecom; 26.5GHz-26.9GHz), Le Havre (Grand Port of le Havre, Siemens, EDF, Nokia; 26.5GHz-27.3GHz), Velizy (Bouygues Telecom; 26.5GHz-26.9GHz), Saint-Priest (Bouygues Telecom; 26.5GHz-26.9GHz), Gare de Lyon Part-Dieu (SNCF, Bouygues Telecom; 26.5GHz-26.9GHz), Piteaux (Paris Defense; 26.5GHz-27.3GHz), Nozay (Alcatel Lucent International; 26.5GHz-27.5GHz), Chatillon (Orange; 26.5GHz-27.5GHz) and Station of Rennes (SNCF, Orange; 26.5GHz-27.5GHz). Arcep also said that it plans to allocate spectrum for 5G use in the 3.4GHz-3.8GHz band in 'a few weeks'.

(October 11, 2019) telegeography.com

The regulator Arcep is inviting interested parties to join a new IPv6 task force, as the industry is facing a shortage of IPv4 addresses. According to international organization RIPE-NCC (Reseaux IP Europeens Network Coordination Centre), the remaining pool of IPv4 addresses (1.03 million as of 01 October) is now smaller than the number waiting to be assigned. The regulator has once again renewed its call for action, reminding all stakeholders that the transition to IPv6 is vital for the industry.

(October 5, 2019) telecompaper.com

The Authority of Regulation for Electronic Communications and Posts (Arcep) has opened a consultation regarding the extension of certain spectrum licenses held by Orange Reunion and Orange Mayotte, as it seeks to harmonies its licensing regime. The frequency permits in question – which incorporate the 900MHz band in Mayotte and 900MHz/1800MHz spectrum in Reunion – are set to be extended from 24 March 2021 until 30 April 2025, but the watchdog is keen to gauge feedback from industry players before going ahead. Arcep seeks to extend the licenses, which were awarded in 2006 (No. 2006-0141) and 2007 (No. 2007-0156), so that they expire alongside concessions issued in 2016. The consultation will remain open for feedback until 4 November 2019.

(October 4, 2019) telegeography.com

Germany

The German Federal Ministry of Finance is looking to impose higher taxes for companies using their own 5G frequencies in factories, Handelsblatt reported, a move which could increase fears about stagnation of the technology in the market. The authority is reportedly pushing for a quintuple increase of the current fees. At the same time, the Federal Network Agency in Germany had reportedly claimed that companies would have to pay relatively low fees, depending on the size of the area where 5G masts would be installed. At the 5Germany Telekom conference last week Germany's Federal Transport Minister Andreas Scheuer said

the Federal Network Agency will soon publish the necessary procedure for providing big German companies with 5G masts. He added that the project is being coordinated between the departments. Such a move by the financial authority in Germany would induce significant challenges in a market that has been repeatedly criticized by operators for the higher price of the 5G spectrum and the lengthy process of the auction of suitable frequencies which was concluded in June.

(October 4, 2019) mobileworldlive.com

The Federal Network Agency (FNA, known locally as the Bundesnetzagentur or BNetzA) has annulled a charge that Vodafone Germany imposed on other wireless operators for the porting of customers' mobile phone numbers. After comparing the price with other European nations, the regulator has now set the fee at a maximum of EUR3.58 (USD3.90), which will apply for all of Germany's mobile operators.

(October 1, 2019) telegeography.com

Ghana

Ghana's Deputy Minister of Communications, Vincent Sowah Odotei, has revealed the government is working with mobile network operators to ensure 95% of the country's population has access to internet connectivity by the end of 2020. Mr. Sowah Odotei said the Ministry's Ghana Investment Fund for Electronic Communications (GIFEC) has built about a thousand communication towers in very remote areas as part of efforts to achieve the target. GIFEC agreed an 18-month partnership with the GSMA and Vodafone Ghana in July to deploy mobile internet solutions in unconnected rural communities as part of the Connected Society Innovation Fund for Rural Connectivity.

(October 30, 2019) Ghanaweb

The Minister of Communications, Ursula Owusu Ekuful, has announced that all mobile phone SIM cards will be deactivated unless re-registered between 1 January and 30 June 2020. Subscribers will need to present a national biometric identity card, such as a driver's license, passport or Ghana Card, as part of a program conducted by the National Communications Agency (NCA) with the cooperation of telecom companies. The Minister told a press briefing that the measure will help law enforcement agencies identify SIM card owners, track criminals, curb incidents such as phone theft, hate text messages, mobile fraud activities, incitement to violence and other crimes.

(October 15, 2019) Ghanaweb

Greece

The Greek government has made an announcement regarding the process for freeing the 700MHz band for 5G mobile services. A joint press release by the Ministry of Digital Governance and the Prime Minister's office says that frequencies in the 700MHz range currently used by TV broadcasters will be awarded to cellcos in 2021. This will follow a 5G auction in the 3.5GHz band in 2020. The government says that broadcasters must have switched to new bands by 1 January 2022, although under a new amendment, in a few isolated cases standard transmissions will still be allowed in areas 'where there is no technically feasible way to transmit a high resolution signal'.

(October 25, 2019) telegeography.com

Hong Kong

China Mobile Hong Kong (CMHK) and HKT have both acquired 40MHz of 5G spectrum in the 4.9GHz band for the reserve price of HKD120 million (USD15.3 million) each. Spectrum will be assigned in December and licenses will be valid for 15 years. Last week the four incumbent cellcos – HKT, CMHK, Hutchison 3 and SmarTone – paid a combined HKD1.006 billion for 5G-capable 3.5GHz licenses. Hutchison and SmarTone opted not to take part in the 4.9GHz sale. In a statement HKT said: 'The 4.9GHz band spectrum is strategically important as it will raise the overall speed and capacity of HKT's 5G service. In addition, we can deploy the spectrum to enhance our coverage in the two highly populated "restriction zones" in Hong Kong South and New Territories East, where the presence of satellite stations could cause interference with the 3.5GHz band.' (October 24, 2019) telegeography.com

Hong Kong's auction of 5G-capable spectrum in the 4.9GHz (4.84GHz-4.92GHz) band has attracted just two bidders. The Office of the Communications Authority (OFCA) says that all four incumbents submitted initial applications, but Hutchison 3 and SmarTone have withdrawn since winning 3.5GHz licenses earlier this week. That leaves China Mobile Hong Kong (CMHK) and HKT in the running for the 4.9GHz frequencies, adding to the 3.5GHz spectrum that they too won this week. Mainland China is also using the 4.9GHz waveband, with CMHK's parent company China Mobile having already been issued with spectrum in that range. CMHK is obviously keen to win similar frequencies in Hong Kong to allow for roaming, which is an important part of the business for Hong Kong cellcos.

(October 17, 2019) telegeography.com

The government of Hong Kong has awarded 5G spectrum licenses in the 3.5GHz band to the territory's four incumbent cellcos. The auction for 200MHz of frequencies raised a total of HKD1.006 billion (USD128 million) in spectrum utilization fees (SUFs). China Mobile Hong Kong (CMHK) paid HKD300 million for 60MHz of spectrum, while HKT and SmarTone offered HKD252 million each for 50MHz, and Hutchison 3 won 40MHz with a bid of HKD202 million. Spectrum will be handed over on 1 April 2020 and licenses are valid for 15 years. In a press release HKT stated: 'HKT welcomes the government's decision to set modest reserve and round prices for the auction to facilitate the development of 5G in Hong Kong. We are pleased that, as a result of rational biddings, HKT is able to obtain 50MHz of contiguous spectrum at a price that is beneficial to the industry as well as the mobile users. This reasonable SUF level represents additional incentives for the industry to invest in 5G development and promote the adoption of 5G by the public.'

(October 15, 2019) telegeography.com

India

Following a ruling by India's supreme court which upheld a demand by the Department of Telecommunications (DoT), the nation's mobile network operators (MNOs) will be required to pay a total of INR920 billion (USD12.9 billion) in overdue levies and interest. With MNOs in India required to pay the regulator between 3% and 5% of their adjusted gross revenue in usage charges for frequencies, plus 8% of AGR (Adjusted Gross Revenue) as license fees, the DoT and cellcos have been at odds over the definition of AGR. While operators are said to have argued that AGR comprise just revenue accrued from core services, the DoT for its part has claimed it should include all revenue. In the wake of the court decision, India's third largest cellco by subscribers, Bharti Airtel, put out a statement noting: 'This decision has come at a time when the [telecoms] sector is facing severe financial stress and may further weaken the viability of the sector as a whole.' Meanwhile, the Reuters report also cites mobile market leader Vodafone Idea as arguing that the court's determination was damaging for India's telecom industry, with it saying: 'Today's order has huge impact on two private operators while most of the other impacted operators have exited the sector.'

(October 25, 2019) reuters.com

India's Cabinet has approved a revival package for the country's two ailing state-owned telcos – Bharat Sanchar Nigam Limited (BSNL) and Mahanagar Telephone Nigam Limited (MTNL) – which includes an INR150 million (USD2.1 billion) infusion via sovereign bonds, as well as a voluntary retirement scheme (VRS), the allocation of 4G spectrum and a merger of the two operators. The government has also agreed to an INR380 billion asset monetization scheme over a period of four years, while it was noted that LTE-suitable frequencies will be allocated administratively at 2016 prices. India's telecom minister Ravi Shankar Prasad was cited as saying of the matter: 'Neither BSNL and MTNL are being closed, nor being disinvested nor hived off by the third party, but the government wants to make them professional.' It is understood that MTNL, which operates in Delhi and Mumbai, will initially become a subsidiary of BSNL until such time as both of the companies are fully merged, with the minister specifically confirming: 'MTNL will act as a subsidiary of BSNL.'

(October 24, 2019) The Economic Times

Luxembourg

Government adviser Pierre Goerens has revealed in an interview with Luxemburger Wort that the country's 5G spectrum allocation will not be completed by the end of this year as originally planned, following higher-than-expected demand from potential candidates for frequencies in the 700MHz and 3.6GHz bands. Mr. Goerens confirmed an auction now looks the most likely method for awarding spectrum in 2020, especially as a 'beauty contest' process resulted in a legal dispute when previously used to award 3G spectrum in 2006.

(October 22, 2019) telegeography.com

Moldova

The National Regulatory Agency for Electronic Communications and Information Technology (Agentia Nationala pentru Reglementare in Comunicatii Electronice si Tehnologia Informatiei, ANRCETI) is planning to issue an operating license to Sheriff Corporation's InterDnestrCom (IDC), the sole provider of mobile services in the breakaway region of Transnistria (also known as Trans-Dniester. In a White Paper criticizing the plans, Orange Moldova and Moldcell revealed that an amendment to the Electronic Communications Act had been drafted to empower ANRCETI to reduce the area of coverage for the 15-year

licenses in the 800MHz band issued to Orange, Moldcell and Moldtelecom in November 2014, thus freeing spectrum in the band for IDC. Orange and Moldcell have objected to the plans, highlighting that a decision to extend a license to IDC will redefine their operating rights. The two operators said: 'Based on these licenses, the operators have built 4G networks that cover most of the territory and population of Transnistria, serving this territory and the adjacent areas, which include over one hundred thousand customers. The 800MHz frequency band is a strategic asset, as it allows the provision of broadband data services in the high-speed and low-cost extended territories.' According to them, if such a deal has to be enforced, 'this can only be achieved by an agreement between the government and Orange and Moldcell concluded on commercial principles, against an adequate compensation for both the investments already made and the incomes that they would have [made from] the exploitation of these frequencies.' (October 9, 2019) The Mold Street

Namibia

Deputy Minister of Information and Communication Technology Engel Nawatiseb has stated that the Namibian government aims to achieve 95% broadband coverage by 2024. Tabling a new broadband policy and implementation plan in the National Assembly, Mr. Nawatiseb explained the policy will provide incentives for further innovation and investment. 'High-speed internet access or broadband is critical to economic opportunities, job creation, education, and civic engagement. But there are too many parts of this country where broadband is unavailable in both urban and rural areas,' he stressed. The Broadband Policy, which defines broadband as a high-speed internet connection offering a minimum download speed of 2Mbps, will span 2019 to 2029 while the associated Implementation Action Plan covers the period 2019 to 2024. (October 15, 2019) New Era

The Executive Director of the Ministry of Information and Communications Technology, has revealed the government has initiated a review of the country's communications laws and ICT policies in order to address current deficiencies and align legislation with emerging trends in the sector. 'The Communications Act No. 8 of 2009 and ICT policies have over time become outdated and obsolete. As a result most ICT sub-sectors are experiencing legal hitches in implementing and enforcing some provisions in the Act or provisions in their respective legal instruments because the Act is not aligned with certain provisions in the sub-sector policies, regulations, and guidelines,' he said.

(October 11, 2019) News Ghana

The Netherlands

The Authority for Consumers and Markets (ACM) has proposed plans to create a network infrastructure sharing framework to counteract any potential for a digital divide. With the plans intended to be released before the next spectrum auction in 2020, the regulator is putting in the groundwork ahead of time to theoretically ease the investment burdens of 5G network infrastructure in the rural environments. Telcos generally don't like to be told how to spend their money, but the ACM is taking appropriate, proactive steps to prevent the digital divide which tends to emerge when telcos are left to their own devices. "We regularly receive questions about what is and what is not allowed with regard to infrastructure sharing," said Henk Don, an ACM board member. "Working together in this can bring many benefits to telecom companies, but this should not be at the expense of mutual competition. With the guidelines we want to offer clarity to the parties on the mobile market and thereby contribute to a smooth rollout of 5G." Although the 5G rollout in the Netherlands is progressing at a much slower rate than other countries in the bloc, the pondering approach is allowing bureaucrats to create the necessary regulatory and legislative landscape ahead of time. Other nations, the UK for example, seem to be taking a 'build now, regulate later' approach, which runs the risk of creating the digital divide as telcos chase profits and an overbuild situation in the highly urbanized areas. As with anything in life, it is much easier to plan to tackle a problem as opposed to fixing after it has emerged. As part of the 'slow and steady' approach to network deployment, coverage obligations will be placed on any future spectrum auctions. 98% of the Netherlands geographic area will have to be covered by a certain time, though more details will emerge over the coming months as the auctions close in. 98% might sound like a ludicrous objective, though the network sharing framework should aid this. These are just very top-line ideas which are being presented by the ACM here, though more details will be offered over the short-term. Ahead of 2020, plans are being ironed out for spectrum auctions for the 700 MHz, 1400 MHz and 2100 MHz 5G bands, while the valuable 3.5 GHz 5G auction should take place at the end of 2021 or beginning of 2022. The ACM has suggested the proposals will be in place to ahead of next year's auction. Network sharing frameworks are not exactly uncommon throughout the telco world, though many regulators err on the

side of caution in the pursuit of competition. The UK is considering such plans also, though these would only be in the regions which are seen as the most difficult to justify commercially. Generally, these not-spots have almost no coverage nowadays, usually home to an incredibly low population density or no-one at all. This might not be the most rapid of rollout plans, but the 'first' tag does not necessarily mean much, or it might not end up meaning much. Laying the necessary regulatory framework ahead of plans, instead of playing catch-up like some nations, might just be a more considered approach. That said, the Dutch Government will not want to fall too far behind. (October 21, 2019) telecoms.com

The telecoms regulator, the Authority for Consumers & Markets (ACM), has published a market study on fiber-optic broadband access network deployment, which identifies problems of rollout bottlenecks in urban and rural areas around the country. ACM's report noted that: 'several parties often announce [plans for deploying] fiber-optics at the same location. The double rollout of fiber-optics is usually not profitable as an addition to the existing copper and cable networks. Within the current system, parties can respond strategically to fiber-optic projects of competitors, which are thereby delayed or limited. These behaviors towards competing fiber-optic projects increase the uncertainties for fiber-optic investors. This can cause investors to drop out and therefore lead to fewer investments in the rollout of fiber in certain areas. The opportunities currently available for the large-scale installation of fiber-optics in the Netherlands are therefore not being optimally exploited.' ACM's report implies that national incumbent telco KPN uses tactics regarding smaller competitors which could delay the installation of fiber; such practices include KPN announcing it is deploying fiber in an area where a rival is also planning fiber installation, despite the incumbent not having finalized such plans, thereby 'scaring off' potential local investors. ACM suggested potential remedies to the fiber bottleneck issues, including:

- exploring opportunities for joint investments within the competition law framework at the request of the market parties involved
- municipalities, utilities companies and provinces coordinating and publicizing conditions they apply for the installation of fiber networks, thereby providing clarity to all parties, avoiding uncertainty among investors and accelerating the rollout process
- giving municipalities options to temporarily protect a 'first-mover' party, i.e. the company that initially proposes a plan to deploy fiber in an area.

ACM will discuss its recommendations with the Ministry of Economic Affairs as well as municipality authorities. KPN disagreed with ACM's conclusions in an initial response, highlighting that it seeks agreements with competitors who want to install fiber networks in the same areas as KPN. The telco also indicated that it intended to discuss the matter with ACM.

(October 23, 2019) nrc.nl

New Zealand

New Zealand's Commerce Commission has released its draft determination on how much 16 telecoms providers will each pay towards the government's NZD50 million (USD31.8 million) Telecommunications Development Levy (TDL) for the period covering 1 July 2018 to 30 June 2019. The government uses the annual levy to pay for telecommunications infrastructure and services which are not commercially viable, including the relay service for the deaf and hearing-impaired, broadband for rural areas, and improvements to the 111 emergency service. The levy, about 1% of telecoms services revenue, is paid by providers earning more than USD10 million per year for providing telecoms services, including internet, mobile, and data services. The draft determination provides that Spark, Vodafone, Chorus and 2degrees will collectively pay more than 90% of the total levy, while the growing uptake of fiber services means that the contributions made by Enable, Northpower and Ultrafast Fiber will significantly increase. (October 30, 2019) telegeography.com

Niger

The Council of Ministers has announced that Zamani Com has applied for the acquisition of all the shares of mobile network operator (MNO) Orange Niger. A draft order has also been issued for the transfer of Orange's 'global license' for the establishment and operation of public telecoms networks and services to Zamani Com, which is reportedly associated with businessmen Mohamed Rhissa Ali and Moctar Thiam. The discussions are ongoing with the buyer to settle debts owed to creditors and unpaid taxes. Earlier this year French telecoms firm Orange Group said it was considering all options for its Niger business and confirmed that a local court had appointed an expert to examine its situation and support its negotiations with creditors.

(October 22, 2019) Reuters

Nigeria

The Nigerian Communications Commission (NCC), has ordered with immediate effect the stop of the planned N4 charge for the Unstructured Supplementary Service Data (USSD), planned by telecoms operators. A document signed by the Director of Public Affairs, NCC, Dr. Henry Nkemadu, , which ordered the suspension, put telecoms subscribers on note on its decision following Federal Government's directive. NCC also put financial institutions on the note on its decision to suspend the plan. Meanwhile, while complying with the order, MTN insisted that it got the backing of the banks and the Board of Banks Chief Executive Officers (BOBCEOS) for the introduction of the service. According to MTN Company Secretary, Uto Ukpanah, in a statement, the telecoms firm approach every day with one primary objective, which is finding ways to make its customers' lives a little easier. "Customers are the reason we made transparency and simplicity central to the recent drawn-out engagements with the banks over USSD access charges and how they should be applied," Ukpanah stated. Ukpanah explained that following consultation with industry stakeholders, customer feedback and media reports related to the message notifying the company's customers of upcoming changes in the charging model for access to banking services via the USSD channel, "we wish to confirm that the new charging model has not gone into effect." According to her, the situation has made it necessary to restate that MTN Nigeria, in line with our company policy will always be transparent in its dealings with customers, the industry and relevant regulatory bodies. "The SMS notification to our customers is reflective of this commitment and was sent after formal requests received from individual banks as well as the Body of Bank CEOs to implement end-user billing – a billing methodology where the customer is directly charged USSD access fees irrespective of the service charges that the bank may subsequently apply to their bank account," she stated. Ukpanah noted that the banks have up-till now been on a corporate billing plan, where a corporate client, the provider of the service that is accessed through the USSD channel (in this case the bank), pays the access fees at a wholesale price. "We believe the costs associated with USSD banking services should be charged to the consumer only once – as with other USSD based services we provide, which we believe has been adequately provisioned for within existing Central Bank of Nigeria (CBN) guidelines," she stressed. She disclosed that it is in line with the National Financial Inclusion Strategy of the Federal Government that MTN resisted the calls for end-user billing, adding: "We relented only after exhausting avenues of engagement with the banks in pursuit of a model that enabled a single charge. We believe separate charges by the banks and telecoms companies are an unnecessary burden on the consumer especially the target group that the National Financial Inclusion Strategy is aimed at. "With this in mind, it is imperative for all parties to approach the table and engage constructively towards a solution, putting the consumer at the fore of all decisions. "The banks have been and still are our esteemed customers and valued partners. We look forward to collaborating with them and other stakeholders and will be glad to implement the decisions approved by our Regulators." Likewise, the Association of Licensed Telecoms Operators of Nigeria (ALTON), called for a meeting among the stakeholders involved in the matter. According to the Chairman of ALTON, Gbenga Adebayo, "In view of this, we call on the Nigerian Communications Commission, the Central Bank of Nigeria, financial and telecoms stakeholders to address this matter urgently for the benefit of consumers." (October 26, 2019) guardian.ng

The Nigerian Communications Commission (NCC) has notified mobile phone users that it has granted approval for the partial disconnection of Globacom (Glo) from the network of Airtel Nigeria, due to non-payment of interconnection charges. As a result, subscribers on the network of Glo will no longer be able to make calls to Airtel but will be able to continue to receive calls. In a statement, the NCC said: 'Globacom was notified of the application and was given opportunity to comment and state its case. The commission, having examined the application and circumstances surrounding the indebtedness determined that the affected operator does not have sufficient reason for non-payment of interconnect charges.' It added that the disconnection will continue until otherwise determined by the NCC. (October 22, 2019) telegeography.com

Norway

The National Communications Authority (Nkom) has begun consulting on proposed changes which would see the abolition of geographic telephone numbers in the country. In a press release regarding the matter, the regulator said it was suggesting that a common number series be used for fixed voice lines, noting that existing numbers would not be affected. According to the Nkom, the proposals are in part a response to upcoming changes to municipal and regional structures in Norway and, if confirmed, the revised numbering plan would come into force from 1 January 2020, at which date several county and municipal mergers are scheduled to come into force. Meanwhile, the watchdog also noted that since 2007 Norwegian fixed line subscribers have been able to take their landline with them when moving, even if to an entirely different region, arguing that this current system has therefore already served to dilute the geographic

affiliation of telephone numbers. With the Nkom having reportedly looked at various possibilities for changes to the country's numbering plans with local telecoms operators, it said several suggestions had been for the existing geographical number series to be combined into a common number series for fixed telephone services. Now, the regulator is seeking feedback on these plans – specifically from telecoms service providers, emergency service agencies and consumer authorities – by a deadline of 22 November 2019.
(October 16, 2019) telegeography.com

Panama

The National Public Services Authority (ASEP) signed Resolution AN No. 15710-Telco earlier this month, confirming its intention to distribute spectrum in the 1427MHz-1518MHz 'L-band' range for mobile use within the next two years. The move follows a consultation on the country's National Frequency Attribution Plan (Plan Nacional de Atribucion de Frecuencias, PNAF), which received feedback from mobile incumbents Digicel Panama, Telefonica Moviles Panama (Movistar), Cable & Wireless Panama and Claro Panama, as well as Millicom-backed ISP Cable Onda. Going forward, the watchdog seeks to clear the band within 24 months, although Digicel and Movistar have pushed for a briskier timeframe. While ASEP has stopped short of recommending the band for 5G use. A number of countries have earmarked the 1.5GHz band for fifth-generation mobile services, including the likes of France. (October 22, 2019) telegeography.com

Peru

The Private Investment Promotion Agency (ProInversion) has confirmed that the planned auction of 1750MHz-1780MHz/2150MHz-2180MHz (AWS-3) and 2300MHz-2330MHz spectrum will take place in the second quarter of 2020. The nationwide concessions will be valid for a 20-year period and support the deployment of 4G and 5G technology. The Ministry of Transport and Communications (Ministerio de Transportes y Comunicaciones, MTC) approved the spectrum auction in March this year and the government expects the process to generate around USD291 million in revenues. MTC is also considering using the 3.5GHz band for 5G use, having staged a consultation on its plans this summer. That band was utilized to stage the country's first 5G trial – staged by Entel and Huawei – in March this year, in San Isidro. In May 2019 Claro staged its own 5G trial, also with Huawei, using a temporary allocation of 3.6GHz spectrum; the test yielded download speeds of 3Gbps. Most recently, September 2019 saw Movistar join forces with Ericsson to test 5G technology in Trujillo.
(October 11, 2019) telegeography.com

Philippines

Deputy Speaker Mikee Romero has proposed House Bill 4886 which is designed to give Philippines industry watchdog the National Telecommunications Commission (NTC) more 'enforcement teeth' by updating the 24-year-old Republic Act 7925 (the Public Telecommunications Policy Act) where it comes to dealing with penalties and sanctions. The proposed House Bill seeks 'to improve compliance among public telecommunication entities and expand the NTC's control and capability as a regulator'. In a brief, Romero confirmed: 'My bill amends RA 7925 with a whole set of law-enforcement teeth because the 1995 law does not have penalty provisions and no means to hold erring entities and people liable for wrongdoing and not doing when they should have acted decisively.' Per the official, the new measures give the NTC the power to levy a fine of at least PHP1 million for every day a telco continues to breach requisite terms and conditions. Further, the amendment would allow the watchdog to order telcos to refund customers. 'The current framework is also inadequate mainly because it is based on a 20th-century orientation being applied to 21st-century situations. Urgent needs are also unaddressed, such as much better competition, consumer protection and industry regulation,' he pointed out, before adding that a review of the government's spectrum policy is also in order: 'We have only three major telecom players and dozens of bit players. We have a number of unused spectrum frequencies. The spectrum policy has been described by some experts as 'a mess.' 'The country has thousands of telecom dead spots nationwide,' Romero said. (October 10, 2019) Business Mirror

Poland

The Minister of Digitization Marek Zagorski says every household in the country will be passed by a fiber broadband network within the next three years. A report says the government will continue to subsidize rollouts in rural areas where it is unprofitable for telcos to finance their own network deployments. In some cases the rollout will be 100% financed by the state's Broadband Fund. The minister is quoted as saying: 'When we started our activities in the field of access to a fast fiber-optic network there were about seven million households in Poland [not covered by fiber networks]. As a result of the programs we have started, this number has fallen to 2.8 million. So it is quite real that within three years all residential buildings in our country will be connected to the modern network.' (October 22, 2019) Telko.in

The Office of Competition and Consumer Protection (Urzad Ochrony Konkurencji i Konsumentow, UOKiK) has called on the country's telcos and pay-TV providers to be more transparent about the pricing of their services. The watchdog has written to ten firms – Cyfrowy Polsat, ITI Neovision, Multimedia Polska, Netia, Orange, P4 (Play), Polkomtel (Plus), T-Mobile, UPC and Vectra – requesting that they change the way their prices are displayed in advertising or by salespeople. UOKiK wants consumers to be given a better indication of factors that can affect pricing such as penalties for failing to sign up for online billing, for late payment, or for not agreeing to accept marketing materials. The regulator has threatened operators with fines if they do not change their advertising practices by the end of this year. Tomasz Chrostny, vice president of UOKiK, commented: 'If telecommunications companies do not comply with our expectations within the time limit, we will decide to initiate proceedings. They can end with a penalty of up to 10% of annual turnover.' (October 9, 2019) telegeography.com

Portugal

Portugal's National Communications Authority (ANACOM) has intensified its 5G preparations and is now optimistic of staging a multi-band spectrum auction in 2020. As such, a draft decision has been approved designating the 700MHz band for 5G use, while the 3.6GHz range has also been earmarked for 5G access. In addition, the regulator has confirmed that surplus spectrum in the 900MHz, 1800MHz, 2100MHz and 2600MHz bands will also be distributed to the country's mobile operators. In a related development ANACOM has approved a draft decision relating to the 'reconfiguration and relocation' of the 3.4GHz-3.8GHz spectrum currently held by small cell wholesale provider Dense Air Portugal. The spectrum that the UK-owned company holds in Lisbon will be reduced from 168MHz to 100MHz and Dense Air will be relocated to the lower end of the band to allow for increased access for other companies. Dense Air has acknowledged that this change does not make its commercial operation unfeasible, and the watchdog says that the change 'will contribute to the overall spectral efficiency of the 5G national market'. (October 24, 2019) telegeography.com

Portuguese media regulator ANACOM has given some ground to telco Altice Portugal/Meo on the timetable for the clearance of the 700MHz spectrum for mobile applications in the country following a spat between the pair over the phasing of the project, but the outline of the change will remain the same. ANACOM said it had made its timetable "more flexible" to take Meo's concerns into account. However, it said the transfer of digital-terrestrial TV services from the spectrum would, as planned, begin in the south of the country and end with the change taking place in the Azores and Madeira, the source of the disagreement between the pair. ANACOM has asked Meo to conduct a pilot project on November 27 and to set out a detailed plan for the 240 transmitters that make up the Portuguese DTT network, indicating the date at which each transmitter will be changed. The outlining of the plan follows a dispute between Men and the regulator over the timing and phasing of the transition. Following a visit by Altice Portugal president Alexandre Fonseca to Madeira in September, where he was critical of the watchdog's approach to the transition and said that Portugal was in danger of falling behind other European countries in the rollout of 5G, ANACOM said that, at the time of its consultation on 5G last year, Altice had argued that the allocation of 700MHz spectrum should only take place after 2020, delaying the launch of 5G until 2022. The regulator rejected the criticism and said that it had set out a timetable in consultation with Altice technical staff. Altice is responsible for the Portuguese digital-terrestrial network that currently uses the 700MHz band.

(October 12, 2019) digitaltveurope.com

Romania

Romania's Minister of Communications, Transport and Infrastructure, Lucian Bode, has informed a parliamentary committee that the country's 5G spectrum auction will not proceed as planned in 2019. Romania's National Authority for Management and Regulation in Communications (ANCOM) had previously indicated that it expected 5G licenses in the 700MHz, 800MHz, 1500MHz, 2600MHz and 3400MHz-3800MHz frequency bands to be awarded by the end of 2019. However, the body's vice president, Eduard Lovin, recently warned that legislation to set frequency prices at an appropriate level was still required before the auction, which is expected to raise EUR500 million (USD560 million), could proceed. (October 31, 2019) Economica

The National Authority for Management and Regulation in Communications (ANCOM) has launched a new online map showing 2G, 3G and 4G coverage and signal strength across the country. The application, which can be viewed at www.aisemnal.ro, has been compiled using field measurements collected during the regulator's own monitoring campaign and enables users to view the network footprint of the four mobile operators in the Romanian market, namely Vodafone Romania, Orange Romania, Telekom Romania and RCS&DCS (Digi Mobil). Local news site cites Communications Minister Alexandru Petrescu as noting that there is a digital divide in rural areas, as 4G networks currently cover only 77% of the country, well below the European average of 92%. He expects the new digital platform will help attract EU infrastructure funding through the Connect Europe and Competitiveness Operational Programs. (October 24, 2019) mediafax.ro

The Ministry of Communications & Information Society (MCSI) has announced the completion of Lot 5 of the 'Ro-Net' project to extend broadband infrastructure in disadvantaged areas. Lot 5 is the second of seven sections to be completed following Lot 1 in May this year and includes a total of 96 locations in the counties of Dolj (30), Valcea (38), Mehedinti (26) and Gorj (2), consisting of 20,747 households and about 55,457 potential customers for internet, television and landline services. Once completed, the infrastructure is opened up to any operator wishing to provide services. Construction of the RON377.83 million (USD87.63 million) national 'Ro-Net' broadband network, which is co-financed by the European Regional Development Fund, began in August 2014 and was originally expected to be finished by the end of 2015. However, following a series of disputes and delays, work is now expected to be completed in late 2019. (October 14, 2019) telegeography.com

The Senate and a government commission have removed provisions from a draft government emergency ordinance issued in August that would have required customers buying a pre-paid SIM card to present their ID card from 1 January 2020, reports Profit.ro. The decision follows a warning from the ombudsman that there was no justification for rushing through such a requirement, which it believes would 'drastically limit' the right to privacy. (October 3, 2019) telegeography.com

Russia

Russia's Federal Antimonopoly Service (FAS) has opposed the planned allocation of 2.3GHz-2.4GHz frequencies in 83 regions to Rostelecom under the 'Digital Economy' national program, arguing that the spectrum should instead be put up for auction to raise 'billions of rubles'. Rostelecom intends to use the wireless broadband spectrum to connect schools, state bodies, territorial election commissions, medical facilities, fire and police stations, facilities of the Russian Guard and other locations, under a program to connect around 100,000 'socially significant' entities by the end of 2020. The State Commission for Radio Frequencies (SCRF) plans to issue the 2.3GHz-2.4GHz LTE spectrum for ten years to Rostelecom in 83 regions, while in Russian-occupied Crimea, a similar ten-year concession is earmarked for internet provider Miranda-Media. The FAS argues that the ten-year concession period is excessive as the government contract to connect socially significant facilities only runs to end-2020. The antitrust authority also deems the bandwidth allocation excessively wide. (October 18, 2019) ComNews

Russian Ministry of Communications has begun lowering its prices for 5G spectrum. A new draft methodology for 5G pricing has been introduced. It is expected that the starting price for one a lot of 200 MHz in the 25.25-27.5 GHz band will be reduced from RUB 2.3 billion to RUB 670 million. The draft document has been drawn up in preparation for an auction of the 25.25-27.5 GHz bands, which state radio frequencies commission SRFC is expected to announce in December. (October 11, 2019) Cnews.ru

The state-backed national telco Rostelecom's plan to up its stake in mobile operator Tele2 Russia from 45% to 100% has been approved by a decree signed by President Vladimir Putin. The decree accepts 'the proposal of the Government of the Russian Federation to increase the participation share of Rostelecom and its subsidiary Mobitel in the authorized capital of T2 RTK Holding [Tele2] to 100%.' The government approved a plan to raise Rostelecom's Tele2 stake in June this year. Russia's VTB bank is currently the second largest shareholder in Tele2 Russia with 27.5%, while Invintel

(backed by Alexei Mordashov) holds 22.0% and ABR Investments (part of Rossiya Bank) 5.5%. As previously reported, Rostelecom's Tele2 equity increase will involve issuing Rostelecom shares to existing Tele2 owners, although only VTB has been mentioned in this context so far, with the bank expecting to claim a Rostelecom stake of up to 17%. The presidential decree confirms that VTB will redeem an additional issue of Rostelecom ordinary shares, although the total volume of additional shares to be issued is not yet specified. The decree also ensures that the Russian Federation together with VTB and Vnesheconombank (current owner of a 3.95% Rostelecom stake) must retain control of more than 50% of Rostelecom's ordinary shares. Furthermore, VTB will be banned from selling Rostelecom shares for four years, while the government may still veto transactions on such shares after four years. Rostelecom will also be given pre-emptive rights to repurchase securities. The decree says that Rostelecom's Tele2 buyout and the issue of additional Rostelecom shares should be completed within six months. (October 8, 2019) TDaily

Singapore

The telecoms regulator, Infocomm Media Development Authority (IMDA) has revised its plans for the allocation of 5G-suitable spectrum, saying it now intends all four mobile network operators (MNOs) to roll out fifth-generation networks starting from next year, up from its original plan to have just two. In May 2019 IMDA called on interested telcos to submit detailed proposals on their 5G deployment plans, suggesting that by 2020 at least two networks would be rolled out in the city-state. At the time the regulator said it intended to assign 5G-suitable spectrum to 'two winning submissions' through a Call For Proposal (CFP) regulatory instrument, rather than conducting an auction of spectrum, with telcos' proposals assessed instead on the quality of their deployment schedules. Its CFP included a number of stipulations, including: 50% 5G network coverage by end-2022; wholesale MVNO 5G access; and specific financial capability requirements to support the rollout. IMDA also revealed its plans to allocate spectrum in the 3.5GHz, 26GHz and 28GHz bands for 5G in the initial tranche of spectrum allocation to telcos, saying it would be sufficient for at least two nationwide 5G networks. However, the regulator now wants all four of its carriers – Singtel, StarHub, M1 and TPG (Singapore) – to introduce 5G services, with half the city-state covered by a standalone network by 2022 to 'maintain competitiveness in developing technology'. As such, it now aims to select two network operators to deploy 5G using the 3.5GHz band, while the other two MNOs will be assigned additional bandwidth to upgrade their existing 4G LTE infrastructure to 5G. The plans suggest a reserve of SGD55 million (USD40 million) for each bandwidth allocation (for a standalone network), with a view to awarding the spectrum by the middle of 2020. The operators will also be given the millimeter wave (mmWave) spectrum in the 26GHz and 28GHz bands (free of any license fees), although an annual utilization fee of SGD1.232 million will apply for each operator. Meanwhile, operators of the two smaller 5G networks will only be given the mmWave spectrum (but will be subject to the same utilization fees). The spectrum licenses will have a minimum duration of 16 years, according to the regulator's presentation. Commenting, IMDA communications manager Mr. S Iswaran said the decision to opt for all four MNOs having 5G capability is driven by a need to 'secure Singapore's competitive edge', adding that he believes the pricing strategy is in the 'mid-range' of those in other countries.

(October 17, 2019) telegeography.com

Somalia

The National Communications Authority (NCA) has launched a consultation process for the country's first licensing regime for the ICT and telecoms sector. The draft Unified Licensing Framework (ULF) would allow the provision of multiple services through the introduction of service and technology-neutral licenses that would promote innovation and competition. The move is aimed at bringing an end to uncertainties in one of the most developed sectors of the Somalian economy, as the lack of a formal licensing system has created disorder in the telecoms market and hindered further investment. Three types of permits exist under the new ULF, namely Communications Infrastructure Provider License (CIP), Application and Services Provider License (ASP), and Communications Infrastructure and Services Provider License (CISP). Stakeholders have been given until 5 December to submit comments on the ULF. (October 22, 2019) telegeography.com

Sweden

A change to Swedish law may make it possible for the country's military and security forces to veto telecoms equipment contracts if a particular supplier is deemed to pose a threat to national security. The move is thought to be aimed at Huawei of China which has been accused of producing equipment which could allow spying on behalf of the Chinese government. The new legislation is expected to be pushed through Parliament this autumn. A report cites Minister of Infrastructure Anders Ygeman as saying: 'Security in radio communications and mobile networks is becoming increasingly important. The amendment to the law makes it possible to deny a permit if a supplier poses a threat to Swedish security. It also provides the opportunity to revoke permits from operators.' He added: 'We simply cannot allow dangerous components. The government and I have seen a value in having the new legislation in place before the auction for new 5G licenses is held in early 2020.'

(October 15, 2019) SVT

The Post and Telecom Agency (PTS) says the country will need an additional SEK22 billion (USD2.2 billion) in investment if it is to meet a goal of having 100Mbps services available nationwide by 2025. The extra funding will have to come on top of what commercial operators have committed to spending, it says. It added that its figures are based on the deployment of a national fiber-optic network, and utilizing other technologies such as wireless could help to lower the total. In a statement PTS Director General Dan Sjoblom wrote: 'In the future, the involvement of commercial actors needs to be met by governmental efforts through broadband support in order for us to arrive [at the target]. In addition, we need to take a closer look at the extent to which wireless technology in the future can contribute to as many people as possible being able to access 100Mbps over the next few years.'

(October 3, 2019) telegeography.com

Tanzania

The Smart Telecom has shut down its mobile operations in Tanzania after submitting a business closure request to the Tanzania Communications Regulatory Authority (TCRA). The request for an immediate closure was submitted to the watchdog in March 2019, but the TCRA gave Smart a period of three months to enable customers to use up any outstanding credit. The mobile market's smallest player, Smart was a partnership between Industrial Promotion Services (IPS) Kenya (a division of the Aga Khan Fund for Economic Development) and Cyprus-based, Russian-owned Timeturns Holdings (49%). It launched its network in March 2014, utilizing the existing nationwide technology-neutral mobile license awarded in 2009 to CDMA operator Benson Informatics (BOL), and switched on a 4G LTE service in August 2015.

(October 9, 2019) The Citizen

Thailand

Thailand's telecoms regulator announced details of 5G spectrum auctions scheduled to begin in February 2020, with licenses to be issued across four bands and rollouts to start in March. The National Broadcasting and Telecommunications Commission (NBTC) said it will auction spectrum first in the 2600MHz and 26GHz bands, and later in the 700MHz and 1800MHz bands. A total of 190MHz of 2600MHz airwaves will be released in 10MHz blocks, while 2700MHz in the 26GHz band will be divided in 100MHz blocks, the newspaper said. The reserve price for these two bands will be announced at the end of October. Operators will be restricted to a maximum 100MHz in the 2600MHz band and 1200MHz in 26GHz. In mid-2020, three 5MHz blocks of 700MHz spectrum will be sold at a reserve price of THB17.58 billion ($581 million) per block. The 1800MHz spectrum will be split into seven 5MHz blocks, with a starting price of THB12.5 billion per license. NBTC plans to finalize the auction details next month and invite bidders by 20 December, The Nation wrote. This is NBTC's third attempt at holding 5G spectrum auctions. It first detailed plans to auction 2.6GHz spectrum in 2016, targeting 2017 to conduct the process, but the sale was subsequently pushed back with no alternative announced. In January, it outlined plans for an auction across the 6GHz, 28GHz and 2.6GHz bands, establishing a dedicated team to draft the conditions for this. Operators dtac, TOT and CAT Telecom later joined forces to launch 5G testbeds at two universities. (October 24, 2019) The Nation

The state-owned enterprise TOT has been banned from participating in all future projects commissioned by the National Broadcasting and Telecommunications Commission (NBTC), after the watchdog cancelled three of its contracts under the Universal Service Obligation (USO) Net project, citing contractual violations. TOT was awarded the contracts – for the provision of low-cost fixed broadband services in the North Zone 2 (worth THB2.1 billion [USD68.6 million]) and the North Eastern province (THB2.4 billion), and the provision of cellular services in the North Zone 1 (THB1.8 billion) – in an e-auction in 2017. Following an audit of the committee monitoring the USO Net project,

it was determined that TOT partially completed the mobile services contract, though the company used the wrong fiber-optic specification for the broadband network scheme, which the committee deemed as 'unacceptable'. Further, TOT failed to complete the construction of the agreed 371 buildings under the USO Net project, with only three finalized to-date. NBTC secretary-general Takorn Tantasith said: 'TOT failed to complete the tasks required under the ToR [terms of reference], even after one year from the due date … The financial penalty has reached THB800 million.' Mr. Takorn said that the NBTC had no choice but to terminate the contracts to prevent further harm to the public interest, especially in remote areas; the executive added that the NBTC will stage a new e-auction for the three contracts 'soon'. (October 7, 2019) The Bangkok Post

Uganda

The National Information Technology Authority of Uganda (NITA-U) has defended itself against accusations that it is wasting public funds with its rollout of a national backbone network. Recent press reports have accused officials at the state-backed body of corruption and of mismanaging the network deployment. A statement from NITA-U responded by saying: 'The originators of the false news are obviously determined on downplaying Uganda's progress in achieving widespread connectivity that has significantly lowered internet bandwidth costs to Ugandan individuals and organizations over the last ten years.' The body says that at the start of the project in 2008 the cost-per-Mbps was USD1,200 but that has now dropped to USD70-per-Mbps. According to a report from PML Daily, the agency adds that 3,000km of fiber-optic cable has already been deployed and a fourth phase of the rollout is underway.

(October 11, 2019) telegeography.com

Ukraine

The Antimonopoly Committee of Ukraine (AMCU) said in a statement that it has granted Azerbaijani mobile operator Bakcell permission to proceed with a potential deal to buy the country's second largest cellco Vodafone Ukraine, which is currently wholly owned by Mobile TeleSystems (MTS) of Russia, itself part of the Sistema group. MTS owns Vodafone Ukraine (registered as VF Ukraine) indirectly via a Netherlands-based holding company. The message on the AMCU site read: 'Today, the Antimonopoly Committee of Ukraine has given permission to Bakcell LLC (Baku, Azerbaijan) for the indirect purchase of shares of Preludium BV (Amsterdam, Netherlands) which [holds in] excess of 50% of votes in the management company. This will allow the Azerbaijani company to acquire indirect control over [the] Ukrainian mobile operator known under the brand Vodafone.' Earlier this month the AMCU disclosed an approach regarding a possible bid for VF Ukraine from Bakcell (part of Azerbaijan-based oil/construction/telecom/tech conglomerate Neqsol); MTS commented that it was studying possibilities for its international subsidiaries but no concrete deal was yet on the table. (October 25, 2019) telegeography.com

United Kingdom

The UK's Digital Secretary Nicky Morgan is reportedly supportive of a GBP530 million (USD680 million) proposal from the UK's mobile network operators (MNOs) for a shared rural network, with the potential that the government would invest GBP500 million into the project. In a press release regarding the matter, the Department for Digital, Culture, Media & Sport (DCMS) said that the proposed deal with EE, O2 UK, Three UK and Vodafone UK would see the quartet jointly invest in a network of new and existing phone masts that they would then all share, with this infrastructure providing coverage to 280,000 homes and businesses and 16,000km of roads. Commenting on the matter, Mrs. Morgan said: 'We are determined to make sure no part of the country is left behind when it comes to mobile connectivity. We are closing in on a deal with the mobile network operators so those living in rural areas will be able to get the fast and reliable mobile coverage they need and deserve. Brokering an agreement for mast sharing between networks alongside new investment in mobile infrastructure will mean people get good 4G signal no matter where they are or which provider they're with. But it is not yet a done deal and I want to see industry move quickly so we can reach a final agreement early next year.' (October 28, 2019) telegeography.com

The Minister for Digital & Broadband is writing to all UK planning authorities to say they cannot withhold permission without "legitimate grounds and evidence". In addition to Minister Matt Warman's correspondence, the government plans to do more to clarify messaging around 5G and bust health myths. The move follows several local authorities halting installation of masts after citizens have campaigns against siting 5G equipment at various locations on the grounds of health. Glastonbury's town council opposed the

introduction of 5G "until further information has been obtained on the health effects on residents" in June. A month later, nearby Frome's council refused to support the roll-out of 5G for similar reasons, followed by Totnes, and Brighton & Hove Council in response to campaigns by the Brighton and Hove Radiation Free group. A spokesperson from the Department for Culture, Media and Sport (DCMS) told SmartCitiesWorld that having already written to Newry, Mourne and Down in Northern Ireland, the Minister will write to all planning authorities "setting out the government's commitment to gigabit-capable networks such as 5G, the economic benefits of roll-out, the stringent safety guidelines, and also to make the key point that only objections with legitimate grounds and evidence should prevent planning permission from being granted." "There is no compelling evidence for any increased concern about 5G roll-out compared to Wi-Fi, 3G or 4G and there are well-established limits for radio equipment within which any new kit must operate. These limits are acknowledged by Public Health England in the UK and the World Health Organization," they added. Warman will also hold a cross-government meeting, including the Chief Scientific Adviser, Public Health England and regulator Ofcom, to make sure government messaging is clear, grounded in evidence and addresses people's concerns people. Warman commented: "Safety is always going to be paramount when we roll out new technologies and innovations, but there is currently no compelling evidence to back up concerns about 5G. "We want to support work that will bust health myths over 5G and provide evidence-based reassurance to the public. The benefits of 5G are huge – both to people's everyday lives and to the economy." The government has also launched a consultation on proposals to simplify planning rules to improve rural mobile coverage. The proposals include:

- Changing the permitted height of new masts with the aim of promoting mast-sharing and minimising the need to build more infrastructure;
- Allowing existing ground-based masts to be strengthened without prior approval to enable sites to be upgraded for 5G and mast-sharing;
- Deploying radio equipment cabinets on protected and unprotected land without prior approval, excluding sites of special scientific interest; and
- Allowing building-based masts nearer to roads to support 5G and increase mobile coverage.

5G health scares have taken hold elsewhere too. In April, plans to pilot 5G in Brussels were blocked due to concerns over radiation levels. Geneva followed in May. Some towns and cities in the US have banned 5G antennas from residential areas under the weight of calls from citizens. There have also been successful campaigns in some parts of Switzerland, which is the most advanced 5G market in Europe. Sunrise Communications' CTO, Elmar Grasser, talks about the effects of the protests in this exclusive interview.

(October 15, 2019) mobileeurope.co.uk

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