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Interview

H.E. Hamad Al Mansoori
Director General
TRA, UAE

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Advancing Intelligent Connectivity Across Sectors with 5G

It is time for smarter working; building better services, providing enhanced experiences, increasing productivity, and adding to quality of life. This means that, in the hyper-connected world of data, the attention has to be paid to the creation and flows of data, and getting the most suitable architecture for the Internet in place, which should include attention to cybersecurity and privacy needs of the owner of the data. This is the need for achieving intelligent connectivity.

Intelligent connectivity is essential to making smart cities a reality. To make smart cities a physical reality, however, both public and the private-sector stakeholders will have to collaborate and invest heavily in digital infrastructure that infuses together and profusely uses artificial intelligence, internet-of-things, and advancements in fifth-generation network technologies.

Across the sectors, 5G and its promises should be understood. As with any innovation in the previous generation of network technologies and industrial revolutions, 5G will spur new use cases across sectors and industries, and all this would require essential planning and tools to fulfill modern needs of security, to be able to make the most of opportunities that abound in the intelligent-connectivity realm. While 5G will offer a spectrum of new possibilities to the telecom industry, to adjacent sectors, to end-users, and to both governments and the private-sector, and thus has the potential to transform industries within both the public and private sector, it is important also that, as we plan ahead for 5G deployment this year, the security aspects are kept at the forefront at every stage of the 5G deployment process, which is about to start in the SAMENA region. IoT, which is expected to manifest itself through the presence of more than 75 billion devices over the next five or so years, cannot be understood and implemented in a consolidated and holistic manner without understanding the notion of intelligent connectivity. With advances in computing power and advanced

machine learning and data analytics tools, intelligent connectivity will have a mainstream impact across all sectors.

It is intelligent connectivity that harnesses IoT and artificial intelligence to add purposefulness to the state of being connected. The high-speed and low-latency transmissions of a 5G network, over which huge amount of data will be created, moved, and collected by sensors, drones, and a host of connected devices, and then the context-based real-time decision-making done on that data through intelligence situated at the edge or the core of the digital infrastructure, will enable a new genre of operational and creative capabilities in virtually every sector of the economy. This, regardless of how dauntingly complex it currently sounds, will potentially and truly alter how we have been operating as a society.

In the SAMENA region, there are some key sectors in which intelligent connectivity could make a noticeable impact: public safety and security, government platforms and citizen services, transportation and logistics, industrial operations, healthcare, agriculture and food management, and hospitality.

In this regard, SAMENA Council draws the attention of the decision-makers and digital communications industry stakeholders to think longer term about how the power of intelligent connectivity could be understood and leveraged to fulfill national ICT visions and achieve national policy objectives. Ubiquitous connectivity for the ever-growing population in the SAMENA region's urban and remote areas, and the management of traditional sector-specific challenges are key points of interest for the administration to delve into now, and SAMENA Council encourages the industry stakeholders to mutually assist in developing frameworks that may make it easier for large investments to take place, in order to physically realize the concept of intelligent connectivity, and to see where we need to steer it and ourselves. 🌱



Bocar A. BA
Chief Executive Officer & Board
Member
SAMENA Telecommunications
Council



H.E. Hamad Al Mansoori
 Director General
 TRA, UAE



Q. Please share your expert views on how the UAE's digital transformation efforts are progressing forward, and how far still the Emirates stands in being able to fulfill its digital implementation plans?

A. The UAE is ranked high at the global level in the Online Service Index published in the UN eGovernment Survey. It holds the first position at the level of Arab World and Middle East. This achievement reflects the feasibility and effectiveness of the plans and strategies set by the UAE Government to carry out digital transformation. We focused in the UAE on development of the digital infrastructure, in light of the directives of the wise leadership to create an environment fostering technical development and future solutions to achieve the goals of the National Agenda and UAE Vision 2021.

UAE's digital transformation is an irreplaceable route as our wise leadership made digital government a means to achieve society happiness by providing individuals and companies with easy competitive services.

The UAE adopted a long-term plan for digital transformation. That plan is based on the UAE Strategy for Future issued under directives of H. H. Sheikh Khalifa bin Zayed Al Nahyan, president of the UAE, and declared H. H. Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.

The ICT sector is adopted as one of the key pillars for comprehensive development in the UAE. The UAE Strategy for Future gave high priority to the ICT and smart systems as enablers to shape the future. We, in the Telecommunication Regulatory Authority (TRA) saves no effort to keep up with latest technical updates to ensure availability of the ICT infrastructure required for other development sectors.

We enhanced the principle of partnership between government and private entities to work with the team spirit and achieve to achieve a quantum leap at the level of smart government. We believe that private-public partnership is a key factor for success of our future strategies and creating proper environment for latest technologies including internet of things and artificial intelligence. We

launched several initiatives to develop our human resources according to the needs of the coming period, particularly in the field of big data, digital transformation, Internet of things and cyber security. We focused on innovation in the field of business and creating a flexible environment to support capacity building.

Our national achievements emphasises our ability to fulfil the digital transformation objectives we defined for ourselves. Today we are in the 6th position on the Online Service Index (OSI). We are implementing a definite plan to hold the 3rd position globally by 2020. The national OSI executive team is accelerating its work to achieve the objective of the UAE Vision 2021 to put the UAE in the 1st position on this index.

The UAE digital transformation is an irreplaceable route as our wise leadership made digital government a means to achieve society happiness by providing individuals and companies with easy competitive services.

Digital transformation became one of the future sustainability pillars, as it focuses on building a knowledge-based economy to enhance the UAE competitiveness and contribute to the economic diversity.

Q. Please describe the TRA's best practices and innovation in view of the UAE's readiness for 5G?

A. The TRA uses innovation and future shaping as key levers for its strategic plan. The TRA launched its 5G initiative in 2016 when 5G was still a distant dream. The objective of the initiative was to act as a facilitator among all stakeholders for an early preparation and launch of 5G in the UAE. The UAE Leadership focus on "Happiness" is translated by the TRA through enabling the best of ICT for the people of the UAE.

Q. What are the core 5G implementation impediments that still remains in the UAE and in the region, and how is the TRA progressing forward in being able to tackle them?

A. The 5G standards are being formalized. 3GPP Release 15 is there and work on

Release 16 is progressing. The WRC is scheduled in November 2019. The TRA 5G implementation roadmap is a phased program where we have objectives for each year. In 2018 the TRA allocated the required spectrum to the two Licensees for 5G. In 2019, the TRA will work with the Licensees for the sites deployment and commercial offering of the 5G. The TRA has a project for the technical challenges associated with the network synchronization and coordination. The TRA will also allocate the millimeter wave frequency ranges when agreed at WRC.

Q. How do you view the regional telecom operators' stances on the 5G, the pay-back periods in investment, and the common outlook among regulators and operators on the development of the future digital ecosystem?

A. The telecom operators have a responsibility towards the customers and their shareholders. While competition requires a continuous network upgrade, the financial outlay of investment is also important. The majority of the regional telecom operators have announced their 5G plans. The digital lifestyle with smart home, smart office, smart city, artificial intelligence, augmented reality will require a 5G platform due to the latency, flexibility and throughput support. Each operator has their own plan for 5G rollout. 5G is here. Now it is not a question of when but which use case will get more traction.

Q. For a regulator to successfully implement 5G and allow the market to reap the best fruit of investment, what high-level recommendations would the TRA-UAE like to make?

A. The 5G will change the traditional way of service offering. The operators have to collaborate with different stakeholders to customize digital solutions based on needs. The regulator has to pro-actively upgrade the regulatory framework to facilitate the 5G deployment. The 5G conducive regulatory areas are spectrum, numbering, network security, data privacy, site access, type approval, etc. The TRA is working on all these areas to make 5G a success.

The TRA launched its 5G initiative in 2016 when 5G was still a distant dream. The objective of the initiative was to act as a facilitator among all stakeholders for an early preparation and launch of 5G in the UAE.

Q. In view of digital economic transformation, especially since we are now operating in the age of 4th industrial revolution, how do you foresee the role of the Regulator and the Operator evolving?

A. The Fourth Industrial Revolution is characterized by a fusion of technologies that is blurring the lines between the physical, digital and biological spheres, collectively referred to as cyber-physical systems. This is the main driver for collaborative regulation where the traditionally distinct areas of regulation are now merging. One example of mobile money and mobile banking brought the ICT regulator and the financial regulator together to facilitate the new normal. In the coming days the ICT regulator will have to collaborate with the health regulator, drug regulator, trade regulator, competition regulator, aviation regulator, transport regulator. Collaborative regulation will be the new normal for the digital economy.

Q. What outcomes of the discussions from the Leaders' Summit 2019 vis-a-vis visualizing the impact of 5G in boosting ICT business and innovation are you expecting?

A. The Leaders' Summit provides a platform to share ideas, explore opportunities and discuss issues. Each stakeholder has an enriching experience. When all the experience is brought together and shared, innovative ideas for boosting the ICT sector are realized. The success of 5G will depend on its success in the whole region and not in few countries. 5G brings a number of exciting and innovative opportunities for businesses to grow. 5G will enhance productivity, reach, and happiness. 🌱

SAMENA COUNCIL ACTIVITY

SAMENA Council's Leaders' Summit 2019 to be Held with TRA-UAE's Patronage to Visualize Impact of 5G in Boosting ICT Business and Innovation



SAMENA Telecommunications Council is gearing up for its annual Leaders' Summit, to be held on April 18th, 2019, with the patronage of Telecommunication Regulatory Authority (TRA) of the United Arab Emirates. The one-day leaders-only event is the seminal congregation of leaders for materializing private and government partnerships; for fostering collaboration within the ICT industry of the region; and for discussing issues that have emerged since 5G deployment became a priority in the region, in alignment with national ICT visions. The Summit will congregate leaders and influencers from within the telecommunications industry across South Asia, the Middle East, North Africa, Asia, Europe and beyond. "Our

focus during Leaders' Summit 2019 is on highlighting the impact of 5G in boosting ICTs and enabling flexibility and capability of digital services. The areas which require specialized attention are Operators' need for improved spectrum allocation policies, and general regulator-level support for understanding future requirements and multiple dimensions in building the region's digital economy. One of the most anticipated ICT thought leadership and change-makers' events in the region, the Leaders' Summit 2019 will further empower SAMENA Telecommunications Council to be at the forefront of the campaign for building digital economies, unifying the telecom industry voice, helping optimize the collaboration

between operators and regulators and ICT industry service providers towards making a positive impact in the region's socio-economic development. It is SAMENA Council's privilege that the 2019 Leaders' Summit will be held with the patronage of the TRA-UAE," stated Bocar BA, CEO & Board Member of SAMENA Council. Commenting on the event, H.E Hamad Obaid Al Mansoori, the Director General of the UAE's TRA said: "We in the UAE rely on 5G to enter the age of the artificial intelligence and to apply the Smart Cities applications such as IoT. 5G will provide a flexible and adaptive intelligent platform to the mobile operators to connect everything and offer unique digital services. 5G will be the innovation

engine to empower the 4th industrial revolution. The TRA is creating a coherent environment to nourish and sustain this growth for the people of the UAE". The SAMENA Council's Leaders' Summit is an annual leadership event, encompassing private and government sector leaders'

gathering, various bi-lateral "closed-door" meetings, and panel discussions, held among stakeholders in a world-class setting. Leaders' Summit 2019 will build on past discussions, centered on enabling a true, regional digital economy. Areas to come under discussion include

Enabling Transition to "Inclusive 5G", Barriers to Achieving Economies of Scale in 5G Device Capabilities, Identification of Technology, Regulatory, and Business Challenges in Fifth-Generation Digital Communications, and "Industry 4.0" Use Cases in a 5G-enabled Digital Economy.



Dialogic Joins SAMENA Council's Membership to become an Active Player in SAMENA Region's Real-time Communications and IoT Market



SAMENA Council has announced that Dialogic, one of the Industry's leading IoT and cloud-optimized solutions provider for real-time communications media, applications, and infrastructure to service providers, enterprises, and developers around the globe, has joined its community of top-notch regional and global ICT industry players, which are enabling telecom operators to make the most of their infrastructure investments.

Mr. Bocar BA, CEO & Member of the Board of SAMENA Council, congratulating Dialogic on the decision to become a member of the Council, stated: "We warmly welcome Dialogic as a new partner-resource for our Telecom Operator members in their efforts toward creating new value differentiators in their end-users' digital communications experience. In Dialogic, SAMENA Council now has a member that understands

well the real-time communications and unified communications markets, and can add knowledge strength to understanding how IoT will alter and transform the communications market, as a whole. Companies that share the vision and spirit of Dialogic join SAMENA Council for multiple reasons, including for its platforms that allow stakeholders and innovative players to generate new business opportunities as well as interact with regional Operator leadership, while working toward addressing digital development matters that will define the future of the industry. Dialogic's decision to join SAMENA Council has arrived at a very strategic time, and we hope that with Dialogic team's active involvement with SAMENA Council, brand visibility and thought-leadership of Dialogic can be greatly enhanced in the region."

"Dialogic is excited to become a member of the SAMENA council," added Bill Crank, President and CEO of Dialogic. "Our membership provides a great opportunity for Dialogic to not only share our insights

on the transformations occurring in the industry and the region, but also learn from other members. We have a long history of innovation in telecommunications and strengthening or forming new relationships with operators, service providers, and other vendors in the council will only help to continue that tradition."

SAMENA Council believes while policies and co-operative approaches can help develop new methods and models of engagement; help frame future-friendly regulations and policies, it is also the involvement of diverse technology providers that contributes to better understanding which incentives are required by the Industry. The digital ecosystem's sustainability challenges and the need for making better use of digital technologies, therefore, demand that Operators and Technology Providers, such as Dialogic, collectively communicate on common issues and needs, while supporting SAMENA Council to conduct advocacy exercises and build communication bridges with regional governments.

About Dialogic

Dialogic is a leading cloud-optimized solutions provider for real-time communications media, applications, and infrastructure to service providers, enterprises, and developers around the globe. Based in Parsippany, NJ with offices worldwide, Dialogic works with 48 of the world's top 50 mobile operators, and nearly 1,000 application developers build and deploy on agile networks. Our global team of professional services experts is ready to help you with unparalleled support and consulting so you can get the most out of your network investment. 

MEMBERS NEWS



STC is the Most Important Partner to Build a Digital Base Economy: CIT Minister

While the Minister of CIT Abdullah Alswaha is confirming to journalists in Barcelona that STC is one of a most important KSA partners to build a digital base economy, The Global System Mobile Association (GSMA) announced STC as an official member of its dynamic NB-IoT working group. In a GSMA Barcelona meeting, STC was welcomed as an official member in this Global forum and standardization body. NB-IoT forum leads the industry and ecosystem to build end-end solutions based on NB-IOT. As part of its objectives, NB-IoT forum works towards facilitating the commercial launches of services based on NB-IoT and drives the introduction of related applications. As part of its continued activities, this forum will ensure interoperability of the future solutions across many industry verticals. This announcement places STC at the forefront of technology, and recognizes its pioneering technological leading role



across the globe. On the other hand, Minister of CIT Abdullah Alswaha visited STC booth and confirmed that is one of the most important KSA partner to build

a digital base economy, referring the key agreements that have been signed with giant technologies industry like Ericson Nokia, Huawei and KT.

STC Successfully Completes Indoor 5G Test, Paving the Way for Pioneering Indoor 5G Innovations and Inspiring Performance

Saudi Telecom Company (STC) and Huawei jointly announced the first trial of indoor 5G @3.5GHz in the Middle East and North Africa. This is the second indoor 5G test in the world. STC is the leading operator in Saudi Arabia, particularly in the 5G solution technology field. On February 20th, STC launched the region's first indoor

5G test via Huawei's 5G product - the first multi-band indoor 5G solution that supports both 5G NR (New Radio) and 4G LTE. Through the 5G indoor solution, STC will provide its customers with a faster and better user experience, and ensure that they enjoy the latest services, from 4K/8K video streaming to AR/VR video game

applications. The indoor 5G trial includes verification of 5G technologies and air interface DL peak throughput. During the testing in Dammam, STC used 100MHz in the 3.5GHz band on the 5G network, and achieved a peak user downlink throughput of 1.3 Gbps.

STC, UL Ink Pact to Set Up Testing Facility

Saudi Telecom Company (STC) and UL, a global safety science organization, on Monday, announced the signing of a memorandum of understanding (MoU) to establish a testing facility in the Kingdom. The Center of Excellence will be set up in Riyadh inside STC labs and will offer testing for various products across the

"Fiber to the Home" ecosystem. The facility will also provide testing services for fiber optic cabinets, fiber optic cables (indoor and outdoor), and mechanical civil items (ducts, plastic and metallic spacers, hand-hole and man-hole, covers and frames). "This collaboration will not only benefit STC and UL but would also further

support the growth of telecom sector of Saudi Arabia and other GCC countries," said Bader A. Allhieb, Vice President of operations at STC.

STC Group and KT to Cooperate for Developing High-Tech Business in Middle East

KT (Korea Telecom) announced the signing of a Memorandum of Understanding (MoU) with STC Group at Mobile World Congress 2019 in Barcelona on 26th to collaborate on new technology areas. As a leading telecommunication company in Korea, KT will cooperate with STC Group, the largest Saudi Arabian telecommunication company in middle east, in various business areas; fixed/mobile communication infrastructure enhancement, smart city, smart media, R&D and so on. Both Groups will generate and maximize the synergy effect by combining KT's state-of-the-art ICT technologies such as 5G network, GiGA Wire (High speed internet solution utilizing copper cables), GiGAeyes (Intelligent security solution), VR(Virtual Reality) and STC's Group business expertise and strong influence in MENA region. On the other hand, they will continuously seek other potential cooperation fields and strengthen their collaboration. Especially, GiGA Wire is KT's innovative broadband solution which offers internet speed of up to 1Gbps with a copper cable without deploying a separate

optic cable. It is regarded as an ideal solution to enhance network speed without damaging legacy buildings, thus KT and STC Group will closely work together to develop GiGA Wire business. KT's CEO Dr. Hwang said "We paved the way to lead 4th Industrial Revolution utilizing both groups' core competencies by establishing mutual cooperation with STC Group. KT will not only creating new markets and enhancing

customer satisfaction, but also leading Korea's 4th Industrial Revolution" In addition, STC Group CEO Eng. Nasser Al Nasser said "It will be a great opportunity for STC Group to collaborate and introduce KT's field proven solutions to Saudi Arabia. I am hoping our successful cooperation models could expand to STC's foreign subsidiaries and other MENA countries.



Saudi Telecom Company (STC) Announces the First Global Multi-Vendor Integration in Its 5G Network

STC completes the first global Multi-Vendor-Integration-Verification (MVIV) for its Huawei and Cisco core infrastructure with Ericsson and Nokia supplied 5G Radio Networks. This is the first of its kind achievement that will pave the way for STC to lead a diverse 5G deployment through joint innovation. STC continues to boost its 5G network capabilities and strives to provide best "Ultra High Speed & Low Latency" experience for its customers through the newly emerging 5G network. Following the 5G launch in 2018, STC and its global partners have continued to cooperate to enhance the 5G ecosystem in the Kingdom. These joint interoperability successes will ensure seamless interworking between

all elements of STC infrastructure and will deliver the best possible results. This critical achievement will speed up the introduction of the latest 5G technologies and nurture the growth of 5G services to fulfill ever-growing market expectations. As a result, this development will act as a solid step towards meeting total national digitization transformation. This milestone will enable flexibility and agility in our field deployment and ensures smoother launch of services. This is also viewed as a direct contribution in compliance with the latest 3GPP Release. Eng. Khaled I. Al Dharrab, Infrastructure Sector VP, STC, said: "5G network is developing at a very high rate. STC is a leading worldwide operator with a commitment to pioneer

the technological advancements and introduce new 5G services and use-cases. We have already put ourselves on the road to enable technology and shape the future of 5G services in the Kingdom. Our collaboration with our global suppliers will push forward the boundaries for our 5G ambitions. It will definitely lead to the rise of new class of services that will go far ahead in meeting our customers' high expectations. A well-integrated 5G network with full interoperability will deliver endless possibilities and opportunities for our deserving customers. This will also facilitate the road towards meeting KSA national 2030 Vision".

The Success of STC's Investment in Careem Aligns with Its Dare Strategy



STC Group CEO Nasser Al-Nasser confirmed that the success of STC's investment in Careem aligns with its Dare Strategy which

focus on growth and digital transformation, in line with the objectives of the Kingdom's Vision 2030. Saudi Telecom Company STC announces that Careem, in which the Company owns a direct stake of around 8.8%, has reached an agreement with Uber on 26/03/2019, for Uber to acquire Careem for a value of around USD 3.1 billion, payable as per the following: (i) around USD 1.4 billion in cash and (ii) around USD 1.7 billion in Uber's convertible notes, subject to adjustments (the "Transaction"). The Transaction is expected to be closed after obtaining the necessary regulatory approvals. The amount that the Company will be receiving from the Transaction will be around USD 274 million, partly in cash and partly in Uber's convertible notes, with the exact split depending on the final allocation at the closing of the Transaction. It is worth mentioning that the Company's investment in Careem was made in January 2017 for an amount of USD 100 million. In addition to the Company's direct investment in Careem, the Company has invested indirectly in Careem through two owned funds, which are: STC Ventures (STCV), which owns a 6.4% stake. Saudi Technology Ventures (STV), which owns a 2.9% stake. With regard to the period in which the positive financial impact on the Company's financials will occur, for both the direct and indirect investments, it will be determined once the Transaction is finalized and the final regulatory approvals obtained.



Batelco Group AGM Approves BD45.7 Million Cash Dividend

Batelco Group, the international Telecommunications Group with operations across 14 countries held its Annual General Meeting (AGM) for the twelve-months ended 31 December 2018 ("the year") at its Hamala headquarters, in the presence of Shareholders, Company Directors, Batelco management and members of the media. The Group's 39th AGM saw shareholders approve the recommendation of the Board of Directors for a full year cash dividend of BD45.7M (US\$121.2M), at a value of 27.5 fils per share, of which 10 fils per share was already paid during the third quarter of 2018 with the remaining 17.5 fils to be paid in the coming weeks. Speaking on the occasion, Batelco Chairman Shaikh Abdulla bin Khalifa Al Khalifa said: "Batelco is committed to delivering greater returns for its shareholders with its efforts leading to improved dividends." "We were delighted to announce 7% year over year growth to reach our highest revenues since Batelco's



inception of BD405.9M (US\$1,076.7) with the revenues positively bolstered by continued strong performance at Batelco Bahrain. EBITDA for 2018 increased by 15% over 2017 to reach BD142.8M (US\$378.8M)

with EDITDA margin of 35%." "We have a strong platform in place to build on in order to sustain long-term success for the Group and continue to deliver strong value for our shareholders," Shaikh Abdulla

said. Batelco Group CEO Ihab Hinnawi said that 2018 was a turnaround year for the Batelco Group supported by the ongoing rollout of the Group's transformation strategy and key investments in targeted services, leading to a significant increase in shareholder return. "We are very pleased to note that diversifying our revenues has paid back, with particular positive impact achieved by the acceleration of fibre implementation and data penetration. Our efforts resulted in significant improvement for Fixed Broadband, Datacom services and for digital services across our markets of operation." Mr. Hinnawi continued by saying that delivering unmatched customer experience is of the utmost importance to Batelco Group and that related programmes begun two years ago have ensured that Batelco maintained market leadership and realized improvements in all customer experience metrics in key markets. "We will continue throughout



the coming year to further enhance our relationship with customers and use business intelligence and data analytics as key drivers to create more customer centric operations," he added. Before concluding the meeting, Batelco Chairman Shaikh Abdulla extended his appreciation to management across the Group and

all employees for their efforts in turning Batelco around and increasing shareholder return significantly. "I also want to offer my appreciation to our shareholders for their support at all times; their confidence in our strategies is invaluable to us," Shaikh Abdulla stated.



du Drives UAE's Spirit of Innovation with Pioneering IoT and AI Competition

du, from Emirates Integrated Telecommunications Company (EITC), is leading the UAE's efforts to foster home-grown innovation and entrepreneurship with the launch of the first-ever IoT and AI Pioneers Competition. Giving youth an opportunity to spearhead the innovation initiatives established by HH Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE, and Ruler of Dubai, the event encourages contestants to tap into their creative thinking for the proliferation of ideas which will lead the UAE into the Fourth Industrial Revolution. Driven by U5GIG, which was launched by du in 2016, the IoT and AI Pioneers Competition has been created to address the leaderships' directive for a diversified economy boosted by innovative knowledge-based sectors. Throughout the competition, participants are encouraged to herald innovative ideas for the evolution of smart city, Artificial Intelligence (AI), and Internet of Things (IoT) advancements. Saleem AlBlooshi, Chief Technology Officer, EITC, said: "The growing motivations for knowledge and innovation-based initiatives are at the heart of Vision 2021's 'United in Knowledge' pillar. "At du, our mission is to nurture a spirit of innovation that makes this vision a reality. With the launch of U5GIG we have devised a platform to address national priorities, and by launching initiatives such as the IoT and AI Pioneers Competition, we are directly transforming the UAE's social and economic futures and progressing our intelligent networks," AlBlooshi added. The IoT and AI Pioneers competition is designed to inspire up-and-coming talents to play key roles in bringing HH Sheikh Mohammed Bin



Rashid Al Maktoum's initiative for science, technology, innovation and the UAE Future Accelerators program to life. Throughout the competition, participants are asked to adopt and implement

creative ideas that support innovation-relevant strategic objectives. They will also need to establish and maintain close, productive collaborations with academic institutions, industry and the community, while also directing state of the art technology to lead UAE communications technology innovation. The top winners

will receive valuable cash prizes and in addition to this, the winning idea of the overall competition will have the potential to be commercialized at a later date. U5GIG is a pioneering consortium of technical and academic organizations in the UAE, as well as global telecom vendors. Collectively, the consortium aims to pool their expertise to

define and develop a global 5G network and IoT equipment and services. U5GIG allows universities and technical organizations across the UAE to work together and participate in the development of the 5G ecosystem. It also exists for academia and industry players to test applications and technologies in a real-world setting.

du Makes First Live 5G Data Call

du - from Emirates Integrated Telecommunications Company (EITC) said it has conducted the first-ever Live 5G data call on its production 5G network while rolling-out 700 5G sites across the UAE, thus reaffirming its strong position in the region with non-standalone (NSA) 5G Access network launch. Moreover, du launched a native cloud unified 5G core network solution with capability to accommodate 5G NSA and 5G standalone (SA) evolutions. The announcement coincides with the Mobile World Congress 2019 held recently at Barcelona, Spain.

The deployment will allow du's customers to enjoy extreme broadband services. The 5G NSA deployment provides a wider bandwidth and lower latencies to support enhanced mobile broadband services such as virtual reality, augmented reality and 5G cloud gaming. The cloud-native and distributed 5G network will provide du's data network with the capability to implement a variety of 5G use cases, said the statement from du. The 5G deployment will enable du to provide seamless 5G data services across different verticals from individual to business customers

by providing data services over native distributed cloud across the UAE. Huawei and Nokia are du's strategic partners in the 5G roll-out, it added. IETC Chief Infrastructure Officer Saleem AlBlooshi said: "We are delighted to modernize and expand our network to latest state of the art 5G NSA including access network and native cloud 5G core network that supports NSA and SA." "We are proud to make this technology commercially available in the UAE," he added.



Etisalat Group's Chief Strategy and Governance Officer Highlights Impact of 5G Technologies on the Future of Media

Media 2.0'-the increasing impact of future technology on the media sector-was the focus of Khalifa Al Shamsi, Chief Strategy and Governance Officer, Etisalat Group at the two-day Arab Media Forum, the largest annual gathering of its kind in the Arab region. Etisalat was the official telecom partner at the event and in its 18th year of participation. Al Shamsi highlighted in his session that media plays an increasingly significant role in our lives as a trusted source for news and information, and beyond that also a source for entertainment. It is also a powerful communications platform for the society with the ability to influence people's opinions and perceptions therefore making a significant social impact at all levels. Media industry has undergone drastic transformation in recent years, and mainly due to the major technology advancements the world has witnessed. He went on to highlight the advances in technology and how it has facilitated the growth of



the media sector. The investments in 5G networks will play a significant role making a positive impact on the media. 5G has 'unlimited capabilities' with high speeds and ultra-low latency. Live feed

news coverage for reporters in the field specifically for breaking news and multi-location interviews for the TV industry were cited as examples for the future of media on the 5G network. The high speeds for

data download/upload speeds will benefit all journalists in particularly investigative reporters. These advanced capabilities will also be of immense benefits in media coverage of major cultural events, especially large-scale ones such as the upcoming Dubai Expo 2020. This will enhance the broadcasting capabilities for external coverage vehicles, create futuristic media platforms, and augment the services of content providers. High speeds and low latencies would also boost the quality of the media's interaction with its audiences. 5G technology will make hologram reporters a reality, still currently in experimentation stages; people in the future would go beyond than virtual reality being able to experience the news event through advanced immersive experiences technology. Currently globally there are 5

billion smart phone users with the number projected to surpass 7.2 billion within the coming 5 years or less. 5G data usage will comprise of 25 percent of the total global data transfer share. Video and immersive experiences will form the core of future 5G network capabilities giving users near life-like experiences with maximized levels of 2-way interactions. 5G networks will have a significant and positive outcome for the media and entertainment industry. There will be a transformation for fixed networks whereby globally all markets would move to a single telecom network that delivers 24/7 links to the rest of the world. This would elevate financial revenue, create new sources of income from advertising and content and have a wider outreach. In such a scenario, all segments of the society should be familiar with advanced

technologies which it makes important to have new regulations and legislations to be put in place to safeguard people's privacy as well as tackle cyber security and intellectual property. He concluded his talk by pointing out that it's imperative that we have media entities ready and willing to adopt these new technologies in order to ensure its leading regional and global status. At Arab Media Forum this year, there was a focus on the use of AI-driven 'Future Journalists', a first for the MENA region. Etisalat exclusively brought the first arab 'Robot Journalist' in a session on the first day of the forum named 'Aga A 20-50'. These advances in the ICT sector will cause disruptive advances in the making, broadcasting and usage of all media at a regional and global scale.

Etisalat and Telserv Announce Strategic Partnership

Etisalat and Telserv have announced a strategic partnership to further enhance portfolios of both parties to serve customers around the world. The agreement was signed by Ali Amiri, Group Chief Carrier & Wholesale Officer, Etisalat Group, and Marco Dunhof, Chief Strategy Officer of Telserv, on the sidelines of the Mobile World Congress in Barcelona. Through the partnership, Etisalat will be able to provide its enterprise customers with a full global coverage of direct inward dialing, two way voice (unified communications), toll-free and mobile numbers. Telserv, for its part, will enhance its portfolio in the Middle East and African region. This agreement provides customers of both organizations with a broader solution portfolio, based on connectivity between Etisalat's Tier-1 global network and the Telserv Global Voice Network (GVN) and all available number solutions. Through this strategic agreement, both organizations are able to address new markets, create and optimize business. Customers will benefit from this solution immediately and address challenges they were not able to do before. Commenting on the partnership, Ali Amiri, Group Chief Carrier & Wholesale Officer, Etisalat Group, said: "As one of the world's

fastest-growing telecom groups, Etisalat is focused on showing its commitment to excellence and innovation. We are committed to deliver a comprehensive portfolio of high quality wholesale services, extending the reach of mobile operators, carriers and ISPs globally. In partnership with Telserv, Etisalat will be able to service its enterprise customers even more with

cost effective solutions." Marco Dunhof, Chief Strategy Officer of Telserv, said: "We are very pleased with Etisalat as a strategic partner showing commitment for operational excellence and translating opportunities for customers. Etisalat has been a valuable organization for years and have proved to add value to the market in general, but also to its partners."



Etisalat's Partnership with 'Abu Dhabi Smart Solutions' Supports the Emirate's Digital Transformation

Etisalat signed a MoU (Memorandum of Understanding) with the Abu Dhabi Smart Solutions and Services Authority (ADSSSA) to boost their collaboration in the digital transformation of government services in Abu Dhabi. Etisalat will provide the technical knowledge and expertise to facilitate the ADSSSA's drive to digitise Abu Dhabi Government services, thus providing seamless and proactive customer experience to the Abu Dhabi community through the ADSSSA's platform 'TAMM'. The MoU was signed by Saeed Mohamed Al Mansouri, Executive Director of Joint Government Services, ADSSSA, Salvador Anglada, Group Chief Business Officer, Etisalat at Etisalat's headquarters in Abu Dhabi. The signing ceremony was also attended by H.E Dr. Rauda Al Saadi, Director General, ADSSSA, and Eng Saleh Abdulla Al Abdooli, Chief Executive Officer, Etisalat Group in addition to a number of senior executives from both entities. The agreement strengthens the existing cooperation between ADSSSA and Etisalat, and paves the way for joint innovative initiatives and strategic solutions to provide an array of innovative digital solutions, boosting the level of Abu Dhabi government's customer happiness and satisfaction. H.E Dr. Rauda Al Saadi, ADSSSA Director General said: "This agreement with Etisalat is a strong impetus to the digital transformation drive in the Emirate of Abu Dhabi, and will enhance its leading position in the field of government digital services. Through this strategic partnership, we will look at exploring new horizons and enable the latest digital technologies and smart solutions in the government sector, which is in line with the UAE leadership's vision to provide the community with the best and most innovative solutions and services, and enrich people's lives. "We look forward, through this collaboration with Etisalat, to enhance our strategic goals leveraging the best and most up-to-date technologies available today to our end-

users, and to provide sustainable best-in-class government services in Abu Dhabi emirate." Eng. Saleh Abdulla Al Abdooli, Group Chief Executive Officer of Etisalat, said: "We are honored to bring our network capabilities, teams and expertise together to serve and cater to the requirements of the different segments of UAE. The cooperation with ADSSSA will help in enhancing digital platforms, smart services and applications enriching people's lives in line with the vision of the UAE leadership to be a pioneer in all sectors. The partnership will provide futuristic solutions and services enabling connectivity with an advanced network and digital capabilities, which is also in line with Etisalat's vision of 'Driving the Digital Future to empower societies'." The MoU comes in the context of Etisalat's commitment to support the efforts of ADSSSA to harness the latest digital technologies to provide the next generation of government services. Etisalat provides a wide range of ICT solutions to the Abu Dhabi government services platform 'TAMM', which is a leading and futuristic model for government services in line with the Abu Dhabi Government Vision and the Abu Dhabi economic stimulus plan 'Ghadan 21', which means 'Tomorrow 21'.



Etisalat Expects 5G Smartphone Launch in June

United Arab Emirates (UAE)-based telco Etisalat says its customers will have access to the first 5G-capable smartphones by June this year. The firm, which has been

working with Huawei and Ericsson on its rollout, claims to have already deployed a 5G-enabled network and plans to have 600 5G base stations in service by the end of

this year. Rival UAE operator Du has said it will launch commercial 5G services towards the end of the year.



Oman Broadband, Inma Pen Cooperation Deal

Oman Academy for SMEs and SME Development Fund (Inma) penned a deal with Oman Broadband (OBB) on backing small and medium enterprises (SMEs). Under the agreement, Inma and OBB will

be establishing a Business Ecosystem within the telecom sector in a way to help SMEs growth in Oman. The purpose behind the agreement is stepping up the growth of sustainable development for SMEs.

Several organizations will be joining the "Business Ecosystem Initiative - Telecom Sector" with stake holders among them, including client contractors and sub-contractors.

Omantel Signs Agreement with Go2Invest

Omantel has signed a memorandum of understanding (MoU) with Go2Invest to offer high performance computing in collaboration with Oman Data Park, a press release said. Go2Invest is a Germany-based management consultancy and investment company for IT and telecom companies. Fadi Nasser, general manager of Omantel's ICT unit said, "Omantel reaffirms its commitment to bring in latest technologies and Industrial 4.0 services through successful partnerships, enabling its partners to achieve business growth and greater efficiency." "We are glad about our partnership with Go2Invest, which is a continuation for Omantel's efforts in setting the ground for 'Digital Oman' and the company's transformation strategy," he added. Nasser further said, "We are proud to lead the way in offering innovative ICT solutions. The high performance computing will be the first-of-its-kind in the sultanate and it will be offered exclusively for our corporate clients." He said there is an absolute need for high performance computing with growing reliance on big-data, as this type of computing is highly effective in fast data processing, which comes in useful for industries such as the financial, banking and oil and gas. Oliver Gustai, CEO of Go2Invest said, "We are happy about the signed partnership for high-performance computing with Omantel and are glad to have Omantel as a strong, reliable and innovative partner in the Middle East. Together, we are looking forward into a successful future with innovative solutions for our clients." Eng Maqbool al Wahaibi, CEO of Oman Data Park said, "As the first cloud and managed services provider in Oman, we are proud to continue leading the industry with innovative

solutions, and this collaboration with Go2Invest is another step forward in our successful journey. High performance computing infrastructure will be available as a service and can be leveraged for artificial intelligence, machine learning, big data analytics, deep learning and smart contracts."



Omantel Launches International Wholesale Entity

Omantel Wholesale, a leader in ultra-low latency networking, has launched an international wholesale company called Omantel International (OTI) to expand its global service offering. The public announcement took place during the Capacity Middle East 2019 event in Dubai, UAE. OTI is managing Omantel's international voice business and supports partners and customers with simple and efficient access to new and existing solutions. It was incorporated with a seamless migration of its customers in Q2 2018 and will see a growing number of voice agreements and other services added to its portfolio in the near future. "Omantel is growing and there is tremendous momentum behind our business. We have created this international entity to continue supporting our global customers with the best possible service and offerings that address their needs. The creation of OTI is a milestone for our business and demonstrates our commitment to offering global solutions that can adopt, evolve and

proactively shape our customers' demand, and furnish them with differentiated experience" said Baha Allawati, general manager of Carrier and Roaming Services of Omantel. "I'm extremely proud of our team. They have been exceptional in delivering the strategy and execution in such a short pace of time. OTI is phased to cater for international voice services while other services would potentially be also incorporated in the near future. " Omantel has investments in 20 subsea cable systems with landings in more than 120 locations around the world. Capitalizing on Oman's unique geographic position enables Omantel to offer ultra-low latency networking (ULTN) to various communications hubs in the Middle East, Asia, Africa and Europe. ULTN also enables innovation in applications and services and catalyze the foundation for Digital Transformation globally. Allawati added, "We anticipate 2019 as a transformational year for our business as we expand our international offering beyond the traditional

norm. Our partners and customers benefit from Oman's unique geographic location combined with strategic subsea cable investments across the globe to experience new levels of reliability, and performance, while addressing their specific needs and reach further. "OTI is also in the final stages of expanding its state-of-the-art systems in redundant geographical locations to assure its commitment towards its partners, further excel the quality of service of its offering, cater for the rapidly growing demand as well as offering diversified portfolio of services on mobile, data and international capacity." Omantel offers direct access to more than 50 countries in Europe, Asia, Africa, the Middle East and North America while connect and optimise its partners' applications and services. Its suite of solutions enables local and global carriers, cloud and content providers and enterprises customers to deliver exceptional Quality of Service and Experience to end users in both developing and developed markets.

Omantel Confirms Its Network Is Ready for 5G

Oman Telecommunications Company (Omantel), the Sultanate's incumbent telecoms operator, has revealed that its network is ready for the launch of 5G services, although consumers will have to wait for compatible handsets to become commercially available before they can benefit from the technology. 'We are ready from the network perspective, but individual

mobile phones are not. For example, if you go to some of the areas, you may find 5G appearing as a network, but you will not be able to pick it up from your mobile as it does not yet support this feature,' Times of Oman quotes Ali Al Hashmi, Omantel's Senior Manager of Network Design, as saying. In November 2017 Omantel and Ericsson conducted a live 5G showcase

in a real-world environment, including tests on speed, mobility and latency. The 5G showcase, which used advanced 5G features such as beamforming and beam tracking, was the first in a series of trials that Omantel and Ericsson agreed to conduct to prepare the network for the 5G evolution.

Omantel and Ericsson Honor Winners in '5G Use Cases' Competition

After a year-long competition between engineering students at higher education organizations across the Sultanate, Omantel and Ericsson have announced on Tuesday the top three winners of their '5G Use Cases' initiative. The ceremony, which took place at OCEC on the sidelines of COMEX 2019, was held under the patronage of HE Dr. Ahmed bin Mohammed Al-Futaisi, Minister of Transport and Communications, with the presence of high rank officials at the public and private sectors. HE Al-Futaisi saluted Omantel and other public and private entities that actively support digital transformation in Oman, "The most interesting part of the '5G Use Cases' competition is that it targets youth and engages them in Industry 4.0 that relies heavily on 5G technology." he noted. HE further stressed on the importance of 5G, saying that it has the potential to significantly develop the national economy by increasing productivity, in addition to supporting new lifestyles and work patterns. Dr. Hamad Al Rawahi, Executive President of TRA, has praised the initiative, "Such competitions are truly useful in helping students to expand their horizons in technology and encouraging them to be part of the 5G development by brainstorming new ideas with a focus on local market needs." He said. Adding that the initiative increases awareness on 5G and push towards more researches in this new technology. Talal Al Mamari, CEO of Omantel, said "Investing in 5G is a cornerstone for Omantel as with this technology we prepare the ground for the rapid development of many services and digital solutions in the Sultanate. We strive to offer our customers latest innovations, and have been successful in building our ecosystem achieving 5G



readiness." "5G Use Case is one of the significant initiatives that we have carried out in the past two years, and it comes in line with our framework to engage the public in what we do. Additionally, we want to increase awareness on 5G before the commercial launch, as this technology is vital for smart cities, artificial intelligence, big data, self-driving vehicles and many more." He added. Dr. Abdullah Al Balushi, Country Manager of Ericsson Oman, said "Through '5G Use Case' competition, we were able to engage students with industry 4.0 technologies, and their contributions revolved around smart cities, IoT, and other areas that support digital transformation. As an international company with long expertise in technology, we will work hand in hand with Omantel to train the top winners, and the first place winners will receive a one-week training at Ericsson's Research & Development Centre in Stockholm." A 'Drone' project by Dhofar University students, Salim Al Mashani, Adnan Al

Jahfali and Salim bin Ahmed, bagged the first place in the competition. The project is about a drone that can be used to collect information on affected areas during crisis, making emergency response much faster and hence, eliminating the associated risks. The drone can also be used to carry out relief operations when infrastructure is badly hit or destroyed. The second place was won by 'Street Monitor' project, for SQU students Mayadah Al Azri, Ghada Al Rasbi and Manar Al sharji. The project revolves around monitoring traffic congestion by using artificial intelligence, and directing drivers to alternative ways accordingly. The third place was secured by SQU students for their 'Garbage Level Indicator', the students are Asim Al Mazroui, Mohammed Al Fori and Yousuf Al Mandhari. The project is about a system that manages waste disposal by cleaners, by directing them on which areas to go based on waste levels.

ITA Ties Up with Omantel to Implement Smart City Pilot Project at KOM

The Information Technology Authority (ITA) and Oman Telecommunications Company (Omantel) signed recently a Memorandum of Understanding (MoU) to implement Smart City pilot project at Knowledge Oasis Muscat (KOM). According to the pact the company will provide the required communication and support services to benefit from the applications of smart city, Internet of Things, cloud computing services and big data within the Smart City pilot project currently implemented in KOM by ITA in cooperation with the public Establishment for Industrial Estates (PEIE. The MoU was signed by Dr Salim Bin Sultan Al Ruzaiqi, CEO of ITA and Talal Bin Said Al Mamari, CEO of Omantel. Alruzaqi said, "We thank Omantel for its cooperation and support for the Smart City pilot project at KOM, which we are working on in cooperation with PEIE. Through this pilot project we seek to leverage the potential offered by the Internet of Things technologies and various smart systems to facilitate the management of KOM in a smart way to provide a number of convenient and swift services to employees working at KOM as well as handling the available resources efficiently such as energy consumption, parking and traffic management and other services." "We hope that this pilot project to be a mini-model for a smart city application, and can be exported and implemented in other entities and other industrial estates within the Sultanate. This experiment will be as reference for the smart city specifications and requirements that will be implemented in the future," he added. "We are pleased to have such partnerships between the public and private sectors to contribute to the digital community and to benefit from the latest technology in the ICT sector," said Talal Bin Said Al Mamari, CEO of Omantel. "This strategic partnership with ITA as the leader of e-Government



is a complement to the government's efforts in embracing the 4th industrial revolution technologies, including smart cities, Internet of things, and artificial intelligence etc... through the adoption of digital lifestyles associated with the smart city in order to achieve a comprehensive vision for the digital society," he added. We have had successful technological partnerships with the Ministry of Tourism, the Ministry of Heritage and Culture and other public and private entities in the field of using ICT the thing which will impact the society as a whole. He added that Omantel and Al Mouj Muscat partnership in Smart Cities field is one of the existing partnerships to achieve the Smart City vision in the Sultanate.



Sudatel Telecom Group Brings Sudanese Start-Ups to 2019 MWC Barcelona

Sudatel Telecom Group had a successful participation at Mobile World Congress in Barcelona for the third consecutive year which took place 25-28 February 2019. MWC Barcelona is the largest mobile event in the world, bringing together 107,000 decision-makers who will be discussing the latest innovations and leading-edge technology. As well as demonstrating its own capabilities and discussing its plans for 2019, Sudatel brought to the show three companies chosen from its Spark Initiative, a program that is supporting innovative ICT-focused Sudanese start-ups. The three companies are all innovative enterprise software-focused companies delivering services that solve specific problems faced by businesses in Sudan. They have scalable business models with the poten-

tial to expand outside Sudan. Participating at MWC provides all three companies – as well as Sudatel - with a platform to demonstrate their capabilities, achievements and corporate strategic direction to potential partners, suppliers and customers around the globe. The companies were chosen by a committee of experienced business people in Sudan after the opportunity was publicized across Sudan. The three start-up companies are:

Yazan Solutions <http://www.yazansolutions.com/>, a GIS & IT solutions company that believes that digitalization is the present and future of business. Its mission is to be among the leaders of the GEO Solutions in the MENA region and its target customers are in the FMCG, Banking, Telecom, Courier and E-commerce industries;

Xerus Instruments, www.xerus.in provides a mobile app that enables Mobile Network Operators to test voice quality and video streaming, both indoors and outdoors, to improve the quality of experience for their customers without the need for highly paid field engineers and sophisticated test equipment;

Maglag.com, provides a website and mobile app that enable quality construction materials and maintenance from a variety of vendors to be sourced, bought and shipped at very competitive prices.

Tarig Hamza Zain El Abdein, CEO of Sudatel Telecom Group, said "They are all promising companies that have spotted gaps in the market – both within and outside Sudan.



Telecom Egypt and Nokia Ink MoU to Introduce a 5G Network and Test Use Cases

Telecom Egypt (TE) has signed a Memorandum of Understanding (MoU) with Finnish vendor Nokia to introduce a 5G network and test use cases. The collaboration between the two companies will focus on '5G deployment as well as

the evaluation of appropriate use cases of the 5G technology in the Egyptian market'. Commenting on the matter, Adel Hamed, TE's Managing Director & CEO, said: 'We are delighted to sign this MoU with our strategic partner Nokia which

paves the way for the development of 5G use cases in Egypt. This MoU marks a new chapter of the partnership between the two companies as it will allow our company to support the realisation of the digital transformation strategy in Egypt.'

Microsoft Collaborates with Telecom Egypt to Announce Its First Cloud Network in Egypt

During MWC Barcelona 2019, Microsoft Corp. and Telecom Egypt announced their collaboration to extend Microsoft's cloud network to Egypt. Telecom Egypt will provide low-latency connectivity into and across Egypt to help enhance performance and increase reliability for customers of Microsoft services. The collaboration will increase Microsoft's reach to the large Egyptian market in addition to improving connectivity across North Africa and the Middle East. Microsoft's global network is one of the largest and most innovative in the world. It connects Microsoft's cloud infrastructure of more than 100 datacenters, 135 edge node locations, and more than 100,000 miles of fiber and undersea cable systems to deliver Microsoft services to customers. The new point of presence in Egypt will benefit from a direct connection to Microsoft's global infrastructure to enhance the delivery of numerous services for customers. Microsoft's network investment will increase capacity and use the latest in network optimization for the delivery of Microsoft services in Egypt. The signing of the agreement was witnessed by Dr. Amr Talaat, Minister of Communications and Information Technology of Egypt, who said: "Egypt is moving towards achieving a promising digital transformation strategy to build a strong economy. The Ministry's commitment to the development of the ICT industry in the country is in line with the Egypt Sustainable Development strategy 2030. The Ministry appreciates partnerships that empower local institutions and drive business development. It is important to take full advantage of the unique geographical location of Egypt overlooking the Red Sea and the Mediterranean, which enables the country to become a regional digital hub." He added. Yousef Khalidi, corporate vice president, Azure Networking, Microsoft said: "Through our collaboration with Telecom Egypt, we are extending Microsoft's global network in Egypt and improving connectivity across North Africa and the Middle East. We are continuously investing to increase the size, speed, reliability and intelligence of Microsoft's global network to help enable the digital transformation of organizations and enterprises locally and abroad." Telecom Egypt's global network was built over the years through investments in consortiums and private international submarine cable systems. Its reach and position as an international hub with tens of terabits per



second lit capacity makes it the partner of choice for content providers. Egypt's distinctive geographic location on the Red and Mediterranean seas has enabled Telecom Egypt to connect more than 11 cable systems from the east and 13 from the west linked with the Red-Med Corridor consisting of 7 diversified highly reliable routes across Egypt. Adel Hamed, Telecom Egypt's Managing Director and Chief Executive Officer said: "We are pleased to partner with Microsoft as it represents one of the first steps toward our strategic digital transformation plan. Telecom Egypt's geographical position and its digital infrastructure will enable major cloud providers such as Microsoft to enhance their reach to consumers and enterprises in Egypt as well as reach other markets." Khaled Abdel Kader, general manager, Microsoft Egypt said: "Microsoft is committed to providing world-class cloud services to enable and accelerate the digital transformation of organizations, businesses and people in Egypt. Our collaboration with Telecom Egypt and Microsoft's investment in the country will further empower Egypt to achieve more through Microsoft services." The new enhanced network presence in Egypt will connect via Microsoft's global network to transatlantic and trans-Arabian paths, which will improve connectivity across North Africa and the Middle East, including enhancing connectivity to the new Microsoft cloud regions in development in South Africa and the United Arab Emirates.

Telecom Egypt Publishes Its Integrated Annual Report for 2018

Resuming an important practice to come closer to its goal of providing timely, accurate and comprehensive disclosure Telecom Egypt has published an all-

encompassing report about its operations in 2018 and its strategic directions. The report includes six main sections including a strategic review, governance,

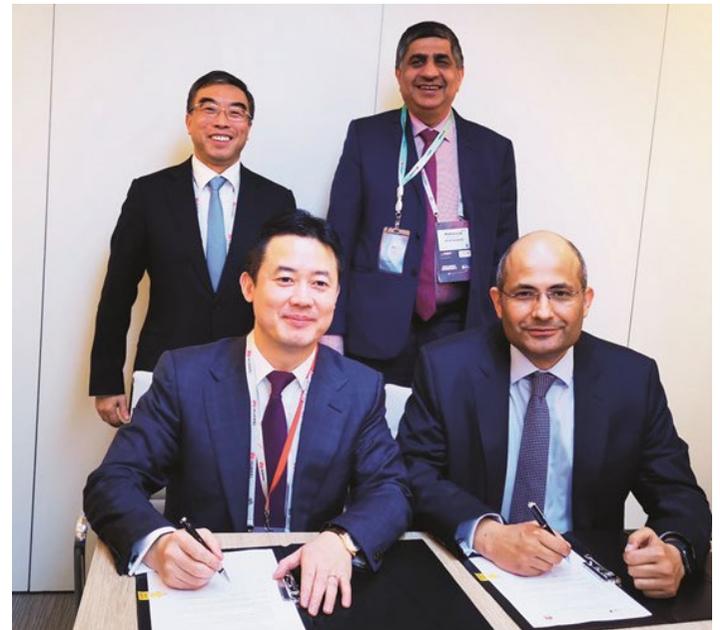
CSR and financial sections. The full report can be found here: <http://ir.te.eg/en/FinancialInformation/AnnualReports>



VIVA Announces Nationwide 5G Service with Huawei in Kuwait

VIVA, Kuwait's fastest-growing and most developed telecom operator, announced the establishment of a 5G Innovation Center, with the aim to explore, develop, and launch new 5G use cases in Kuwait by 2019. Currently VIVA is already in action to rollout a nationwide 5G network with over 1000 5G NR sites supported by a massive device ecosystem of more than 100K devices including 5G CPEs, setting the benchmark as one of the largest 5G commercial rollouts in the world up to date. The 5G innovation center comes to enforce VIVA's 5G business strategy execution and will open the door for new business models such as ultra-broadband, IoT, smart city services, and position VIVA as the undisputed leader in 5G era. On this occasion, Eng. Zarrar Khan, VIVA's CTO said: "Two months back, VIVA celebrated its 10th year anniversary, the growth we witnessed in the past represents an amazing success story. We provided best in class Telco services to our customers, invested in latest cutting edge technologies, and boosted Kuwait leadership in ICT era. Moving forward, we intend to position VIVA as first operator in the world to deliver true 5G NR experience, with the planned nationwide coverage, our clients will have access to 5G networks and experience new services. The establishment of the 5G innovation center will help us to drive digitalization across vertical sectors, Industries from telemedicine to smart cities to public safety will thrive with the support of 5G infrastructure. The networks will enable new revenue streams, enhance operational efficiency, reduce costs, and ultimately uplift the standard of living across Kuwait VIVA Kuwait chose Huawei as strategic partner to support its 5G rollout, leveraging Huawei's 5G leadership and E2E Ecosystem. Over the past 10 years, VIVA and Huawei collaborated to deliver successful 3G/4G services, this 5G move

reflect VIVA's confidence and trust in Huawei's capabilities. 5G is the next generation wireless network, enabling new 5G use cases to emerge and transform the way live, with its ultra-high capacity, services such as VR/AR, 4K/8K video live streaming will provide immersive experiences, critical communication use cases including driverless cars and drones will revolutionize transportation industry, sensors, machines and smart devices will be all connected bringing the smart city dream into reality. 5G will touch each and every aspect of our lives for the better.



Zain KSA Amends Tower Sale Terms

Zain Group's Saudi Arabia unit slightly revised the price of a tower sale and leaseback deal with investment company IHS Holding, upping the fee from SAR2.43 billion (\$648 million) originally announced

in November 2018 to SAR2.52 billion. No reason for the price change was given. Zain KSA said in a statement it will sell "its passive, physical infrastructure to IHS and will retain its intelligent software,

technology and intellectual property with respect to managing its network". Bader Al-Kharafi, Zain Group CEO reiterated the deal "is pioneering in many respects, not least in the way it allows us to reduce



debt and free up capital to invest in other areas of the business focused on customer satisfaction and service delivery". The remaining terms of the deal remain the same: a lease period of 15 years, with a five-year renewal option and the building of an additional 1,500 towers over the next six years. The agreement is subject to the approval of the

Kingdom's Communications and Information Technology Commission and financing authorities. In January Al-Kharafi hailed heavy infrastructure investments and organizational changes for preparing the company to commercialize 5G, though currency issues continued to take a bite out of its bottom-line in Q4 2018.



AT&T Joins Global Cyber Security Alliance Formed by Etisalat, Singtel, SoftBank and Telefónica

The Global Telco Security Alliance announced the addition of global telecommunications leader AT&T as an equal member in the group which was launched in April 2018 by Etisalat, Singtel, SoftBank and Telefónica. The Global Telco Security Alliance brings together leading telecommunications operators from around the world that offer enterprises comprehensive cybersecurity insights to help them address the growing threat of cyber-attacks and the evolving threat landscape. AT&T's addition represents a significant step up in resources and insights offered by the Alliance as a whole. AT&T has established extensive cybersecurity

capabilities and technologies. These were recently reinforced with the acquisition of AlienVault, which has enabled AT&T to accelerate delivering on its vision of enabling organizations of all sizes with effective cybersecurity solutions. The inclusion of AT&T heightens the Alliance's ability to share insights and best practices for customers globally by harnessing the expertise of more than 6,000 security experts and a global network of more than 28 Security Operations Centers. Combined, the members of the Alliance now cover more than 1.2 billion customers in more than 60 countries across Asia-Pacific, Europe, the Middle East and the Americas.

The Global Telco Security Alliance plans to expand its scope of activities and global footprint over time and is open to adding new members in the future. "We are thrilled to be the first telco in North America to join the alliance, and to do so as a founding member," said Barmak Meftah, President AT&T Cybersecurity. "Hackers have well established and organized communities that cooperate to produce cyber threats and it's time large network operators work together to help deliver disruptive innovations and enable our global customers to detect and respond to threats faster and protect their digital footprint."

AT&T CFO Backs Enterprise to Lead 5G Charge

AT&T has been snapping up low-band spectrum licenses in locations across the country, actions that could indicate the operator is working to flesh out its low-band holdings for a forthcoming 5G service. AT&T's latest spectrum deal is with C Spire, a regional wireless network operator based in Mississippi with around 1 million mobile customers. AT&T is requesting FCC approval to acquire 700MHz, PCS, and AWS-1 spectrum from C Spire in locations ranging from Mississippi to Alabama, Florida, Tennessee and Arkansas. The financial terms of that transaction were not disclosed in the operators' FCC filing for the transaction, and operators generally do not discuss the details, including the financial elements, of their spectrum strategies outside of Securities and Exchange Commission filings. "By acquiring the spectrum, AT&T will be able to increase its system capacity to enhance existing services, better accommodate AT&T's overall



growth, and facilitate the provision of additional products and services in the affected areas," AT&T wrote in its FCC application for the transaction with C Spire. "AT&T thus will be better able to meet the needs of new and existing subscribers by offering improved, more robust, and more advanced services." However, as noted by Brian Goemmer of spectrum tracking company Allnet Insights & Analytics, AT&T's transaction with C Spire is just the latest in a long line of transactions the company has made to gain new 700MHz B and C Band spectrum licenses in locations throughout South Dakota, Texas, Colorado and Utah. As Goemmer noted, AT&T in recent months has purchased 700MHz spectrum from the likes of NE Colorado Cellular, Central Texas Telephone Investments and FBS 700. Goemmer said the transactions generally have helped AT&T increase its channel size in the lower 700MHz band from 5x5MHz to 10x10MHz -- meaning, AT&T generally already owned some 700MHz licenses in those areas, but is moving to acquire more 700MHz

licenses. The more spectrum it owns, the more customers it can support and the faster speeds it can provide. "The proposed transaction with C Spire continues the same trend," Goemmer said. "Where AT&T is acquiring the 700MHz A band spectrum from C Spire they will have 15x15MHz channel size. This is likely part of AT&T's low-band 5G strategy, carrying LTE traffic on their FirstNet spectrum, with a 5G network deployed on their lower 700MHz spectrum." AT&T, of course, is racing to deploy 5G across a variety of spectrum bands in a growing number of cities, and has pledged to take 5G nationwide by early next year. Specifically, AT&T is deploying 5G on its 39GHz millimeter-wave spectrum licenses in just over a dozen cities, and has said it will use its "sub 6GHz" spectrum to deploy 5G nationwide. That makes sense considering low-band spectrum can cover wide geographic areas. However, AT&T officials have declined to say exactly what spectrum bands below 6GHz the operator might use to deploy 5G. Thus, AT&T's newfound appetite for 700MHz spectrum

could well indicate the operator will use 700MHz spectrum as part of its nationwide 5G push. (Some industry insiders recently speculated that AT&T would use its 850MHz spectrum for its 5G push. The operator could ultimately use several different bands for its 5G efforts.) AT&T isn't the only operator using low-band spectrum for 5G. T-Mobile too has said it will deploy 5G nationwide using its 600MHz spectrum holdings. AT&T's 5G push in 700MHz likely will sit outside of its efforts to deploy FirstNet's 700MHz spectrum. AT&T won a contract in 2017 to access 20MHz of FirstNet's 700MHz spectrum holdings, but that spectrum is primarily intended to be used for a nationwide LTE network for first-responders like police and firefighters. Of course, a 5G network won't generate revenues without devices that can connect to it. AT&T is currently selling the Netgear Nighthawk 5G Mobile Hotspot for its 39GHz 5G network, and has said it will soon offer several 5G capable smartphones to its lineup as well.

AT&T Launches New Cybersecurity Division, Joins Global Security Alliance

AT&T announced a new standalone security division, AT&T Cybersecurity, at this week's RSA Conference. It combines technology and threat intelligence from Alien Vault, which the operator acquired last year, and AT&T's security consulting and managed services. "Threat intelligence will continue to be a core of what we do," said Sanjay Ramnath, Assistant Vice President of Product Marketing for AT&T Cybersecurity, in an interview at RSA. "We already have a really strong history of collaborating with the community and making our intelligence data available to our customers and sharing with the larger community." When asked if he expects AT&T's move to spur other North American carriers to join the Global Telco Security Alliance, he said

"I hope so. If we can be an inspiration for the others to participate then we're doing a good job." Ramnath joined AT&T through the AlienVault purchase. Merging the two companies into a new AT&T division "has a very unique value proposition that can be articulated from three pillars," he said. "The first pillar is phenomenal threat intelligence." The Cybersecurity division combines this threat intelligence and network visibility under a single team called Alien Labs. And it will integrate and automate Alien Lab's threat intelligence into a security management platform, which is the new business unit's second pillar. "The second pillar is collaborative defense," Ramnath explained. "Cybersecurity and cybercrime is at a stage where no single vendor or

organization can fight crime on their own. Our approach is rather than build another point solution, let's bring existing solutions together and make them work in a way that the whole becomes greater than its parts." The third pillar is "security without seams," Ramnath said. Most breaches happen because of gaps in companies' security posture caused by disparate products, an explosion of data, and complex security management and operations. "The foundation is threat intelligence, and if you go up one level you have the SaaS platform that allows us to abstract, integrate, and automate," Ramnath said. "Up one level you have a very broad set of services. And the icing on the cake is our cybersecurity consulting process."

AT&T Agrees Spectrum Deal with C Spire

AT&T has submitted a filing with the Federal Communications Commission (FCC) in relation to the acquisition of a number of spectrum licenses from regional operator C Spire. The documentation -- as unearthed by Light Reading -- indicates

that AT&T seeks to acquire a total of 29 licenses covering locations such as Mississippi, Alabama and Florida. As per the filing, New Cingular Wireless PCS (an indirect wholly-owned subsidiary of AT&T Inc.) will buy the licenses from C Spire's

Cellular South Licenses affiliate. Included in the transaction are 14 2x6MHz 700MHz licenses, six 2x5MHz 1900MHz PCS licenses and nine 1700MHz AWS licenses (2x5MHz/2x10MHz).

AT&T Is Collecting Lots of 700MHz Spectrum Licenses, Possibly for 5G

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growing number of cities, and has pledged to take 5G nationwide by early next year. Specifically, AT&T is deploying 5G on its 39GHz millimeter-wave spectrum licenses in just over a dozen cities, and has said it will use its "sub 6GHz" spectrum to deploy 5G nationwide. That makes sense considering low-band spectrum can cover wide geographic areas. However, AT&T officials have declined to say exactly what spectrum bands below 6GHz the operator might use to deploy 5G. Thus, AT&T's newfound appetite for 700MHz spectrum could well indicate the operator will use 700MHz spectrum as part of its nationwide 5G push. (Some industry insiders recently speculated that AT&T would use its 850MHz spectrum for its 5G push. The operator could ultimately use several different bands for its 5G efforts.) AT&T isn't the only operator using low-band spectrum for 5G. T-Mobile too has said it will deploy 5G nationwide using its 600MHz spectrum holdings. AT&T's 5G push in 700MHz likely will sit outside of its efforts to deploy FirstNet's 700MHz spectrum. AT&T won a contract in 2017 to access 20MHz of FirstNet's 700MHz spectrum holdings, but that spectrum is primarily intended to be used for a nationwide LTE network for first-responders like police and firefighters. Of course, a 5G network won't generate revenues without devices that can connect to it. AT&T is currently selling the Netgear Nighthawk 5G Mobile Hotspot for its 39GHz 5G network, and has said it will soon offer several 5G capable smartphones to its lineup as well.



AT&T Reconfiguring 3G Spectrum Ahead of February 2022 Shutdown

US telecoms giant AT&T Mobility has confirmed that it is starting to reconfigure its 3G spectrum in the 850MHz and 1900MHz bands ahead of a planned shutdown of its 3G networks in February 2022. In a statement to Mobile World Live, a company spokesperson noted that the

cellco is in the process of 'redeploying spectrum currently used for 3G services to support mobile services on our 4G LTE and 5G networks based on market-by-market evaluations'. According to TeleGeography's GlobalComms Database, AT&T formally shut down its 2G service

on 1 January 2017. Meanwhile, Verizon Wireless – AT&T's chief mobile rival – stopped activating 3G CDMA-based handsets in July last year, and plans to switch off its 3G networks altogether at the end of 2019.



BT Expands Its Smart Delivery Locker Business to Reach 1000 Sites

BT's innovative supply chain business, Final Mile - which uses smart, secure delivery lockers to speed up the performance of field engineering teams - has achieved a major milestone by making the service available from 1,000 sites nationwide. Following a number of customer contract wins, the business has quadrupled its sales force and more than doubled the number of BT sites which support the service since its launch at the end of 2016. BT's Final Mile service is a nationwide network of secure lockers and boxes which are enabled by the Internet of Things (IoT). By positioning the lockers within the grounds of its 5,000 strategic sites around the country, BT can help organizations with large field engineering teams become more efficient, by reducing the distances engineers need to travel to collect essential equipment and spare parts. By using the lockers and boxes as intermediary stock locations, businesses can drive efficiencies throughout their supply chain, allowing them to serve their customers more rapidly, boosting customer satisfaction and loyalty. To deliver comprehensive levels of security, each unit is accessed via a unique code which is associated with specific users, drivers and parcels. And with each unit featuring IoT sensors and a secure, low power mobile connection, businesses benefit from a 'track and trace' service and gain full visibility of their inventory of stock at any given time. The service has helped BT to solve a key logistics challenge for one of its biggest customers

- the leading utilities company, EDF Energy. The company has been using the lockers and boxes to assist its nationwide rollout of smart meters. More than 1,000 of its engineers are trained to use the solution, allowing them to collect or drop off parts at 500 sites across the UK. Steve Maddison, General Manager, Final Mile, BT, said: "We know from our experiences with our own field service engineers, as well as our external customers, that fast, reliable delivery of parts and equipment is critical to customer service. BT's Final Mile service offers a flexible model which makes life easier for engineers, improves customer service and reduces costs. "We know Final Mile works because we've tested it with one of the largest field engineering workforces in the UK - our own. Final Mile is completely flexible. You can use our sites, put boxes and lockers

on your sites, or opt for a combination of both." BT has reduced the travel time of its engineers by as much as one and a half hours a day in some cases, with 97 per cent of its engineers able to collect spare parts from sites located within just 15 minutes from their home. By reducing the amount of time engineers spend on the road, Final Mile also helps organizations to reduce their fuel costs and total carbon emissions, creating greener, more sustainable businesses. BT has created a center of excellence within its Enterprise business which is dedicated to bringing innovative IoT solutions to market using its expertise in devices, connectivity and platforms. The Final Mile service is an example of how BT is rolling out IoT based services across the utilities, transport, logistics, retail and smart cities sectors.



More Accurate Timing to Help BT Improve Use of Spectrum

BT is using ADVA's Oscilloquartz synchronization technology to bring 4G coverage to previously underserved areas and begin the rollout of 5G services across the UK. Prior to this deployment, BT's timing network was based purely on frequency synchronization. The technology provides sub-micro-second accuracy and aims to enable BT to improve the use of its spectrum through the provision of stable and accurate phase and time-of-day

information. Neil McCrae, Chief Architect, BT Group, said, "Adding robust, highly accurate phase and time synchronization unleashes the full potential of our network. "Not only does it empower us to deliver the services our customers demand today but it's also the key to our 5G aspirations." BT's synchronization platform is deployed nationwide in 10 core time base sites, 106 metro time sites and close to 1,000 Tier 1 sites at the network edge. "Phase

synchronization has been a long-term development in international standards, and ADVA has actively contributed to that process," commented Mike Gilson, standards contributor and technical specialist, timing and synchronization, BT Group. He added, "By incorporating these capabilities in a flexible, high-performance solution, ADVA has created a synchronization network ready for the demands of 5G connectivity."

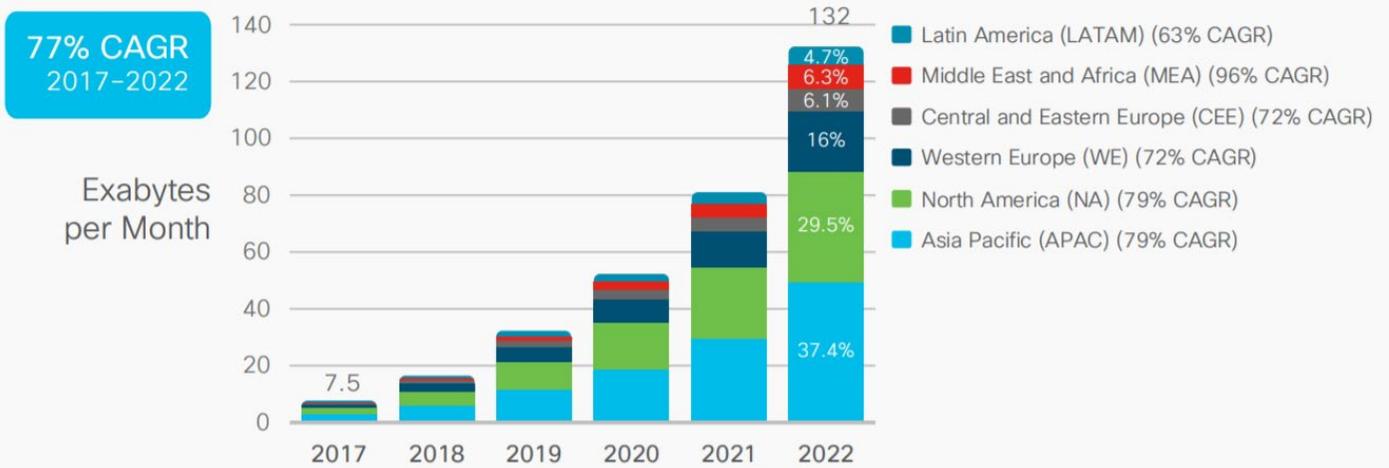


Cisco Predicts MEA as Region with Highest IP Traffic Growth in the Next Five Years

Cisco's Visual Networking Index (VNI) Forecast predicts 4.8 billion Internet users to be connected globally by 2022, out of which 549 million will be living in the Middle East and Africa. At its "Cisco Connect: Say Hello to the Future" event, Cisco celebrated 30 years of the World Wide Web by sharing insights from the VNI Forecast to predict trends and behaviors evolving in the digital landscape in the region and globally. Cisco's VNI Forecast predicts four key drivers of IP traffic growth in the MEA region by 2022: The number of people using the Internet will grow from 23% of the region's population in 2017 to 32%. Digitization features high on the national agendas of most of the region's countries. Cisco estimates that MEA will have approximately 549 million Internet users and account for the highest growth rate in IP traffic, with a 41% increase over 2017. Cisco predicts there will be approximately 2.5 billion devices connected to the network, equating to 1.4 networked devices per capita in MEA. Non-PC devices will drive 91% of regional Internet traffic by 2022. With projected average mobile network connection speeds to grow by as much as 28%, smartphones in particular are expected to make up 79%

of Internet traffic in MEA, with 1.2 trillion connected smartphones by 2022. Cisco anticipates the enhanced connectivity to create new possibilities for AI and Machine Learning across industries and in smart homes. As broadband connection speed is a key enabler for IP traffic growth, Cisco predicts the speeds will increase more than two-fold, from 2017 to 2022. Accordingly, it is expected that broadband speeds in MEA will increase from 7.8Mbps in 2017 to 20.2Mbps by 2022 – enabling businesses and individuals to operate with greater speed and efficiency. As this speed continues to increase, large downloads will go from taking hours to a matter of minutes and eventually, seconds. In terms of rich media, data-heavy files and videos are anticipated to make up 81% of MEA's IP traffic by 2022, up from 65% in 2017. The predicted 16% increase in media-rich Internet traffic can be partially attributed to the rapid growth of OOT film, television and music streaming services in MEA. As online gaming also continues to grow in popularity, Cisco predicts that the region will experience a five-fold increase in Internet gaming traffic from 2017, making up 1 percent of total IP traffic in MEA by 2022. Commenting on Cisco's VNI

Forecast and the changes predicted to affect MEA, David Meads, Vice President, Cisco Middle East and Africa said: "It is undeniable that the Internet is growing at an exponential rate. As governments continue to invest in infrastructure, a faster and stronger Internet opens the doors to unprecedented opportunities for individuals and industry alike. Digitization is a critical force for economic growth, so businesses must adopt a mindset that is proactive, rather than reactive. DDos attacks can represent up to 25% of a country's total Internet traffic while they are occurring. By implementing the appropriate cyberdefense mechanisms, organizations can protect themselves throughout the full attack continuum – before, during and after an attack. With nations such as the UAE championing innovation, the Internet has, and continues to change our lives in an infinite number of ways. Recognizing the changes that are affecting MEA, government, policymakers and service providers must continue to unite in their efforts to create an accessible Internet that is available to the masses, underpinned by a secure framework to aid sustainable growth."



Source: Cisco VNI Global IP Traffic Forecast, 2017-2022

Cisco and Telenor Partner on Cloud, Security and Open vRAN for 5G

Telenor Group's CEO, Sigve Brekke, and Cisco's CEO, Chuck Robbins signed a Joint Purpose Agreement 2.0 to expand their innovation partnership to include cybersecurity, cloud and the digital workplace. They will also explore Open Virtualized RAN (vRAN) solutions for 5G. The collaboration will be governed by a committee chaired by Ruza Sabanovic, CTO at Telenor Group, and Jonathan Davidson, SVP and GM, Service Provider Business, Cisco, with the aim of ensuring structured deliveries for shared goals. In early 2018, Cisco and Telenor Group initiated



their strategic partnership and have since collaborated on data analysis, IoT, Smart City, and security solutions. Sigve Brekke, President & CEO of Telenor Group, said, "We're in the midst of modernizing Telenor, preparing both ourselves and our customers for continued digitalization. Doing so, we're happy to enhance our collaboration with a key technology partner such as Cisco for solutions within cybersecurity, cloud and Open vRAN for 5G. "We're already working closely together on a number of innovative projects and are looking forward to a deeper engagement on some of the areas that matter most to our customers: fast, reliable, efficient and secure connectivity." Chuck Robbins, Chairman and CEO, Cisco, added, "Cisco is focused on innovating to help our customers evolve their networks to be more flexible and programmable as we look to 5G, and the billions of connections this new era will make possible. "Telenor Group shares our vision for the digital future, and we look forward to continuing to deliver on our mutual commitments to benefit both of our customers." Telenor-backed Working Group Two (WG2) has announced a cloud-managed mobile network with Cisco Ultra Packet Core on Amazon Web Services (AWS), running both control and user plane. The WG2 platform is designed to help mobile operators and enterprises to create and monetize services that control the network through a cloud-based API. Sabanovic said Telenor is proud to have incubated WG2 in the early phases and that as its first customer, Telenor can see how small and agile teams can achieve impressive output when using cloud infrastructure.

Colt Works With Cisco on 5G Backhaul

Colt Technology Services, a provider of high bandwidth connectivity, is working with Cisco for Colt to deliver 5G backhaul. Cisco is helping Colt to add greater flexibility to its Colt IQ Network for mobile service providers ahead of the advent of 5G. The Colt IQ Network connects more than 800 global data centers and thousands of fiber-connected buildings, which are all controlled by IQ Network software. Peter Coppens, VP of product for Colt, said in an interview with FierceTelecom that Colt has been working with Cisco and Ciena for a couple of years to add more capability to the Colt IQ Network. Colt has invested in Ciena equipment for optical upgrades, and it's investing in Cisco products and services for the packet side of the network. "We started with our historically dominant regions in Europe," said Coppens. "Then we rolled out to Asia, which is getting more important.

And then last summer we expanded into the U.S." Today Colt is highlighting its work with Cisco to deliver the use case of 5G backhaul. For this use case, Colt is deploying Cisco's programmable segment routing and Ethernet VPN (EVPN) based architecture. Segment routing is a new way of routing that makes the network more flexible and scalable. "You don't need to maintain a per-application state and per-flow state," said Coppens. "It helps us to build scalable networks." Cisco's EVPN solution is particularly important for Colt's 5G backhaul because it can replace the need to deploy fiber, in some cases. "The normal way to do backhaul is to go with dark fiber to a 4G antenna and then deliver connectivity to a mobile network operator," said Coppens. But by working with Cisco's EVPN, Ethernet can enable the sharing of that dark fiber. "Cell tower

owners were asking for dark fiber, but it's a dedicated circuit," said Coppens. "To keep the investment reasonable, more mobile network operators will want to share locations. And tower companies want to impose one infrastructure and set up as many MNOs on them as possible. Ethernet, instead of dark fiber, is simpler to share and still be able to give a class of service to different providers and different slices of the customers." Coppens added that with dark fiber it's "very hard to do multi-tenant, with Ethernet is much easier to do multi-tenant at the cell tower." "We have worked closely with Cisco to design a network architecture that is simple to operate, highly available, and capable of delivering the innovative network services that are required for 5G," said Coppens.



Emirates Data Clearing House Launches Bespoke Messaging Solutions at Mobile World Congress

Emirates Data Clearing House (EDCH), a subsidiary of Etisalat Services Holding, showcased its latest Application-to-Person (A2P) offerings at the Mobile World Congress in Barcelona. The two messaging products – Smart-Protect and E-Message – offer network security and revenue assurance to mobile network operators and diverse business messaging solutions to the enterprises spanning across various scales and verticals. Ahmed Al Yateem, Vice President Sales & Business Development, EDCH, said: “Our continuous efforts and commitment to innovation have enabled us to provide our Mobile Network Operator (MNO) partners with a complete and fully managed A2P messaging end-to-end solution to serve their needs. By incorporating our Smart Protect solution, MNOs are assured of full visibility and control over the A2P SMS traffic being terminated into their networks due to near real-time updates and security rules. “Our business messaging solution

E-Message will help MNOs capitalize on the enormous market potential by reaching out to targeted market segments with focused marketing campaigns. With our bespoke messaging solutions, corporates can monetize latent market opportunities and convert them into enduring sources of revenue.” Smart-Protect filters and monitors A2P traffic for network security and checks revenue leakage and enhances revenue. EDCH's state-of-the-art end-to-end managed messaging service supported by the constant monitoring and vigilance of a team of experts give it a competitive edge over others. Other benefits include bespoke solutions, zero risk, zero CAPEX and zero OPEX, flexible commercial models to suit clients' needs, and an easy end-to-end integration with zero network disruption. Our Business Messaging Solution E-Message helps enterprises capitalize on the enormous market potential by reaching out to a targeted market segment with focused

marketing campaigns. It also empowers all types of enterprises to automate their workflow with our unique messaging capabilities. With EDCH's bespoke messaging solutions, corporates can monetize latent market opportunities and convert them into enduring sources of revenue without spending on CAPEX, OPEX or management/maintenance of the solution. Established in 1994, EDCH is a trusted Value-Added Services (VAS) solutions provider of telecom operators and enterprises globally. It is the only data clearing house in the Middle East with clients spanning across the globe, empowering mobile operators and enterprises to enhance their revenues while reducing operational cost. It also offers comprehensive solutions such as data and financial clearing, revenue assurance, messaging, value added services, SIM and eSIM, among others.



Successful Mating of Eutelsat's KONNECT Satellite Payload with Its All-Electric Platform

Eutelsat Communications (Euronext Paris: ETL) announces the successful mating of the platform and payload of the KONNECT satellite, conducted this week at Thales Alenia Space's facilities in Cannes. This operation is a major step in the construction of the satellite, in preparation for its launch by the end of this year. KONNECT is a next-generation High Throughput satellite offering unprecedented operational flexibility. With a mass of 3.5 metric tons, this all-electric satellite, the first to use Thales Alenia Space's new Spacebus Neo platform, will provide 75 Gbps of capacity covering Western Europe and Africa. With capabilities for a large-scale service to address the demand on both continents, KONNECT is a major pillar of Eutelsat's strategy of return to growth, enabling the company to bolster its presence in the fast-growing broadband market. On a wider scale, this satellite program supports the Group's ambition to contribute to reducing the digital divide with a view to building a more inclusive digital society. By leveraging existing satellite resources, Eutelsat strives to achieve this ambition and sets the stage for the arrival of this satellite through the launch of new broadband services in these regions, such as in several African countries in the past months. Yohann Leroy, Deputy Chief Executive Officer and Chief Technical Officer

of Eutelsat, commented: “This mating operation represents a key step in this significant satellite program; one that will enable to deliver high-speed broadband services at affordable prices, with a view to complementing terrestrial networks in Western Europe but also in Africa where the drive to increase Internet penetration is a key priority.”

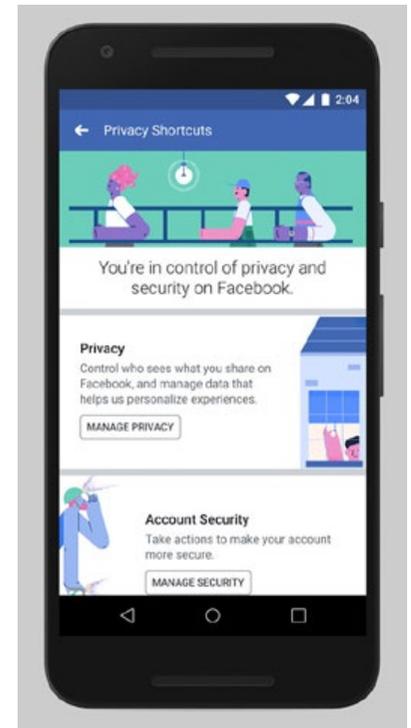




Facebook Chief Promises Privacy Overhaul

Facebook CEO Mark Zuckerberg laid out an ambitious plan to rebuild the social media network with a focus on privacy, as regulators in the US and Europe dig in to its data collection practices. In a lengthy post, Zuckerberg flagged encryption, reduced data permanence and secure data storage as key pillars of the new strategy. "I believe the future of communication will increasingly shift to private, encrypted services where people can be confident what they say to each other stays secure, and their messages and content won't stick around forever. This is the future I hope we will help bring about." In addition to previously announced plans to extend WhatsApp-style encryption to Messenger and Instagram, Zuckerberg outlined plans to add more avenues for private interactions with friends, groups and businesses. He also said Facebook is exploring a new model in which content will expire or be archived automatically after a set period of time: "People want to know that what they share won't come back to hurt them later", he wrote. The CEO added

it "makes sense" to collect less personal data from the outset and limit how long the company stores messaging metadata, which is used to inform spam and safety systems. Facebook will also continue to be careful about where it builds data centers, noting it will steer clear of countries with a track record of violating human rights including privacy and freedom of expression. Zuckerberg acknowledged the moves won't come without risks. For instance, he noted encryption can protect the privacy of people with ill intentions as well as good, and said Facebook has a responsibility to work with security forces to prevent illegal activity. To achieve this in an encrypted environment, he noted the company is working to halt malicious use of the platform "by detecting patterns of activity" among other approaches. While the decision to take care over the location of data centers may lead to Facebook being blocked in some countries, "that's a trade-off we're willing to make".



New Facebook Fiber Network May Offer Capacity to Other Network Operators

Facebook plans to build a fiber network that will start in Ashburn, VA and end in Columbus, OH to connect two major internet exchanges. Construction of the Facebook fiber network will begin this year and take 18 to 24 months to complete, according to a press release. The release came from West Virginia Senator Shelley Moore Capito's office because West Virginia will be a major beneficiary of the backbone. About 275 miles of the fiber will go through the state, the press release said. Capito's press release suggests that this new Facebook fiber network may interconnect with other fiber networks

within West Virginia, perhaps even sell (or otherwise make available) capacity to connecting fiber networks. "As a result of the project, broadband providers will be able to expand middle-mile networks into communities along the route, and it will establish West Virginia as a preferred route for fiber backbone construction." the press release states. Is Facebook getting into the fiber transport business? There's certainly economic benefit to Facebook, besides the public policy PR benefits and exposure the company is receiving. The creation of such a backbone could lessen Facebook data transport connectivity costs between these

internet exchange points. Capito appealed directly to Facebook CEO Mark Zuckerberg, asking for his help to expand broadband in her state. Providing capacity to other network providers could provide additional public relations benefits, and perhaps even revenue. High capacity backbones are seen as keys to development, particularly in rural areas. Perhaps Facebook will commit to invest in more fiber infrastructure that traverses rural markets, interconnecting them as a result. It's doubtful the social media giant would look to this effort as a profit center, but it could provide the company with much needed positive PR.



Huawei Opens Cyber Security Transparency Centre in Brussels

Huawei has opened a Cyber Security Transparency Centre in Brussels, with over 200 representatives from regulators, telecom carriers, enterprises and the media in attendance. Representatives from the European Union (EU), GSMA, and the World Economic Forum spoke at the opening ceremony. The inclusion of the word 'Transparency' in the title as well as the location of the center, right in the heart of the EU, are both telling. The Chinese company, which is the world's biggest telecom equipment maker, is mired in controversy concerning accusations of its equipment being used to spy for the Chinese government, among other things, including sanctions busting. Huawei has stoutly denied all charges and argued

they are politically motivated, but some European countries as well as the US have banned Huawei's equipment from their 5G networks. In January, Poland's internal affairs minister, Joachim Brudziński, called for the EU and NATO to take a "joint stance" on whether to exclude Chinese equipment vendor Huawei from their markets after a n Huawei employee was arrested in Poland on spying charges. In Germany and other European markets, there is great concern about the economic implications of delaying 5G's roll-out by excluding the Chinese company's equipment as it is the leading 5G supplier and Europe is already perceived to be lagging. Hence the center is a major statement about Huawei opening itself to scrutiny in

order to win back trust, as well as a hefty investment and symbol of commitment after Huawei's Chairman threatened to withdraw from western markets during the World Economic Forum at Davos. Ken Hu, Huawei's Deputy Chairman said at the opening, "Trust needs to be based on facts, facts must be verifiable, and verification must be based on common standards. We believe that this is an effective model to build trust for the digital era." He added, "Safeguarding cyber security is considered to be a responsibility held by all industry players and society as a whole. Growing security risks are significant threats to future digital society."

The company says the Centre has three major functions:

- to showcase Huawei's end-to-end cyber security practices, from strategies and supply chain to R&D and products and solutions. Visitors can explore cyber security with Huawei's products and solutions including for 5G, IoT and cloud.
- to facilitate communication between Huawei and key stakeholders on cyber security strategies and end-to-end cyber security and privacy protection practices. Huawei will work with industry partners to explore and promote the development of security standards and verification mechanisms, to facilitate technological innovation in cyber security across the industry.
- to provide a product security testing and verification platform and related services to Huawei's customers.



Telkomsel Concludes Agreement with Huawei to Work on Connected Digital Project in Indonesia

Telekomunikasi Selular (Telkomsel), Indonesia's largest mobile network operator by subscribers, has reportedly signed a memorandum of understanding (MOU) to cooperate on accelerating ecosystem and infrastructure development

towards achieving the development of Digital Indonesia. Light Reading notes that under the MOU signed during this year's Mobile World Congress (MWC 2019) in Barcelona, the two parties will work together to develop 'future evolution,

technology innovation via Joint Innovation Center 5.0, digital services exploration and talent development to position Telkomsel well for supporting the building of Digital Indonesia'

Huawei Releases Its 2018 Annual Report

Huawei released its 2018 Annual Report. According to the report, the company maintained strong business growth in 2018. Its sales revenue rounded off at CNY721.2 billion, up 19.5% year-on-year; its net profit reached CNY59.3 billion, up 25.1% year-on-year. In 2018, Huawei invested CNY101.5 billion (14.1% of its sales revenue) in R&D, ranking fifth globally in The 2018 EU Industrial R&D Investment Scoreboard. Over the last ten years, Huawei's R&D expenditure has reached more than CNY480 billion. According to official data released by the World Intellectual Property Organization (WIPO), Huawei filed 5,405 patent applications to this organization in 2018, ranking first among all companies globally. At the release of its annual report, Guo Ping, Huawei's Rotating Chairman, said, "Information communications technology is rapidly working its way into every industry. This has triggered a digital, intelligent transformation – the driving force behind our digital economy. Through heavy, consistent investment in 5G innovation, alongside large-scale commercial deployment, Huawei is committed to building the world's best network connections. Throughout this process, Huawei will continue to strictly comply with all relevant standards to build secure, trustworthy, and high-quality products. As we work towards this goal, we have been explicitly clear: Cyber security and user privacy protection are at the absolute top of our agenda. We are confident that the companies that choose to work with Huawei will be the most competitive in the 5G era. And countries that choose to work with Huawei will gain an advantage for the next wave of growth in the digital economy." Guo emphasized, "The easiest way to bring down a fortress is to attack it from within. And the easiest way to reinforce it is from outside. Moving forward, we will do everything we can to shake off outside distractions, improve management, and make progress towards our strategic goals. We will continue to

strengthen operational compliance, ensure business continuity and sustainability, and cultivate an open ecosystem where all players collaborate and prosper together. In addition, we will continue our organizational transformation to inspire greater passion and vitality across the organization." In its carrier business, Huawei launched its latest 5G and SoftCOM AI solutions, focusing on making them as simple as possible to use and maintain. 2018 also saw ongoing innovation in domains like premium home broadband and the Internet of Things (IoT), helping carriers seize new growth opportunities. In 2018, the sales revenue of Huawei's carrier business reached CNY294 billion, roughly the same as the year prior. In its enterprise business, Huawei continued providing cloud, big data, artificial intelligence (AI), and IoT solutions, as well as a range of products for data centers, all-flash storage, and WiFi. By integrating these technologies into its digital platform, Huawei has facilitated the construction of smart cities, safe cities, and smart campuses, and has helped drive the digital transformation of its customers in the finance, transportation, and energy

sectors. In 2018, the sales revenue of Huawei's enterprise business reached CNY74.4 billion, up 23.8% year-on-year. In its cloud business, Huawei launched 160 cloud services and 140 solutions, and worked with its partners to serve customers worldwide with 40 availability zones across 23 regions. Huawei has grown its list of partners to more than 6,000 in this domain, and is actively exploring the use of its AI services in more than 200 projects across 10 major industries. In its consumer business, Huawei further increased its share of the global smartphone market and has further enhanced the positioning of its high-end devices. It has also made major breakthroughs in building an intelligent ecosystem for all user scenarios. In 2018, the sales revenue of Huawei's consumer business reached CNY348.9 billion, up 45.1% year-on-year. Financial statements in the 2018 Annual Report are independently audited by KPMG, an international Big Four accounting firm. To download the 2018 Annual Report, visit www.huawei.com/en/press-events/annual-report/2018



Huawei to Adopt OCP's Open Rack across New Public Cloud Datacenters Globally

Huawei Technologies, a leading global information and communications technology (ICT) solutions provider, announced plans to adopt Open Rack in its new public cloud datacenters worldwide. The move is designed to enhance the environmental sustainability of Huawei's new public cloud datacenters by using less energy for servers, while driving operational efficiency by reducing the time it takes to install and maintain racks. The Open Rack initiative proposed by the Open Compute Project (OCP) seeks to redefine the data center rack and is one of the most promising developments in the scale computing environment. It is the first rack standard that is designed for data centers, integrating the rack into the data center infrastructure, a holistic design process that considers the interdependence of everything from the power grid to the gates in the chips on each motherboard. Adopted by some of the world's largest

hyperscale internet service providers such as Facebook, Google and Microsoft, Open Rack is helping to lower total cost of ownership (TCO) and improve energy efficiency in the scale compute space. "Huawei's engineering and business leaders recognized the efficiency and flexibility that Open Rack offers, and the support that is available from a global supplier base. Providing cloud services to a global customer base creates certain challenges. The flexibility of the Open Rack specification and the ability to adapt for liquid cooling allows Huawei to service new geographies. Huawei's decision to choose Open Rack is a great endorsement!" stated Bill Carter, Chief Technology Officer for the Open Compute Project Foundation. As well as Huawei's adoption of Open Rack in its cloud datacenters, the company is also expanding its work with the OCP Community to extend the design of the standard and further improve time-

to-market, and high serviceability and reduce TCO. Last year Huawei became an OCP Platinum Member. This year, Huawei continues investment in and commitment to OCP and the open source community. Huawei's active involvement within the OCP Community includes ongoing participation and contributions for various OCP projects such as Rack and Power, System Management and Server projects with underlying contributions to the upcoming specs for OCP accelerator Module, Advanced Cooling Solutions and OpenRMC. "Huawei's strategic investment and commitment to OCP is a win-win," said Mr. Kenneth Zhang, General Manager of FusionServer, Huawei Intelligent Computing Business Department. "Combining Huawei's extensive experience in Telco and Cloud deployments together with the knowledge of the vast OCP community will help Huawei to provide cutting edge, flexible and open solutions to its global customers. In turn, Huawei can leverage its market leadership and global datacenter infrastructure to help introduce OCP to new geographies and new market segments worldwide." During a keynote address at OCP Global Summit, Huawei will share more information about its Open Rack adoption plans as well as overall OCP strategy. Huawei is also planning to showcase some of the building blocks of these solutions in its booth, including OCP-based compute module, Huawei Kunpeng 920 ARM CPU, Huawei Ascend 310 AI processor and other Huawei intelligent Compute products.



Huawei and Pakistan's Special Communications Organization Sign MoU

Huawei has signed a Memorandum of Understanding (MoU) with Special Communications Organization to further strengthen cooperation in Pakistan. The MoU was signed at a ceremony at the Huawei booth at Mobile World Congress. Signing the MoU on behalf of Pakistan was Mr. Muhammad Fayyaz Khan of the Special Communications' Organization (SCO). Mr. Sun Bohan, Managing Director enterprise department, Huawei Technologies Pakistan (Pvt) Ltd. signed for Huawei. Pakistan's Minister of Information Technology and Telecom Dr. Khalid Maqbool Siddiqui, Director General of SCO Mr. Ali Farhan, Senior Vice President of Huawei Technologies Co. Ltd Mr. Mark Xueman and CEO of Huawei Technologies Pakistan (Pvt) Ltd Mr. Saif Ch witnessed the signing

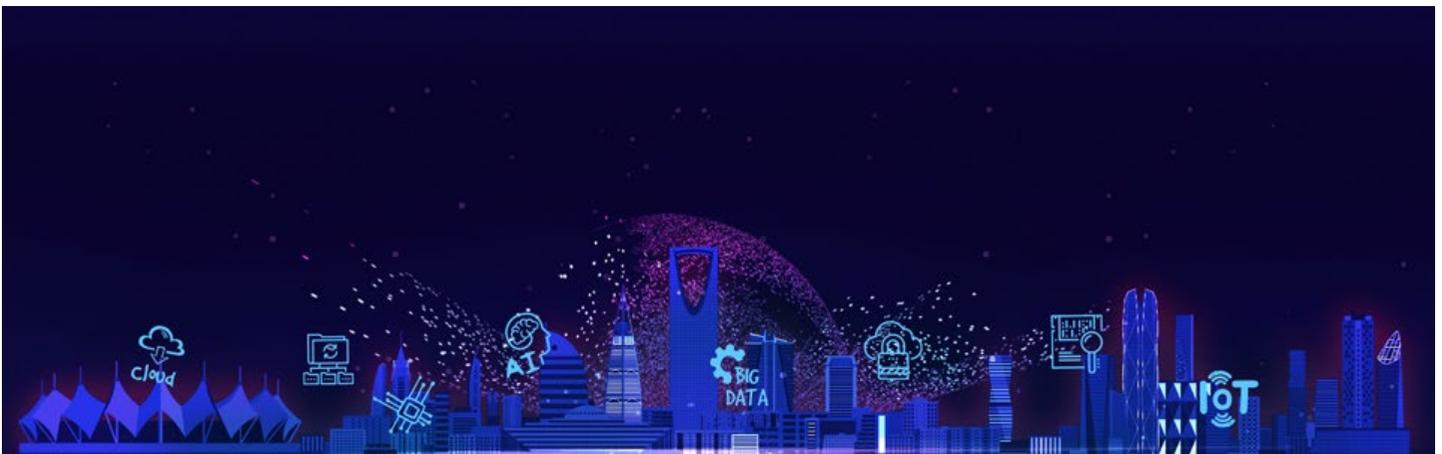
ceremony. Pakistan's Minister of Information Technology and Telecom Dr. Khalid Maqbool Siddiqui spoke to the journalists after the signing ceremony, "if we want to digitalize our country, we need human resources, so I want to create a Regulatory authority for the IT education and increasing the penetration of broadband and smart phones, and we are planning to invite Huawei to take part in this". He also added that "Pakistan is working to connect rural areas with fiber and wireless solutions to make networks ready for 4.5G and 5G, the roadmap to digital transformation requires collaboration between all parties, including vendors like Huawei and service providers, everybody can contribute".

Huawei's Saudi Ecosystem Partner Summit Drives Conversation on KSA's Digital Future

Huawei, as a leading global provider of information and communications technology (ICT) infrastructure, drove forward the conversation on Saudi Arabia's digital future at the Huawei Saudi Ecosystem Partner Summit 2019, held yesterday. Hosted at the Al Faisaliah Hotel in Riyadh, the summit brought together more than 400 delegates from across Huawei's partner and distributor network to share their success stories and explore opportunities to advance the nation's digital ecosystem through Huawei's solutions. The summit focused on the need for organizations and businesses to embrace digital platforms that are not only open, agile and secure, but also capitalize on the transformative powers of Artificial Intelligence (AI). Attendees explored the most effective strategies towards this aim – strategies that will ultimately contribute to the ambitions outlined in Saudi Arabia's Vision 2030 plan. Huawei sees AI and digitization as strategic pillars of Vision 2030, as reflected in the portfolio of current and upcoming products and solutions the brand discussed at length during the summit. Among them, Huawei explored its revolutionary new Wi-Fi 6 product, designed to transform the way enterprises deliver applications on modern Wi-Fi networks with four times the speed of Wi-Fi 5. Wi-Fi 6 provides ultra-high

bandwidth to support 4K ultra-HD video conferencing, ultra-high concurrency for a more stable connection, and ultra-low latency to deliver content instantly. The leading ICT solution provider also explored its all-flash storage system portfolio for summit attendees, explaining how the system can better support mission-critical services. OceanStor Dorado V3, Huawei's latest system iteration, delivers data at faster speeds than competing products, maximizing the benefits gained from data analytics to improve overall business performance. When combined, these technologies and those among Huawei's broader solutions portfolio support the company's aim to build a fully connected, intelligent world where businesses and communities are empowered to perform at a higher level. Huawei is also committed to nurturing the digital talent of the rising generation; in line with this aim, the company used the event as an opportunity to award outstanding engineers its globally-recognized ICT certificate. David Shi, General Manager of Huawei Saudi Enterprise Business said: "As an innovative ICT solutions provider, Huawei is proud to contribute in establishing a healthy ecosystem in Saudi Arabia. We are working hand in hand with our partners to build a fully connected, intelligent Kingdom and support the Kingdom's 2030 Vision. This

has been a hugely rewarding Partner Summit for everyone involved because in just one day, we've heard of so many transformative ideas being shared between attendees. Most importantly, everyone in the room has the power to turn these ideas into positive action, and as their trusted ICT provider, Huawei stands ready to support them." During the Keynotes speech, Dr. Claude E Wells, Managing Director of Saudi Media System, Huawei partner, shared experiences of the challenges they had been facing in business, cooperation with Huawei and his understanding of Huawei capabilities and partnership value. He ended his speech with, "To Huawei, You make SMS want to be a better company." Huawei also used the summit to promote its solid-state drive (SSD) sales offer for attendees, which provides SSDs at the same price as 10K SAS hard disk drives of the same capacity. Other technologies in the spotlight included Huawei's advanced new AI camera for greater campus security, while the impact of the company's Saudi channel policy on expanding its solutions to reach more users was another summit highlight. Supporting Huawei's strategy to share its success with channel partners, the ICT leader also used the summit to present its best sales and pre-sales awards to sales partners.



Huawei Releases “1+1” Antennas, Enabling Ultra-Lean Site in 5G Era

Huawei released the most powerful “1+1” antennas at MWC 2019, including the industry's first 30 ports antenna, the industry's smallest FDD 4T4R+TDD 8T8R converged antenna, and the industry's first fully integrated ultra-wideband multi-sector antenna. These products satisfy maximal configuration for all frequency bands supported by a single passive antenna in different scenarios, reserve space for 5G Massive MIMO deployment, and immediate 5G activation. Based on the three 5G antenna platforms, Munich platform, London platform, and Bangkok platform, Huawei released the following three higher-profile antenna products during the congress.

Munich platform: The smallest 30 ports antenna, supports full-band 4T4R deployment on Sub-3 GHz bands and independent adjustment of each band's coverage. It is suitable for operators



with rich spectrum resources or antenna sharing scenario.

London platform: With the length of only 1.5 meters, one antenna supports FDD 4T4R and TDD 8T8R deployment, builds 5G extreme lean site and realizes 5G evolution with zero antenna space addition, enables rapid 5G activation.

Bangkok platform: It is designed for the next-hop of FDD capacity expansion solution, improving site capacity by more than 2.5 times. One antenna supports flexible 4T4R 6-sector and 4T4R 3-sector hybrid configuration, maximizing both spectrum efficiency and site resource utilization.

At the beginning of 2018, Huawei was the first to propose the concept of “1+1 antenna, go for 5G” and released 5G-oriented full-scenario “1+1” antenna solutions. These solutions aim to resolve 5G site evolution problems such as insufficient space, high TCO, and difficult acquisition, and enable 5G ultra-lean site deployment. To meet these requirements, Huawei has invested more in R&D, developed many leading technologies, and applied them the new products. Innovative architecture reduces antenna size. Multi-layer interleaved design reduces the size of FDD/TDD converged antenna by about 50% compared with traditional architecture. Compact side-by-side array architecture, with over 10% less width than any similar architectures in the industry, realizes smaller size but 2dB higher gain. Leading-edge technologies improve performance and reliability. The AirMAX feeding network technology improves radiation efficiency by 18% and greatly improves the antenna reliability and production efficiency. Basic technologies research enables antenna's continuous evolution. MQ4/MQ5 cluster connector, which has been selected as the 5G early deployment solution by NGMN, enables the development of 5G antennas with 10+ bands, greatly simplifies antenna installation and maintenance; New radome material GFRPP, which is 40% lighter than the traditional fiberglass, keeps multi-band antenna weight less than 50kg to avoid antenna hoisting, and saves installation time and cost. Mr. Zhang Jiayi, President of Huawei Antenna Business Unit, said that “We deeply understand that antenna space problem is the bottleneck of 5G site deployment. Therefore, Huawei has spared no effort in antenna R&D and innovation to offer industry-leading ‘1+1’ antenna solutions, to enable 5G ultra-lean site deployment, help operators achieve business success in 5G era.”

Huawei Launches World's First 50G PON Prototype

Huawei has unveiled the world's first single-wavelength 50G passive optical network (PON) prototype at the Mobile World Congress 2019 (MWC 2019). The prototype, which can provide 50 Gbps downstream transmission rates and 25 Gbps/50Gbps upstream transmission rates over a single wavelength, demonstrates that next-generation PON technology is now mature enough to begin focusing on product development—a much-anticipated

milestone in the technology's development and a welcome confidence boost for the 50G PON industry. Compared with 10G PON, the 50G PON technology not only increases the bandwidth fivefold, but also effectively supports innovative services such as 5G and Cloud VR, services which pose strict requirements on delay and clock synchronization. 50G PON has been considered as the next-generation PON technology standard by industry

standards organizations, operators, and equipment vendors for some time now. In February 2018, the ITU-T officially initiated the 50G PON standards project and began developing technical solutions and standards. The standards are expected to be finalized in 2020 and put into commercial use in 2023. As a key member of the ITU-T and IEEE, Huawei has actively participated in research into 50G PON technology, contributing

standards documents and conducting innovative research in collaboration with mainstream global operators. Launching the first 50G PON prototype represents Huawei's latest and most significant move in the support of 50G PON research, providing a means of verifying the feasibility of 50G PON productization and supporting the development of the next generation PON industry. Developed based on mature 25G optical components, Huawei's 50G PON prototype achieves 50 Gbps transmission rates over a single wavelength through fiber dispersion compensation and transmitter/receiver bandwidth compensation technologies

on the physical PON links. Under the 1:64 split ratio, the prototype supports transmissions over 20 km, and enables customers to smoothly transition to 50G PON networks without needing to change the ODN of the live network. The prototype is also fully compatible with XG(S)-PON and 10G-EPON in the 50G PON wavelength planning. To protect operators' investment, 50G PON boards are designed so that they can be inserted and run in the Huawei new-generation smart distributed OLT MA5800. During the onsite demonstration, the prototype reduced the upstream one-way delay from the millisecond level down to the microsecond level while achieving

a tenfold improvement in clock precision. This suggests that the prototype is well suited to the needs of future digital home broadband, government/enterprise cloud private lines, and 5G bearer services. Huawei has been actively investing in the research and standardization of ultra broadband access technologies, and has held important seats in multiple standard organizations such as ITU-T, IEEE, and BBF. Huawei is committed to providing operators with future-oriented innovative solutions, promoting the healthy development of the ultra-broadband industry, and building a smarter, better-connected world.

Peter Zhou of Huawei: 5G Will Promote Development of Cloud X Industries

Enhanced Mobile Broadband (eMBB) services oriented toward individual consumers will be the main business scenario at the initial stage of 5G deployment. 5G is in desperate need of an iconic service that can bring new value to operators, such as short message service (SMS) for 2G, Social Networking Service (SNS) for 3G, and mobile video for 4G. Cloud X may be a great opportunity. Cloud X services include Cloud PC, Cloud Gaming, and Cloud AR/VR. 5G networks feature large bandwidth and low latency, ensuring the consistency of user experience. Complex computing and image rendering are migrated to the cloud so that terminals can go beyond the limits of their capabilities. This is the service logic of Cloud X, which can be summarized as "Cloud APP, Broad Pipe, and Smart Device". The Huawei Cloud PC is already in commercial use in EMUI 9.0 and 4G

networks in China, and it is well recognized by consumers. In the future, the 5G Cloud PC will be usable in more scenarios and support image quality of up to 4K at 60 frames per second (FPS). In this way, the 5G Cloud PC can serve as the mobile Ultrabook, mobile workstation, and mobile game console. Under the development of X Labs, the 5G Cloud PC is expected to be released to the public in May. In addition, based on the Cloud PC infrastructure, Huawei released the 5G Cloud VR service for China in January of 2019. This service consists of three modules: the Cloud VR Dev Kit, the 5G Cloud VR Connection service of Huawei Cloud, and the Cloud VR Developer Community. The Cloud VR Dev Kit is for offline development. Developers can develop content on the local area network (LAN). The Huawei Cloud 5G Cloud VR Connection service adapts content to the operators' networks on the cloud for

commercial use. The Cloud VR Dev Kit can not only directly provide commercial services for industry users but can also be subsequently developed and integrated by developers. The Cloud VR Developer Community is for communication, interaction, and experience sharing. Based on the original Cloud VR Dev Kit, Huawei released the global version of the 5G Cloud VR Dev Kit during the MWC 2019 in Barcelona to support developers, integrators, and operation platforms outside China. "On the eve of the exponential growth of 5G, this service can nurture a large number of Cloud VR applications, which will benefit all because of the low cost and low threshold for using the cloud." Peter Zhou, Chief Marketing Officer (CMO) for Huawei Wireless Solution, said, "The technical feasibility of Cloud X services, such as Cloud PC, Cloud Gaming, and Cloud VR, has been verified on the live network. Now the industry must build a sound ecosystem and provide better 5G network services." We are pooling all of our talents and working together to develop Cloud X. At the Ninth Global Mobile Broadband Forum (Global MBBF) in November 2018, the Global System for Mobile Communications Association (GSMA) announced the establishment of the Cloud AR/VR Forum. Founding members include Huawei and more than 25 industry partners and operators. This year, the updated Cloud X Industry Alliance Program is in the planning stage for further promoting industry development.



Saudi Arabia and Huawei Sign 5 MoUs at the Saudi-Chinese Investment Forum

Huawei, a leading global provider of information and communications technology (ICT) infrastructure and smart devices, joined the Saudi-Chinese Investment Forum to share its success stories and future goals to drive the Kingdom's digital transformation through Chinese investment. The one-day event, supported by HRH Crown Prince Mohammed Bin Salman, deputy premier and minister of defense, was hosted in collaboration Saudi Arabian General Investment Authority and the International Cooperation Centre of National Development and Reform Commission in China. The event witnessed the attendance of more than 1,000 decision makers, investors and visitors interested in Saudi market. Huawei's Vice President, Mr. Mark Xue, joined the first plenary session of the forum under the title 'Creating A Better Business Environment for Chinese Investors'. The meeting involved the chairman of Royal Commission for Jubail and Yanbu, HE Eng. Abdullah Al Saadan, the CEO of the National Industrial Development and Logistics Program, Eng. Uwaidh Al-Harethi, and the director general of Saudi Industrial development fund, Dr. Ibrahim Almojel. During the session, Mr. Xue explored the development of the Kingdom's business environment along with success stories of Chinese investment in Saudi Arabia. "Our success in Saudi Arabia today is thanks to the fair and efficient business environment the Saudi government has built with us over the years. We see the Kingdom as our long-term strategic partner, as we aim to fulfill our corporate responsibilities in Saudi Arabia and continue to invest in stable, long-term evolution. During the past 14 years we've deployed more than 6,500 field engineers and 4,000 R&D personnel to guarantee the stability of the communications network during the Hajj Seasons in Macca city in collaboration with our local partners," commented Mr. Xue. Huawei's Vice President continued by exploring the solution provider's future goals: "Huawei will continue to invest in ICT talent development. We will train 10,000 ICT professionals in 2022 and certify 5,000 professionals in the Kingdom



alone. Our aim is to proceed with our investment in developing the latest ICT infrastructure in Saudi Arabia and support the country's digital transformation. At the same time, we continue to invest 20 million US dollars each year in local innovation and 500 million US dollars yearly for local procurement to grow with our 140 local partners." According to the Saudi Press Agency (SPA), 35 joint bilateral economic cooperation agreements, worth more than 28 billion US dollars, were signed at the forum between the Kingdom of Saudi Arabia and the People's Republic of China. Within those agreements, 5 Memorandum of Understanding (MoU) were announced between Huawei and Saudi ministries and companies. The MoUs are a testament to Huawei's commitment to developing an advanced and healthy digital ecosystem in the Kingdom and its dedication to working alongside Saudi ministries to develop a progressive ICT infrastructure. Doing so will drive the Kingdom's anticipated socioeconomic growth, while supporting government targets outlined in the National Transformation Program 2020 and Saudi Vision 2030. Notable MoU signings at the event included those with various governmental entities, the Ministry of Energy, the Industry and Mineral resources, the Ministry of Communications and Information Technologies, and the Ministry of Hajj and Al Umrah. Other growth-focused agreements were signed with Saudi companies, including the Saudi electricity

company, Dawiyat and ACWA Power. These private sector agreements focused largely on the areas of smart city, smart campus, smart logistics, smart education, smart traffic, smart grid, smart security, smart roads and digital transformation for renewable energy etc. The signing with ACWA Power will see the power developer, investor, co-owner and operator apply AI and big data to deliver Smart PV for end users. The arrival of Smart PV - enabled by Huawei - will help accelerate the development of the renewable energy sector while also achieving greater power generation and lower maintenance costs. The implementation of PV can reduce the Kingdom's dependence on oil by 20-30 percent, while aligning with the economic diversification goals of the country. Huawei's global vision is to bring digital to every person, home and organization, for a fully connected intelligent world. The company has actively worked to ensure that every corner of the Kingdom enjoys high-speed broadband access and has delivered high-quality connectivity to millions, including multiple government projects. Huawei has also implemented many of the Kingdom's most innovative and forward-thinking projects to guarantee sustainable ICT development. One example is the activation of an ICT skills competition, which has selected and trained more than 8,000 Saudi ICT professionals through Huawei-run academies to date.

Huawei's ON2.0 Solutions Win Three Optical Network Innovation Awards at OFC 2019

During the Optical Fiber Communication Conference and Exhibition (OFC), optical network mainstream media Lightwave presented their annual outstanding innovation awards in the optical communication field. Huawei won awards for its 600G, Optical Cross Connection (OXC), and Optical Intelligence solutions, which represent technologies in three key domains: coherent transmission, optical switching, and O&M. The three innovation awards fully demonstrate the industry's recognition of Huawei's innovation in optical networks and specify the direction for the development and evolution of next-generation optical networks. Lightwave selects award winners based on the influence of candidate technologies on academic thought, technological innovation, and business value at OFC every year. The awards are intended to commend the enterprises, organizations, and institutions that have made significant technological innovations and to guide the direction of technology development for the entire industry. At Mobile World Congress (MWC) 2019, Huawei officially launched the Optical Networking 2.0 (ON2.0) strategy for building a next-generation optical network centered on user experience with new speed, new sites, and new smart O&M, which are implemented in the three innovative solutions of 600G, OXC, and Optical Intelligence. Huawei's 600G solution is a coherent transmission solution that has the highest single-wavelength rate in the industry and is already commercially deployed. It uses Huawei's latest-generation OptiXtreme oDSP chips and the Channel-Matched Shaping (CMS) algorithm to support programmable and flexible adjustment of multiple code patterns from 100G to 600G, providing a capacity 50% higher than the second highest single-wavelength capacity (400G) that has been commercially used in the industry, and providing the industry's highest spectrum efficiency of 8 bit/s/Hz. Based on this

solution, Huawei has piloted the world's first 600G innovative site with UAE Etisalat, and verified that the single-wavelength 600G solution can be commercialized on a large scale and effectively support the expansion of new services in the future. Huawei's OXC solution uses Huawei's core technologies, such as all-optical backplane, high-density component integration, and LCoS-based AD WSS, to achieve the petabit-level switching capacity of a single subrack. This allows it to lead the generational evolution of the optical-layer, build simplified sites, achieve zero fiber connection between equipment and simplify O&M, and reduce required equipment footprint by 80% and power supply by 60%. It also helps customers to quickly build 3D-mesh backbone networks and enables one-hop service connection. Currently, Huawei's OXC solution has been put into commercial use in the networks of China Mobile and Indonesia XL Axiata. Huawei's Optical Intelligence solution uses AI algorithms, and a vast fault database to perform deep machine learning, and predict potential faults in

optical networks, transforming O&M from passive reaction to proactive prevention. The solution supports one-click intelligent optimization, which, combined with alarm compression and root cause location, improves O&M efficiency by 30%. Simon Lu, President of Huawei's Transmission Network Domain, commented, "It is a great honor for Huawei's ON2.0 solutions to win the three innovation awards from Lightwave. This is not only a recognition of Huawei's continuous innovation in the optical network field, but also supports the direction of innovation in the upstream and downstream industries of the next-generation optical network industry. Huawei will continue to promote the innovation and incubation of ON2.0 solutions, drive bandwidth upgrades as per Moore's Law, simplify sites, and move towards autonomous driving networks. Huawei will also collaborate with upstream and downstream industry chains to build next-generation optical networks centered on user experience to maximize business value for operators."



Huawei Releases Optical Networking 2.0 Solution for the 5G Era



At Mobile World Congress (MWC) 2019, Huawei officially released the Optical Networking 2.0 (ON2.0) solution. This solution enables new speed as per Moore's law of bandwidth to maximize fiber value, new site (simplified sites) to reduce costs, and new smart O&M to evolve towards autonomous driving networks. This solution will continuously reduce O&M costs and enable service innovation. In the 5G era, we are seeing new 2C, 2B, and 2H services emerge constantly, driving the CT industry to a new stage of development as well as posing greater challenges to transport networks: In the 2C field, the revenue of operators is not increasing at the same rate as data usage; in the 2B field, operators' market share is being eroded by cloud service providers (CSPs); in the 2H field, user experience is not sufficient for supporting the development of emerging services and complex networks increase network O&M costs. Bandwidth needs must be satisfied. However, the bandwidth-driven development model can no longer support the revenue growth of operators and needs to be transformed to experience-driven. Kevin Huang, CMO of Huawei Transmission & Access Network Product Line, unveiled the ON2.0 solution at MWC 2019. Kevin Huang, CMO of Huawei Transmission & Access Network

Product Line, said "We need to streamline optical access and optical transport networks to build a 5G-oriented end-to-end (E2E) optical infrastructure network. This will help operators build integrated optical networks with optimal per-bit cost and assured E2E service quality to cope with the challenges in the 5G era." Against this backdrop, Huawei releases the ON2.0 solution, which has the following three core values.

New Speed: The Moore's Law of bandwidth will drive the E2E technological innovation in access, metro, and backbone networks to continuously improve bandwidth and maximize the value of fibers. In addition, Wi-Fi 6 is used to accelerate home access, Flex-PON2.0 to seamlessly upgrade GPON to 10G PON, Super 200G to improve single-carrier rate, and Super C Band technology to maximize the potential of optical fiber spectrum, achieving Moore's Law in the optical domain.

New Site: Optical networks, including access, metro, and backbone networks, will be simplified in an E2E manner to significantly reduce required equipment room resources. On the access side, unified access over multiple types of media will be implemented to simplify access sites. On the metro side, MS-OTN will be used to carry multiple types of services,

simplifying CO sites, streamlining access and transport networks, and achieving one-hop connections. On the backbone side, all-optical cross-connection will be used to build 3D-Mesh backbone networks and simplify fiber connections, achieving all-optical grooming.

A digital twin will be built on top of the physical optical networks by using AI, big data, and cloud technologies. This transforms O&M from passive to proactive and site configuration from manual to automatic and intelligent, facilitating the evolution towards autonomous driving networks. As for scenarios, such as premium broadband, premium private line, and network health prediction, intelligent technologies will be used to reduce O&M costs and ensure optimal service experience. With the ON2.0 solution, Huawei can help operators achieve "optical network as a service" and transform transport networks from connection-centered to experience-centered, enabling the business success of operators. Currently, Huawei has innovated collaboratively in ON2.0 with operators around the world to support their business growth. Huawei has worked with China Mobile to develop an OTN 4K premium video live broadcast solution to provide superb video experience by building non-blocking and zero-packet-loss pipes. Huawei has collaborated with Fastweb in Italy to incubate a premium private line solution, reducing service provisioning time from months to weeks and providing 99.999% high availability. Huawei has also cooperated with another Europe operator to accelerate the innovation in premium broadband solution, which supports E2E access network topology inference and accurate fault demarcation, reducing onsite visits by 30%. Kevin Huang said "The global optical network industry is experiencing a major generational inflection point. Huawei will cooperate with upstream and downstream partners to build a next-generation 5G-oriented optical network and embrace a fully connected, intelligent world."

Huawei Wins 'Market Development Award' from GTI for Its Outstanding Performance in 5G Commercialization

At the GTI Awards Ceremony held in Barcelona, Huawei won the 'Market Development Award' from GTI for its outstanding performance in the 5G commercial market and for its promotion of the end-to-end 5G industry. In 2018, with the completion of the 3GPP R15 NSA and SA standards, 5G technical testing and pre-commercial verification were launched worldwide. With long-term investment and deep accumulation in 5G technology and standards, Huawei has kept up closely with the 3GPP standards pace and has released its 5G end-to-end pre-commercial solutions including core network, transport network, wireless network, 5G LampSite, and 5G CPE. Additional in the cities of Hangzhou, Shenzhen, Seoul, Milan, and Berlin, Huawei has launched scale trial networks and continuous outfields, with the test data showing that Huawei's technology is 12 to 18 months ahead of other companies in the industry. Up to now, Huawei has cooperated with more than 50 business partners worldwide in 5G commercial use, ranking first in the number of partners that it works with. The company has also obtained the largest number of 5G commercial contracts (30+) in the world. In addition, Huawei has delivered over 40,000 5G base stations for commercial use globally. In cities such as Hangzhou in China and Seoul in South Korea, Huawei are deploying thousands of sites to comprise continuous 5G massive MIMO coverage, with an average experience rate over 1 Gbps, which lays the foundation for abundant large bandwidth and low latency services. Huawei is also a strong supporter of GTI, who have been committed to TD-LTE commercial evolution, 5G global industrialization and cross-industry innovation. In 2019, more intensive 5G pre-commercial testing and commercial deployments will occur around the globe, while many mainstream terminal manufacturers in the industry will also release 5G

chipsets and smart phones for commercial use, which will greatly promote the maturity of the entire industry. Together with GTI, Huawei will work with global partners to promote and accelerate the maturity of the 5G end-to-end industry and promote 5G scale commercialization, so that the excellent experience brought by 5G will benefit more consumers and industries.



Mobily is Building Its Own Cloud Network with Ericsson's and Huawei's Cloud Solutions

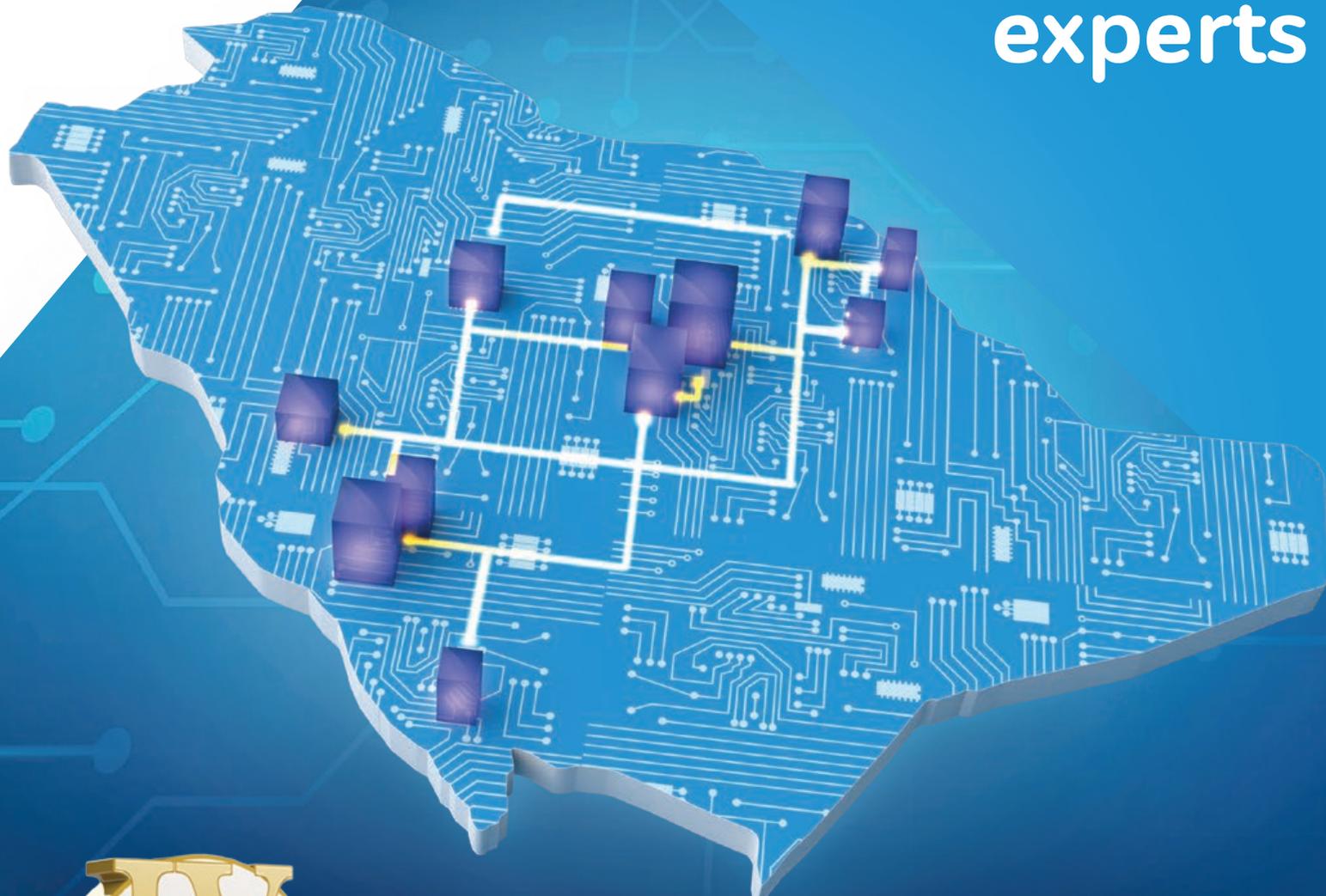
In collaboration with Ericsson and Huawei, Etihad Etisalat "Mobily" has built its own cloud network, to provide a flexible and agile network that can support the development of new services and improve customer experience. Cloud solutions contribute in improving the core network needs to evolve an architecture that can consolidate some functions and distribute others to deliver flexibility, efficiency and low latency. Besides, the deployment of the Ericsson solution will provide Mobily's

live network with a 5G-ready core and will help the network scale as IoT adoption increases. Eng. Maziad bin Nasser Al-Harbi, Chief Technology Officer of Mobily, said: "Cloud solutions will help meet the growing demand for new network services to help improve productivity and efficiency. The Telecom Cloud provides a ready infrastructure for the 5G technology and IoT, which will serve enterprise customers in particular. Mobily's customers will receive many benefits, such as reduced

data transfer time, dedicated vertical network solutions and optimal distribution of the network's core capabilities". Noting that Mobily moves in line with the Kingdom's Vision 2030 and exerts all efforts to be well prepared for digital transformation, by implementing latest cutting-edge technologies to meet the increasing growth of all services and the data services in particular.



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Mobily and ITC Collaborate with Cisco to Modernize Their Networks

Etihad Etisalat “Mobily”, Integrated Telecom Company (ITC) and Cisco announced their collaboration on a project to modernize and upgrade Saudi National Fiber Network (SNFN) to prepare it for the next phase of growth in the field of ICT. Cisco’s task was to modernize and unify the partner’s networks by implementing state-of-the-art optical, packet technologies and architectures; thus, providing Mobily and ITC with unprecedented geographic reach in main cities, rural and remote areas; which will enable it to fulfill customers’ demands in a fast and cost-effective way. The project aims to migrate Mobily and ITC Synchronous Digital Hierarchy (SDH)

network to a modern and high-capacity Gigabit Ethernet-Dense Wave Division Multiplexing (GE-DWDM) network. Furthermore, the project purpose is to integrate two parallel long-haul networks and build a unified long-haul DWDM network supporting up to 200G and 400G speeds and extend Mobily’s long-haul networks in rural and remote areas to DWDM network. The highly scalable DWDM and Ethernet network capabilities should provide optimum support for Mobily’s growth plans, by providing extensive coverage in major cities and remote areas across all regions of Saudi Arabia. Importantly, both opex and capex have

been lowered through the simplification of the network operations, while reduce the launch time of new services in the market. Eng. Maziad AlHarbi, Chief Technology Officer at Mobily, said: “The new network will enable Mobily to reduce network operating costs. In addition, it will increase our capability to provide high-speed connectivity at 1G, 10G, and 100G speeds to most of our targeted remote areas at a low cost, which comes in line with the company’s plans to support one of the key programs to achieve the vision of the Kingdom 2030 to build a Digital Society and Economy”.





A1 Chooses Nokia as Partner to Deploy 5G in Austria



A1 Telekom Austria has announced the signing of a contract with Finnish vendor Nokia to expand 5G mobile communications in Austria. The contract continues the long-standing partnership between the pair which has included the expansion of 3G and 4G LTE mobile networks and the rollout of Austria's largest fiber-optic network. The contract includes both Nokia's 5G radio access and cloud-native 5G core technology to ensure 'seamless high-performance service and excellent user experience' over wireless, fixed or converged networks. 'Together with Nokia, we will leverage the full potential of 5G,' commented A1 CEO Marcus Grausam, adding: 'we rely on a trusted and long-standing partner with whom we have already successfully implemented numerous major projects. Now the starting signal has been given for the Austria-wide deployment of the A1 5G network, which will open up new worlds of applications and transform business models.'

Liquid Telecom Selects Nokia to Deploy Multiple 100G DWDM/OTN Channel Network in East Africa for Expanded Broadband Services

Liquid Telecom Kenya, part of the leading pan-African telecoms group Liquid Telecom, and Nokia has announced a two-year partnership to upgrade their existing fiber network to support OTN/DWDM technology with an initial network capacity of 500G. This will result in a faster and more reliable connection along the route from the Indian Ocean to datacenters in Kenya, Uganda, Rwanda and neighboring countries. Powered by the Nokia 1830 Photonic Service Switch (PSS), the upgrade allows Liquid Telecom to meet the growing demand from its carrier, mobile operator and internet service provider (CSP/ISP) customers for higher-capacity inter-networking services. The network will support high-capacity connections from the submarine landing stations in Mombasa, Kenya, to major datacenters in Nairobi, Kenya, Uganda and Rwanda, as well as surrounding markets. Liquid Telecom will become the first communications solutions provider to connect through their own network with nearly every country that borders Kenya whilst also providing an alternate fiber route to submarine for other landlocked countries such as Ethiopia, Rwanda and DR-Congo. Ben Roberts, CTO,

Liquid Telecom, said: "We believe that every individual on the African continent has the right to be connected. This is the vision that has been driving our network expansion across Africa. By teaming up with Nokia, we have been able to quickly adapt to the industry's rapid growth within the region and greater access to our high-speed fiber network and cloud services across East Africa. This comes at a time when more mobile operators are planning to increase their backbone bandwidth as they prepare for 5G which is driving the demand for high speed city to city internet links." The deployment began in October 2018, and is expected to provide enhanced services to thousands of corporate customers and FTTH users, and has the potential to reach over 85 million mobile subscribers across Kenya and its neighboring countries. Daniel Jaeger, head of the Central, East and West Africa Market Unit at Nokia, said: "As an industry-leading optical network provider, Nokia has enabled customers to maximize network capacity and efficiency while supporting the deployment of mission-critical services. With our DWDM/OTN network, Liquid Telecom can offer the high capacity

and low latency needed for its customers, ensuring an excellent customer experience and ultimately connecting all of Africa to the digital world. This network will be an important, additional backbone network with Nokia technology across Africa." Liquid Telecom selected Nokia's DWDM and OTN technologies for increased capacity and bandwidth, and the ability to support long distances. The Nokia solution allows Liquid Telecom to reuse its existing Nokia DWDM infrastructure, which reduces its capital expenditures. The solution will initially be available on the following routes:

Nairobi - Mombasa: high-capacity interconnections from Nairobi datacenters to the submarine landing stations at Mombasa

Nairobi - Kampala: opens a new high-capacity route to Uganda, Rwanda and beyond

Nairobi - Namanga: opens a new high-capacity route to Tanzania

Nairobi - Ethiopia: opens a new high-capacity route to Ethiopia and gives the landlocked country an alternate route to the submarine connection in Djibouti

Jazz Taps Nokia for 5-Year 4G Network Expansion Project

Pakistani mobile operator Jazz and Nokia have signed a contract to support Jazz's 4G network expansion. Nokia radio equipment will be deployed in the central and southern Punjab province as well as the Sindh and Baluchistan provinces, enhancing delivery in densely populated cities including Faisalabad, Multan, Bhawalpur, Rahimyar Khan and Sukkur. Jazz's network expansion and upgrade project will cover more than 4,000 4G sites. In this project, Nokia AirScale radio stations will be deployed to expand 4G coverage nationwide and MIMO technology will enhance capacity and speed, whereas Nokia AirFrame-based cloud controllers are expected to improve efficiency. Jazz will use the Nokia NetAct to monitor the entire network.



Nokia Selected by Indosat Ooredoo for IP/MPLS Network Upgrade

In a press release, Finland-based Nokia says it has been chosen by Indonesian fixed and mobile operator Indosat Ooredoo to upgrade its IP/MPLS network to meet pent up demand for high speed internet services. The first year of the multi-year network upgrade will include Jakarta, Jabodetabek and the rest of Java, it confirmed, noting that the Nokia IP/MPLS

solution will include Nokia IP Anyhaul for Indosat's mobile transport network, upgrading its performance and making it 5G-ready. Further, the network expansion deal will see Nokia upgrade Indosat Ooredoo's existing Nokia 7750 SR-12e platforms with its FP4 network processor, as well as the additional installation of the new generation of FP4-equipped 7750 SRs.

The vendor claims that 'Nokia FP4's ability to handle the massive traffic increase, coupled with the Service Router portfolio's ability to support the highest port densities of 10GE and 100GE links that are required in the densest metropolitan areas, were key to Indosat's selection of Nokia for this network expansion'.

Viu Pushes Social Media Engagement to New Heights with Viu Original's Reality Travelogue "No Sleep No FOMO"

Viu, a leading pan-regional OTT video service from PCCW Media Group with more than 30 million monthly active users, launches a new premium production No Sleep No FOMO. This Viu Original production is the first ever pan-regional travelogue with social media engagement at its heart. The series rides on the lifestyle phenomenon of FOMO (Fear Of Missing Out) and turns an original YouTube challenge into a new innovative show with high-end production that takes the audience on a comedic and highly energetic journey to Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Switzerland and Thailand. Members of the cast of No Sleep No FOMO, which features today's hottest Asian

celebrities and social media influencers, are dropped into unexpected destinations and tasked to complete the FOMO list. In each episode, the celebrities are required to complete 60 fun and exciting missions within 60 hours without sleep. The missions include riding a buggy with a facemask on in the Philippines, staying in an abandoned haunted hotel in Indonesia and performing at a standup comedy club in Malaysia. The protagonists will in each episode discover new adventures, explore interesting locations, experience wild things, encounter new people, indulge in local delicacies and refresh their minds and bodies. The host, Singapore's entertainment veteran Paul Foster, is joined by celebrity co-hosts Kim Jong Kook from

the hit-show Running Man (South Korea), singer/songwriter Eric Nam (South Korea), and social media stars Hana Tam (Hong Kong), Kevin Woo (South Korea), Alexander Lee Eusebio (South Korea), Benjamin Kheng (Singapore), Nat Ho (Singapore), Lauren Uy (the Philippines) and Taya Rogers (Thailand). Together they reach a remarkable fan base of more than 12 million social media followers. No Sleep No FOMO is also Viu Original's first production to include a new interactive element that lets viewers engage directly with the show and its cast members. Dubbed as 'Viu Engage', the new element gave social media followers and audience the opportunity to co-create segments in the show. Fans were able to follow and watch



No Sleep No FOMO come to life through dedicated hashtags #ViuNoSleepNoFomo and #ViuEngage, as well as to influence the course of the social media stars' adventures by interacting on their social media channels in real-time. Since the beginning of the production, the social media posts of No Sleep No FOMO have organically reached three million users and generated more than 600,000 social interactions. Ms. Janice Lee, Managing Director PCCW Media Group, said, "There are more than 3.4 billion active social media users in the world today which represents nearly 80% of all Internet users.¹ The digital generation is constantly and actively engaging on social media, in particular with their social media idols. We want to embrace this phenomenon, and therefore put social media at the heart of No Sleep No FOMO.

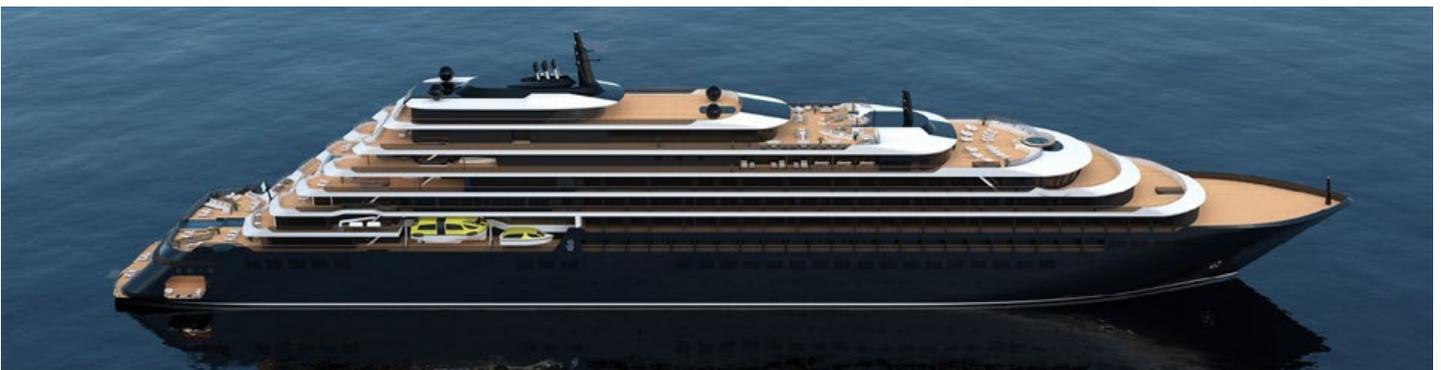
We have integrated new interactive social media elements into the production and let our fans participate and be a part of their idols' adventures, turning viewers into active co-creators of the show." No Sleep No FOMO is based on a format owned by global content agency The Story Lab. It also marks the first collaboration of The Story Lab, part of Dentsu Aegis Network, with a regional OTT player. Mr. Michael Iskas, Global President of The Story Lab, said, "We are thrilled to be collaborating with Viu on No Sleep No FOMO for key Asian markets. Audiences across the region are keen to further engage through content of high entertainment value, making this the perfect project to launch on the platform." Viu has grown from 16 million users in 2017 to 30 million users in 2018, with high levels of engagement. Ms. Janice Lee added, "Our goal is to grow and build deeper connections with audiences in Asia. No Sleep No FOMO is aimed at achieving that. By bringing the show to selected markets where Viu is a leading OTT service and with the introduction of new interactive elements, we hope to engage with our Viu-ers even more and be locally relevant to them. It will provide brands a unique opportunity to reach such a super-connected and captive digital audience." The pan-regional production includes eight episodes and will be available for free from March 22, 2019 on www.viu.com and on the Viu mobile apps across seven markets including Hong Kong, Singapore, Malaysia, Myanmar, Indonesia, the Philippines and Thailand. Ms. Janice Lee, Managing Director of PCCW Media Group (center), Ms. Helen Sou, Senior Vice President of Digital Media, PCCW Media (4th from right), together with the celebrities and social media influencers, announce the launch of No Sleep No FOMO.

SES[^] | Networks

SES Networks Provides Connectivity for Ritz-Carlton Yacht Collection

SES Networks will be providing a fully-managed hybrid broadband connectivity service to The Ritz-Carlton Yacht Collection, a luxury fleet comprising of three custom-built yachts. Representing a first for a luxury hotel operator, The Ritz-Carlton Yacht Collection will bring the brand's service to the seas. The inaugural yacht will set sail in February 2020. Delivered as an end-to-end managed network service, SES Networks' Maritime Solution combines the low latency of the O3b Medium Earth Orbit (MEO) satellite constellation with the reach of SES' large fleet of Geostationary

Earth Orbit (GEO) satellites. In addition to its high throughput capabilities, the SES Networks cruise solution is scalable and able to respond to changes in demand. "As the provider of transformational, ultra-fast, and consistently reliable connectivity to the world's leading cruise operators, SES Networks is uniquely positioned to ensure that The Ritz-Carlton Yacht Collection meets every connectivity demand of its guests wherever they may be," said SES Networks Vice President (VP) Global Maritime Services Simon Maher.



Benin Accelerating Roll-Out of Digital Terrestrial Television with SES

Viewers in the Republic of Benin are now receiving 15 new Free-to-Air (FTA) channels from satellite, thanks to a new agreement the Government of the Republic of Benin has signed with SES, the world's leading satellite-based solutions provider. As part of the agreement a number of High Definition (HD) channels will be broadcast over Benin, making it the first HD channels to be available over Digital Terrestrial Television (DTT) service across Africa. This marks an important step forward in the digital switchover for the country, which intends to switch off analogue service in 2020. To meet the high service availability and nationwide coverage requested by Benin, SES will be utilizing powerful spot-

beam capacity on SES-14. This satellite with a high throughput payload will deliver video feeds to the DTT infrastructure across Benin, with Direct-to-Home (DTH) service filling in any gaps of DTT coverage. SES-14 was launched in January 2018 and is located at 47.5 degrees West. "SES has delivered a creative solution to us to ensure the introduction of digital television with HD channels. This is an important milestone as we move toward our deadline for the analogue switch-off," said Darius Quenum, Chairman of the DTT Steering Committee at Presidency of the Republic of Benin. We are very pleased to be working with SES, which has both the technical capabilities and required experience to support our

ambitious plans to set new standards for broadcasting." "We are excited to be working with the committee leading the digital television transition of Benin to deliver such high-quality service to the people of Benin," said Clint Brown, Vice President, Sales & Market Development for Africa, SES Video. "Launching HD service can be complex, and we are dedicated to providing innovative solutions to respond to market needs. Launching this DTT and DTH service is an important step for Benin and we are in the best position to successfully deliver the complete set of services required."



Turki Alnader Joins Tech Mahindra as Vice President Sales for Communications, Media & Entertainment Business in Saudi Arabia



TURKI ALNADER

Joins Tech Mahindra as
**VICE PRESIDENT SALES,
COMMUNICATIONS,
MEDIA & ENTERTAINMENT**
Business at Saudi Arabia

Tech Mahindra Ltd. a leading provider of digital transformation, consulting and business reengineering services and solutions, announced the appointment of Turki Abdullah Alnader as Vice President Sales, Saudi Arabia for their telecom division. Tech Mahindra, which is part of a diversified business conglomerate Mahindra Group, has been present in Saudi Arabia since 2006 catering to over thirty active customers. The company has a combined presence of over 1000 associates in the KSA (Kingdom of Saudi Arabia) including the team that came with the acquisition of Lightbridge

Communications Corporation (LCC) in November 2014. Some of Tech Mahindra's prominent customers in the country include the largest oil & gas companies, major petrochemical companies, one of the largest manufacturing group, leading banks and telecom companies. Manish Agrawal, Regional Head – Communications, Media & Entertainment Business, MEA, Tech Mahindra, said, "We are pleased to appoint Eng. Turki Alnader as the head of our Communications, Media & Entertainment business in the Kingdom of Saudi Arabia which is one of Tech Mahindra's focus market with MEA region.

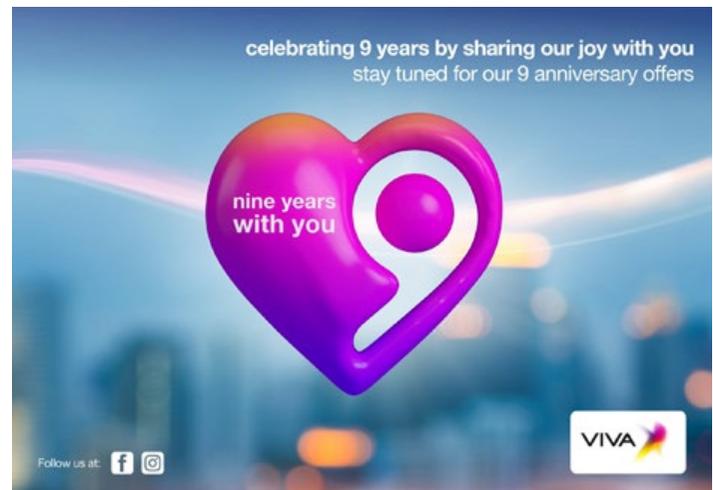
His rich experience and market knowledge will empower Tech Mahindra to grow our business in the region and enhance the partnerships with our key telco customers." Eng. Turki is a US educated industrial engineer and an accomplished senior management professional with 14 years of experience in the telecom and related businesses, overseeing programs & projects management, B2B sales, strategic planning and KPI (Key Performance Indicators) performance monitoring, financial and budgeting planning, network implementation and communications. Eng. Turki Alnader, Vice President Sales, for Communications, Media & Entertainment Business, Kingdom of Saudi Arabia, said, "I am excited to join a global digital transformation enterprise like Tech Mahindra, and look forward to leverage its expertise in the digital space to deliver next gen technology-enabled solutions and services in the Saudi market." As part of the TechMNxt charter, Tech Mahindra is betting big on next gen technologies like Artificial Intelligence, Block chain, Machine Learning, Cybersecurity and 5G. This move will enable Tech Mahindra to leverage these technologies and solve real business problems of its customers.



VIVA Bahrain Celebrates 9 Years of Success

Leading telecommunications operator in the Kingdom, VIVA Bahrain, is celebrating its 9th year anniversary since the launch of its operations with a spectacular range of promotions, offers and community-driven activities specially designed for this occasion. With celebrations kicking off on 1st March, the telecom operator planned several surprises throughout the weekend marking VIVA's big day on the 3rd of March, starting off with offering free 9GB data for all new prepaid and postpaid voice plan customers with 9 days validity, free 9GB data when registering on the VIVA App, and 225GB data with the new wireless fiber plan instead of GB140 for new subscribers registering from the 1st – 4th of March. VIVA will also be waiving the 5% VAT on the monthly bills for 9 months for all new postpaid voice plan customers and adding a free E-Sim worth of BD 9 to postpaid plans. Not only that, but VIVA will also be giving its customers 20% discounts on 9 Careem rides, 3 months free for new Anghami Plus subscribers, and a free "JBL GO2 Portable Speakers" when buying any smartphone from VIVA Online Shop. Additionally, starting 1st March, new subscribers to the VIVA Caller Tune will receive 9 days of free registration. Moreover, VIVA will be rewarding customers when visiting its Bahrain City Centre, Seef Mall, Hamad town and Gosi Mall outlets, where customers with tickets that feature the number '9' will be eligible to win up to BD100 VIVA Cash vouchers when they upgrade or renew their existing subscriptions or complete a Postpaid or a Prepaid transaction on either mobile or broadband plans. Customers contacting VIVA's Customer Care on '124', or through WhatsApp and Live Chat will also stand a chance to win BD5 VIVA Cash. And in the spirit of bringing joy to everyone, the weekend will also see the return of VIVA's popular 'Thank You Van' that will travel across the Kingdom to give away gifts at the press of a button, as well as celebrations taking place at a labour camp to mark

anniversary festivities with exciting gifts and surprises. Mr. Mohammad Al Khushail, Acting CEO at VIVA Bahrain, said: "Today we celebrate our 9th anniversary, and with it another year of accomplishments and successes. Our journey to reach where we are today took dedication and hard work, and it would not have been possible without the outstanding pool of talent that we have within the VIVA family. It's a privilege to operate in a country like Bahrain that puts innovation at the forefront and is keen to see the ICT industry grow and advance. The special offers we are introducing this weekend is our way of saying thank you to our customers for their unmatched trust and support throughout the years, and we promise them more great things in the future". Since its launch in 2010, VIVA Bahrain has been a major driving force in delivering true digital transformation across the Kingdom of Bahrain and has gone to great lengths to continuously innovate and bring digital solutions that offer both best in class service, and ultimate convenience to its customers.



VIVA Bahrain Delivers a Simpler Connectivity Experience with Gemalto's eSIM Management Solution

Gemalto (Euronext NL0000400653 - GTO), the world leader in digital security, has partnered with VIVA Bahrain, the Kingdom's telecom provider leaders, to supply them with a remote subscription management platform that enables customers to instantly activate a mobile connection for devices fitted with an eSIM. They will then be able to manage their mobile subscription throughout the product lifecycle, without ever needing to physically change a SIM card. In contrast

to a conventional removable SIM, an eSIM is embedded in the device during manufacturing. As a result, it saves space, reduces weight, and makes it far easier for OEMs to supply users with innovative connected devices wherever they are. In particular, eSIM adoption is helping to fuel dramatic growth in the IoT (Internet of Things), supporting the development of exciting consumer products such as smartwatches, connected PCs and compelling concepts that include the

connected car and smart home. In the wearables market alone, Frost and Sullivan predicts shipments in the Middle East and North Africa will reach 200 million units in 2020, up from 90 million in 2016. Gemalto's eSIM management platform provides VIVA Bahrain with seamless access to a cloud-based on-demand connectivity service that is fully compliant with the latest GSMA specifications. Customers will enjoy the best possible connected experience with eSIM-enabled devices, from the

moment they are switched on for the first time. "We continue to adopt innovative and latest trends in technology to enhance our customers experiences," said Karim Tabbouche, Chief Commercial Officer for VIVA Bahrain. "The adoption of Gemalto's eSIM remote subscription management

platform represents the latest stage of this on-going strategy, and builds on our already successful partnership." "With billions of machines and people now requiring round-the-clock connectivity, remote subscription management is key to an enhanced user experience," said Sherry

Zameer, SVP for IoT in CISMEA at Gemalto. "With the deployment of Gemalto's proven solution, Viva Bahrain is reinforcing its position at the forefront of the industrial and consumer IoT market."

Viva Bahrain, Etisalat Sign SmartHub Partnership



Viva Bahrain and Etisalat have signed a partnership to utilize Etisalat's state-of-the-art SmartHub to establish global connectivity that will further expand Viva's reach globally. Mohammed Al Khushail, acting CEO of Viva Bahrain, and Ali Amiri, Etisalat Group Chief Carrier & Wholesale

Officer, signed the agreement at the Capacity Middle East 2019, the largest Middle East meeting for global carrier community. Etisalat SmartHub is a carrier-grade data center that is strategically located at Etisalat submarine cable landing in Fujairah, offering seamless

regional and international connectivity. SmartHub is the ideal solution offering IX & IPX exchanges for carriers and content providers, as well as mobile network operators delivering high performance and reliability, a statement said. Al Khushail said: "Viva is honored to sign this strategic partnership with Etisalat. Such agreements are important milestones to our global expansion strategy where we strengthen Viva Bahrain's position as a dynamic carrier with global reach. This partnership will enable us to connect directly with tier 1 international carriers, reinforcing our global reach and international services portfolio to better serve our business customers around the world." Amiri said: "Etisalat is honored to have added yet another major telecom services operator into our expanding portfolio of customers, and we look forward to a continued long and mutually beneficial relationship with Viva Bahrain. This partnership will add greater value to the SmartHub platform further enriching our global network and connectivity propositions."



Thuraya (A Subsidiary of Yahsat), IEC Launch Maritime Satellite Service

Thuraya Telecommunications Company, a subsidiary of the Al Yah Satellite Communications Company (Yahsat), said that its ground-breaking maritime satellite service, Thuraya VSAT+, is now commercially available from IEC Telecom. As the master distributor for VSAT+, IEC Telecom will serve all main maritime market segments and customers, including high-end fisheries, offshore installations and merchant fleets. In a win-win partnership for both companies and

the maritime industry, IEC Telecom will offer VSAT+ across Europe, Asia-Pacific (APAC) and Middle East and Africa (MEA). IEC Telecom has been a leading provider of value-added voice and data services to the maritime industry for more than 20 years and was awarded best Maritime Thuraya Service Partner in 2018. Thuraya launched VSAT+ in Q4 2018. The service offers global coverage, best-in-class data rates to meet growing demand for high-throughput services, and high levels of reliability,

security, resilience and flexibility. VSAT+ ensures optimum flexibility by combining Ku-band (for high-speed data) and L-band (for backup and fall back). The service is scalable to meet global and regional needs for essential communications such as voice calls, email and position reporting, and for high-bandwidth requirements such as training, publications, condition-based maintenance, enterprise resource planning and content for crew welfare. Nadeem Khan, Director Maritime M2M

& IoT at Thuraya, said: "By appointing a highly experienced, capable partner with wide geographical reach as our Master Distributor for VSAT+, we are simplifying the proposition for resellers to offer high-quality services with no investment in the infrastructure. This is a win-win partnership founded on creating new opportunities for the maritime industry." Nabil Bensoussia, General Manager IEC Telecom, said: "Last year IEC Telecom Group was recognized as the best service provider for Thuraya Maritime Solutions. This award came at a significant period, when the industry is rapidly evolving under the influence of new technologies. Launch of Thuraya VSAT+ marks the beginning of a new chapter in

the IEC Telecom and Thuraya relationship. Together we have potential to transform the market of maritime communications." In support of the Thuraya VSAT+ service, IEC Telecom developed the OneGate smart solution, which is available for marine and offshore applications. OneGate offers users unparalleled visibility over communication assets to facilitate control over critical operations and maintain reliable connectivity where it matters the most. Nabil concluded: "Enhanced by a set of value-added services from IEC Telecom, Thuraya VSAT+ is a truly unique solution for maritime communications. For a couple of years, our teams worked side by side to deliver an affordable service

able to address specific requirements of all vessel types. The mission has been successfully accomplished. For international shipping companies, Thuraya VSAT+ offers global coverage with no yearly lock-in commitment. For fishing and leisure boats, we provide flexible tariff plans with regional focus." Customer demand is constantly growing for satellite solutions that offer high-speed internet, always-on connectivity, ease of use, innovation and value-added features that drive operational efficiency and increase on-board options for entertainment and crew welfare. VSAT+ and IEC Telecom's value-added services meet this demand in an integrated solution.

Thuraya VSAT+^{PLUS}
Integrated maritime platform
of Ku-band & L-band

THURAYA MARINECOMMS

THURAYA MARINECOMMS

Thuraya VSAT+

IEC telecom



Zain SA Acquires 5G Spectrum in the 3500MHz Band

Zain Saudi Arabia has acquired 100MHz of spectrum in the 3500MHz band at a total value of SAR624 million (USD166 million), to be paid in equal instalments starting from 1 January 2022. The frequencies

(with 15-year validity) will be available for 5G use from 1 January 2020, with Zain saying that it will finance the acquisition of the new spectrum via its operational cash flows and current cash reserves. Following

the award, the company's total spectrum holding will include frequencies in the 800MHz, 900MHz, 1800MHz, 2100MHz, 2600MHz and 3500MHz bands.

Zain Saudi Arabia Teams Up with Nokia to Provide Innovative IoT and Enterprise Solutions in the Kingdom

Zain Saudi Arabia (Zain KSA) and Nokia signed two important Memorandum of Understandings (MoUs) at Mobile World Congress 2019 in Barcelona that will enable Zain to quickly launch IoT services and applications and provide innovative end-to-end solutions to enterprise and public sector segments in the Kingdom. The collaboration will help Zain KSA to further its digitalization initiatives to transform Saudi Arabia in line with the National Transformation Plan 2020 and Vision 2030. Zain KSA and Nokia will work together to provide the Kingdom with the latest innovative solutions including IoT, cloud services, security applications, and reliable and high-speed network connectivity solutions. By using Zain KSA's existing infrastructure and network connectivity that spans the entire Kingdom coupled with Nokia's innovative solutions, the mobile operator is able to digitalize its services, increase agility and be fully secure with optimized CAPEX and OPEX investment. These initiatives will unlock opportunities in helping the Saudi public sector and enterprise segments to grow, boost revenue and provide high-quality services to their respective end customers. As part of the first MoU, Zain KSA will leverage Nokia's Worldwide IoT Network Grid (WING) to launch IoT services and the two companies will work towards the development of a strong IoT ecosystem in the country. Nokia's WING platform allows operators to quickly launch new IoT services and applications for enterprise customers, a capability enhanced by four new vertical applications launched in advance of Mobile World Congress 2019. Nokia's WING platform provides managed services for IoT and allows service providers to launch IoT

services with minimal investment in the infrastructure. The two companies will also explore joint marketing for the IoT solutions and ways of accelerating the IoT partner ecosystem. According to the second MoU, Zain and Nokia will partner to provide innovative enterprise solutions including radio, cloud, IoT and security solutions to enterprises from different verticals, such as public safety, aviation, energy, transport, healthcare and water. Eng. Sultan Abdulaziz AlDeghather, CEO of Zain Saudi Arabia, said: "Accelerating our IoT and smart cities initiatives through Nokia's superior IoT platform, WING and ancillary professional services, will enable us to build a modern IoT infrastructure and provide services to improve productivity and lifestyle comfort. We will collaborate to explore new business models, technical requirements and use cases for the launch of IoT services." Eng. Saad A. Al-Sadhan, Chief Business and Wholesale Officer, Zain Saudi Arabia, said: "Businesses now demand technology solutions that enable them to digitalize their operations and reduce their operational expenses

while enhancing their productivity. This partnership will allow us to create innovative and secure solutions for our enterprise and public sector customers, which will help us deliver superior services and increase our revenue. This is also in keeping with the National Transformation Plan 2020 and Vision 2030 to build a thriving business environment." Ali Jitawi, head of the Zain Saudi Arabia customer team at Nokia, said: "These two important MoUs pave the way for the acceleration of Zain KSA's digitalization efforts toward transformation of Saudi Arabia. We look forward to working with the operator to support them in creating IoT use cases and applications for its enterprise subscribers. Further, the enterprises, both large and small, want to use the latest technologies to enhance collaboration and bring down their operational expenditure. Our world-class and proven products along with Zain KSA's robust network infrastructure is a winning combination to address the demands of the enterprises in the country." 



ARTICLE

Digital Services: An Enabling Framework

We are living in an era, which has created enormous opportunity and potential for economic- and socio-economic development and growth, for wealth-creation and prosperity and human development. At the end of 2018, we passed the critical 50/50 milestone for Internet use: now, more than 50% of the world's

Digital services can clearly help drive demand and thereby connectivity. But how can digital services flourish? The article briefly looks at the context and definition of digital services and examines what enablers in the policy, legal and regulatory space need to be in place, and what SAMENA Telecommunications Council is doing to help drive the emergence and proliferation of meaningful digital services.

population uses the Internet. Yet, digital divides persist, and inequalities continue to affect progress towards the economic and social development of different regions, countries, households and individuals. Therefore, more efforts are required based on bold, new and different approaches to connect the remaining 49 per cent of the world's population. Numerous studies have looked at the key Internet adoption barriers and most studies conclude that while infrastructure gaps are still a key reason for being offline, including supporting infrastructure such as power, it is the demand-side barriers including the lack of capability (ICT skills and know-how and basic literacy), the lack of affordability (service and device costs as well as costs of electricity for e.g. recharging and taxes), and, in particular the lack of relevance, meaning locally relevant content, services and apps, that should be given increased attention. New approaches may therefore include sharing approaches (network infrastructure, expertise, data...), partnerships (governments, private industry, investment agencies, academia) and innovative financing models to support both network roll-out and service uptake, with a particular focus on demand-side barriers to tackle the lack of capability, affordability and relevance.



Imme Philbeck

Chief Economist and Director Sector Development
SAMENA Telecommunications Council



In this context, governments as well as network operators have been quick to recognize the opportunity that digital services can represent: they can help address local demand-side Internet adoption barriers such as capacity, relevance and affordability; support meeting national transition plans and economic visions to address the most pressing urban and rural challenges; or they can provide an opportunity for network operators to diversify along the digital value chain and offer a broader set of new advanced services based on evolving technologies and network infrastructures. Digital Services are typically extremely cost effective, as they have no substantive dependence on staff or real estate and they are also typically more than just informational and offer new, or improved, transactional capabilities and transfer responsibility or control of service use away from the provider to the citizen or customer. As regards their provision mechanisms, while digital services can constitute bespoke local solutions, their underlying deployment models can have global dimensions, where elements of the value chain can be spread across different countries and regions, as otherwise service provision in smaller, local markets can be uneconomical.

Digital services can clearly help drive demand and thereby connectivity. But how can digital services flourish? The article briefly looks at the context and definition of digital services and examines what enablers in the policy, legal and regulatory space need to be in place, and what SAMENA Telecommunications Council is doing to help drive the emergence and proliferation of meaningful digital services.

Proliferation and definition of digital services

A wide variety of digital services has proliferated globally across the public and the private sectors over the last 20 years. They span from public citizen services in, for example, the areas of travel assistance, work & retirement, tax, vehicles, residence formalities, education & youth, family, health and consumers, to public business services including VAT & customs and public contracts. There are commercial services to consumers,

including communication services, video & entertainment, location-based or lifestyle services, mobile financial services, to name but a few; and there are enterprise services including information security, enterprise mobility management, unified communications, cloud services including storage, processing and analytics, services that are delivered through telco-industry partnerships and platforms to end-customers of other industry sectors (e.g. B2B2X), and many more. An increased scope for digital services is also emerging with the roll-out of 5G infrastructure, enabling enhanced greater speed broadband (to move more data), lower latency (to be more responsive), and the ability to connect a lot more devices at once (for sensors and smart devices (IoT)).

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Given the above, digital services can have many definitions, depending on the context or perspective, the function or domain that is considered (e.g. tax purposes, market definition, consumption, marketing,

position along the value chain). However, based on various definitions available¹, the core commonalities of digital services can be identified to include (a degree of or full) automation, delivery over the Internet or an electronic network, the use of information technology, and transfer of responsibility or control of service use away from the provider to the citizen or customer. In the context of the reference framework, it is important to adopt a dynamic definition that is broad enough to capture the whole breadth of services available and flexible enough to allow future development and evolution of services based on different and emerging technologies. The definition therefore needs to be forward looking and technology neutral and avoid hard distinctions based on current value chain positions of different service providers.

Key enablers for a thriving digital services ecosystem

Last year's WSIS High Level Track on ICT Applications and Services acknowledged that ICT applications and services are fundamental to the advancement of a countries' progress in contributing to the achievement of the SDGs and must derive from a cohesive ICT policy. Participants concluded that in order to foster ICT applications and services to emerge, appropriate enablers need to be in place, including the provision of access to connectivity and the facilitation of ease of public services engagement and doing business through introducing targeted ICT Policies that are based on country priorities. In this regard, SAMENA Council stressed that a reference framework for digital services was needed, which sets out key policy, legal and regulatory enablers.



During the UN Broadband Commission's Thematic Workshop "Trusted universal connectivity and innovative partnerships to drive inclusive digital transformation" at UNCTAD's 2019 eCommerce Week in Geneva, SAMENA Council emphasized on the importance that such a framework should reflect a broader than national scope and include key elements such as (1) an overall digital strategy; (2) an enabling approach to the use and protection of data; and (3) an enabling mechanism for cross-border data- and content flow.

To this effect, SAMENA's Working Group on Digital Services is in the process of creating a high-level policy-, legal-, and regulatory ("PLR") reference framework for digital services to (1) provide a clear overview of key policy / regulatory blocks needed with the ultimate aim to achieve a level playing field for all ICT stakeholders to provide digital services, and (2) identify the best governance model, i.e. at what level, within what type of structure, and which body can drive, implement and monitor the proposals. This framework, once finalized, can provide high-level guidance to governments and regulatory authorities across the SAMENA region (and beyond) in creating a thriving and supportive digital ecosystem that drives the development and emergence of innovative and meaningful digital services. It can support national gap analyses against a set of possible enablers that

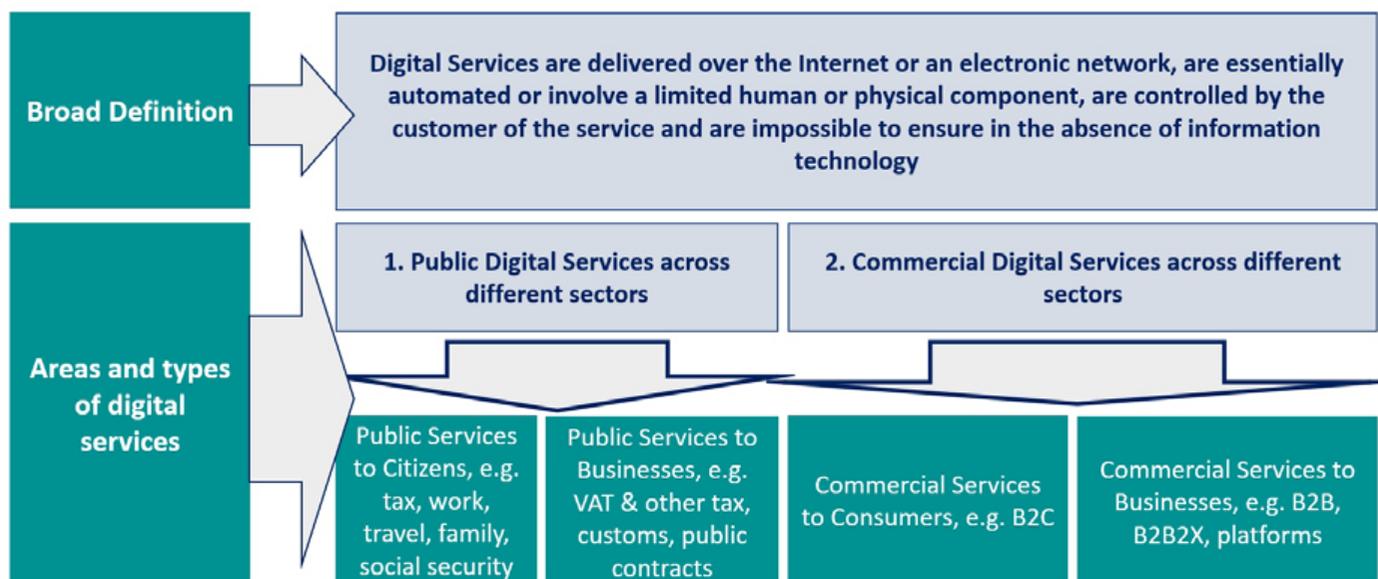
need to be evaluated in the national or regional context. Given that digital services can span across different jurisdictions, sectors and value-chain stakeholders and essentially hinge on scale, the challenge lies in creating a governance and reference framework that is built on horizontal principles and converged and harmonized standards, policies and regulations, and that can extend across borders, but that also fosters local value creation.

In its draft format, the SAMENA PLR digital services reference framework comprises four levels, including (1) a National Digital Agenda informed by National Transformation Plans / Economic Visions; (2) key policies and frameworks that constitute the National Digital Agenda and provide the structure for transformation, (3) laws that enforce the policies and frameworks, and (4) regulations and guidelines that implement the laws, policies and frameworks. The key enabling blocks at the policy level, together with their supporting laws, regulations and guidelines, are proposed to cover a framework on overall digital services provisioning, comprising frameworks on cross-sector licensing, harmonized spectrum, management of cross-border data flows, cybersecurity and penalties for cybercrimes, and legitimizing online transactions through electronic authentication and corresponding internationally recognized

standards (personal ID, documents and sources). Also, such a framework should include horizontal policies in the areas including competition, taxation, and data- and consumer protection, and an allocation-based licensing mechanism with conditions and obligations. Such obligations should not be stringent or prescriptive as regards, for example, quality of service or national coverage, to ensure that innovative uses are not curbed.

To ensure that such a framework is effective and useful, it has to include a governance component, including a structure and mechanisms. A governance structure and mechanisms are key to ensuring that policies and their implementing laws and regulations are executed, and that qualitative evaluation of progress in the proliferation of services is possible. For example, while 156 countries have adopted national broadband plans ("NBPs"), the Expert Group to the UN Broadband Commission finds in its report "A new Deal: Investing in our common future – Policy recommendations to close the broadband gap" that the impact of NBPs is limited, because the right governance structures to undertake, e.g., qualitative evaluation of progress in execution of policies included in NBPs are missing. Therefore, the framework also considers governance components to be included. Moreover, given the - in part - often global or regional nature of deployment models of digital

Figure 1: Definition and Overview of different types of Digital Services



Source: SAMENA Council

services, the framework proposes that such a governance structure should extend across borders and sectors and may entail the setting up of digital commissions or public online platforms as key governance elements.

Figure 1 shows a high-level conceptual illustration of the key components that should be included in a digital services reference framework.

From a policy perspective, SAMENA countries, especially in the GCC region, are largely on track, having adopted Economic Visions and Digital Agendas with horizons up to 2040, that set out key objectives and steps to be taken to further digital transformation toward building Digital Economies. These include, for example, Saudi Arabia's Vision 2030, UAE 2021-2030 Vision, Oman Vision 2040, Jordan 2025², and others. Moreover, efforts are being made in reviewing and adapting current regulatory frameworks, including on topics such as general competition law, consumer protection and data privacy, and introducing new regulatory frameworks

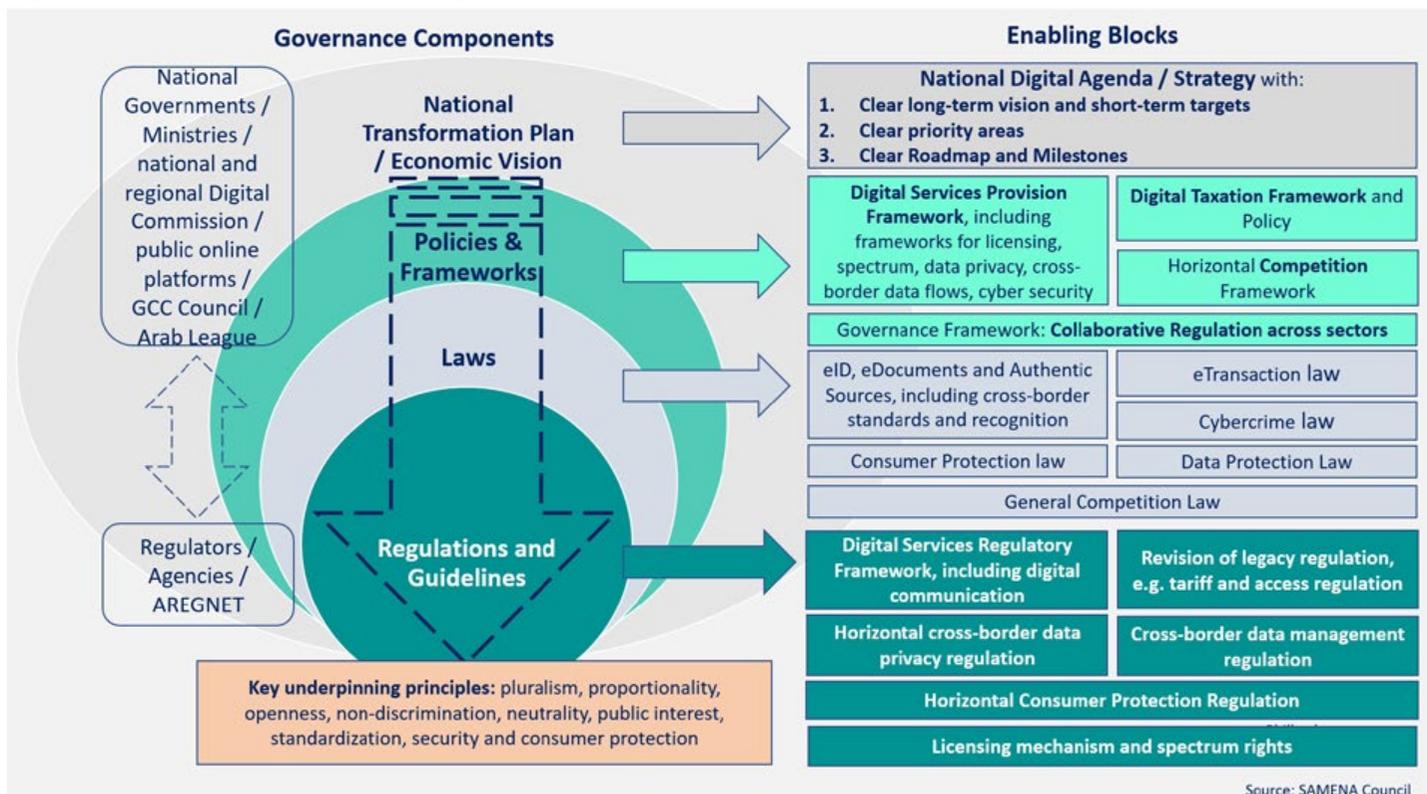
with regards to e.g. cloud services or IoT.

However, more needs to be done in order to allow and facilitate, e.g., telecommunications operators to lay the groundwork for digital services provision, including upgrading their networks and rolling out 5G capabilities, transforming and scaling their operations beyond national boundaries through virtualizing their networks to offer digital services with the help of remote service provisioning, which may, for example, include the storing and processing of personal data outside the home country. While digital services can constitute bespoke local solutions, their underlying deployment models can have global dimensions, where elements of the value chain can be spread across different countries and regions, as otherwise service provision in smaller, local markets can be uneconomical. This is particularly important in the context of some of SAMENA's sub-regions, such as the GCC, where market sizes are relatively small. Other impediments include legacy standards and regulation, narrow licensing requirements (siloe approaches), strict

national data localization requirements or the absence of a cross-border approach to data privacy and -management, as well as the lack of coordinated cross-border cybersecurity approaches. Therefore, global dimensions need to be reflected in a digital services governance and regulatory framework to facilitate a thriving digital services ecosystem that can support the achievement of national transformation plans and economic visions.

With the creation of a reference framework for digital services, which will be published in due course, SAMENA Council takes a step that can help focus efforts better in terms of industry priorities, and enhance or accelerate co-operation building efforts not only between the private and the public sectors, but also shift the focus to adopting a broader than national view when it comes to digital services ecosystems, that do not stop at national borders for most countries. As highlighted above, digital services deployment models hinge on scale and may therefore be broader in scope. Governance and policy frameworks in the digital age need to reflect this too. 🌍

Figure 2: PLR Reference Framework for Digital Services



¹ See: Article 7 of the COUNCIL IMPLEMENTING REGULATION (EU) No 282/2011 of 15 March 2011 laying down implementing measures for Directive 2006/112/EC on the common system of value added tax, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011R0282&from=EN> ; EU GDPR definition of information service: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32015L1535>; EU electronic communications service definition: https://eur-lex.europa.eu/summary/glossary/electronic_communications_services.html ; Lea&Cox Associates definition: <http://esmarchitecture.com/key-concepts/business-it-digital-services.html> ; Cisco's definition of a public digital service: https://www.cisco.com/assets/global/UK/public_sector/new/pdfs/DigitalPublicServicesWebSinglePageV1.pdf

² See: <http://www.jordanembassyus.org/blog/jordan-2025-national-vision-and-strategy>

REGIONAL NEWS

UAE Launches New Child Digital Safety Initiative

Deputy Prime Minister and Minister of Interior Sheikh Saif bin Zayed announced the launch of a Child Digital Safety initiative to help protect children from online threats. Sheikh Saif said the new scheme was an essential part of government efforts to raise awareness among children of the dangers of the internet. The program aims to instil "positive values and behavior" as youngsters learn to explore social media platforms and the web. Authorities said its introduction would empower children, assist social cohesion and help raise a new generation of digitally savvy users. "The UAE leads the world in terms of internet and smartphone penetration and this calls for developing a sophisticated digital safety net for our children," Sheikh Saif said. "The UAE Government is committed to maintaining family stability and social cohesion, and children are at the top of its agenda. Their safety is key for promoting overall well-being in the UAE, maintaining social stability, empowering positive and active citizens, and raising generations with a firm grasp on the digital world." In 2018, a study by Norton Cybersecurity revealed that parents in the UAE lacked the experience to deal with their children's online activities. Nearly 90 per cent of parents said their children spent too much time on the internet, while 31 per cent said their children were bullied online. The study also revealed that 66 per cent of families said they put no controls in place to limit children's online access. The average time spent online per person each day in the UAE is eight hours, with three of those spent on social media. On Friday, the new Child Digital Safety initiative was launched together with Ohoud Al Roumi, the UAE's Minister of State for Happiness and Wellbeing. It came on the same day the UAE marked Children's Day that coincided with the anniversary of Wadeema's Law, legislation to help protect young people. The new scheme will seek to protect children with four programmes. The first, an interactive children's camp, will teach five to 18-year-olds how to safely use the

internet and social media. The second, known as a "digital well-being portal" will provide tools and information to help parents face the challenges of the digital world. Meanwhile, the third and fourth elements to the strategy will consist of training workshops for both parents and teachers, as well as a support platform where people with questions on digital safety can speak to experts. "Enhancing digital wellbeing is essential for promoting overall wellbeing in the wider community, and online safety is a key component in that regard," Ms. Al Roumi said. "To ensure

safe and secure access to the internet and smart applications, individuals need to be made aware of these threats and be well-equipped to address them. "Establishing a safe digital environment for children and empowering them to securely use technology reflects positively on the wider community and its wellbeing. "This new initiative is a powerful instrument for instilling positive values and behavior among our children and guiding them to safely explore the internet and social networking platforms."



Child Digital Safety

UAE leads the world in a number of digital consumption indicators



Selected Reported Digital Behaviors in the UAE



Saudi Arabia Ranked among Top Global Players in Tackling Cybersecurity

Saudi Arabia has been ranked top Arab nation and 13th in the world for its commitment to cybersecurity. The Kingdom has shot up 33 places in the Global Cybersecurity Index (GCI) league table since standings were last published by the UN International Telecommunication Union (ITU) in 2016. The ITU, the UN's specialized agency for information and communication technologies, uses specific criteria to measure the performance of 175 countries in tackling cybersecurity

at a global level. King Salman and Crown Prince Mohammed bin Salman have given major support to the sector, establishing the Saudi National Cybersecurity Authority (NCA) to focus primarily on computer security. In a statement, the NCA said it was working with relevant bodies around the world on sharing knowledge and had launched a number of significant initiatives and projects which have contributed to enhancing cybersecurity in the Kingdom. It expressed thanks for

help from various agencies including the Saudi Communications and Information Technology Commission, the ITU's Kingdom representative. The ITU updates the GCI every two years based on five main pillars of measurement: legal, cooperative, technical, managerial and capacity-building. By creating the index, the ITU aims to improve international cybersecurity and promote the exchange and sharing of experiences between member states.

Smart Cities Drive GCC's Smart Grid Market

Smart cities are driving the GCC's smart grid market to US\$33 billion by 2042, said Schneider Electric, a leader in digital transformation, ahead of Middle East Electricity in Dubai, UAE. GCC nationwide digital transformation and smart cities are weaving energy efficiency throughout every project – across renewable energy generation, more efficient power distribution using the Internet of Things and Big Data analytics, and making smart buildings more energy efficient. One of the region's biggest opportunities is in governments launching smart grids between countries to boost cross-border electricity trade. Over the next 25 years, GCC smart grid inter-connectivity could drive \$33 billion worth of investments, according to a recent report from Ventures Onsite. "Arabian Gulf governments are investing in energy efficiency for Smart Cities to optimize energy costs, foster economic growth, and meet the rising power needs of residents and industries," said Hanan Darwish, cluster president – Gulf and Pakistan, Schneider Electric. "Smart Cities should first invest in operational technology to enhance existing performance and to integrate into emerging technologies." In the region, Schneider Electric is exchanging best practices in smart cities and energy efficiency from Naya Raipur, India's first Greenfield Smart City. Naya Raipur's Command and Control Center leverages the Schneider Electric EcoStruxure architecture to unite 100,000 connected products across energy and water management, building management, and government apps for real-time insights. "Middle East Electricity presents a major opportunity to emphasize to Smart Cities players that they need to integrate three layers for success," added Darwish.

"Smart Cities need the operational technology foundation of smart panels and transformers, the middle layer of connected devices with edge control self-management, and the top layer of real-time insights that can optimize services." In the coming years, industry experts see strong potential for smart cities to integrate emerging technologies such as the Internet of Things, artificial intelligence and machine learning, and blockchain to transform the energy sector. For example, the Internet of Things can enable Smart Cities to pinpoint energy loss in a smart grid, artificial intelligence can allow power providers to predict energy usage peaks, and blockchain can ensure that electricity trade is safe and secure.



Egypt Plans to Revise Building Code to Extend Fiber Coverage

The Egyptian government has resolved to connect all new buildings and residential homes in the country with fiber optic cable and seeks to revise the building code to include the communication networks code, which has standard specifications

for communications infrastructure. ICT Minister Amr Talaat said the move is part of efforts by the Ministry to develop internet services and boost speeds across the country. The Ministry announced that Talaat said priority will be given

to the development and modernization of infrastructure and communication networks, to serve the transition to a digital society.

UAE and Saudi Arabia Emerging as Regional 'Tech Powerhouses'

The UAE and Saudi Arabia show the most promise in terms of skills in technology, according to the Coursera's Global Skills Index, an in-depth report on skill trends and performance across 60 countries in the Middle East and around the world. "The UAE shows the most promise in Technology (#40) compared to Business (#52) and Data Science (#38). This may be a reflection of the UAE government betting big on AI and fostering a testing ground for robotics," the report stated. "Saudi Arabia ranks higher in Technology (#50) compared to Business (#58) and Data Science (#58). Its strong performance in Human-Computer Interaction (92%) is likely a reflection of the government's investment in digitization," it added. "Although there's been a significant increase in education investment in recent decades, MEA students still aren't graduating with the right skills, as the 31% youth unemployment rate indicates." While they are on the right track, and are regional powerhouses, results show that the UAE and Saudi Arabia still have work to be done in order to catch up with countries with cutting-edge skill sets in technology, business and data science such as Spain, Austria and Switzerland. Ahead of private sector expansion, business will be a key area for improvement in the UAE and Saudi Arabia. The UAE's lowest performing domain is business and it ranks #52 globally and #4 in the region. Saudi Arabia also ranks lower in business at #58 globally and second to last in the region. It lags the most in accounting and marketing (2%). Upskilling in business will be key areas to the region's goals for private sector expansion. "As the countries shift their industrial base away from natural resources, they must focus on building a knowledge-based economy that's driven by a highly skilled workforce. The development of technology and data science skills, in particular, will continue to emerge with the adoption of new-age technologies such as Internet of Things, Artificial Intelligence and blockchain, underpinned by the

UAE Vision 2021 and Saudi Arabia Vision 2030, respectively," the findings stated. Finland, Switzerland and Austria round up the top three worldwide respectively in terms of business skill sets, which include accounting, marketing, finance, sales, management and communication. Saudi Arabia, Bangladesh and Egypt, however, sit as the bottom three respectively. Argentina, Czech Republic and Austria sit as the top three worldwide respectively in terms of technology, while Kenya, Pakistan and Nigeria round up the bottom three. Technology skill sets studied include computer networking, operating systems, human computer interaction, databases, security engineering and software engineering. In terms of data science worldwide, Israel, Switzerland and Belgium are rated as the top three worldwide respectively, with Saudi Arabia, Pakistan and Nigeria sitting at the bottom three. Data science skills include math, statistics, machine learning, data management, statistical programming, and data visualization.



PTA Enriching the Mobile Ecosystem; Curbing Counterfeit Mobile Devices

In order to facilitate the general public and, as per Telecommunications Act 1996 & Regulation, Pakistan Telecommunication Authority's (PTA) mandate is to ensure that mobile devices being imported conform to technical standards

laid down by international standardization bodies and do not pose any health or frequency issues in licensed spectrum being used in Pakistan. Moreover, contrary to certain media reports, PTA has not imposed any restriction on import of mobile devices (new or used). In light of Federal Cabinet decision, PTA complied with the directives and Type Approval Regulations, DIRBS regulations & SOP were amended. Accordingly, all entities planning to import a type approved model (new or used) can do so from ease of their location by submitting documents via PTA online mobile device registration system (<https://www.dirbs.pta.gov.pk/drs>). This is done to create ease of doing business for all and enabling them to apply via automated system. It is also clarified, that Groupe Speciale Mobile (GSMA) is not an approving authority on mobile phone bodies. It is an international organization to which manufacture applies for issuance of Type Allocation Code (TAC). Detail of approved models is available on PTA website and updated periodically. For further information, visit: <https://www.pta.gov.pk/>



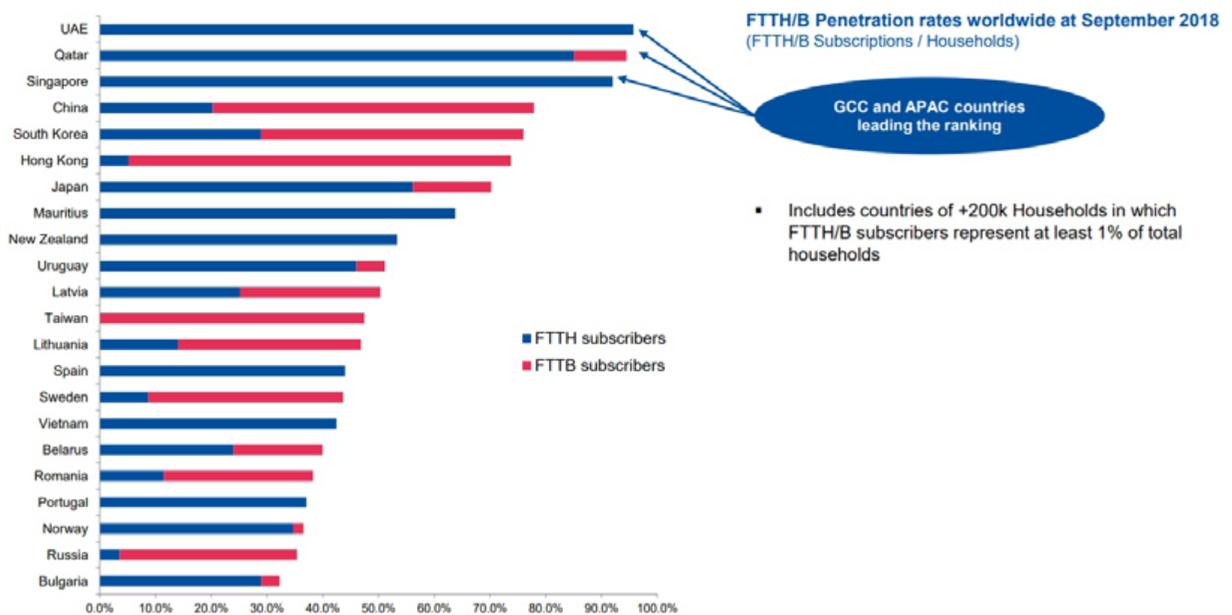
UAE Ranked as Global Leader in Fiber Optic Network for a Third Year in a Row

UAE is ranked number one for the highest Fiber to the Home (FTTH) penetration among all its global counterparts for a third year in a row, according to the leading industry body FTTH Council. The council published its annual report that showcases the countries with the highest fiber optic network penetration globally. The report highlighted UAE as the number one country globally with its fiber network coverage surpassing Singapore, China, South Korea, Hong Kong and Japan. Etisalat's network is a backbone to its long-term strategy to enable and drive digital transformation across its network. Today's announcement signifies that it has maintained consistent leadership globally in FTTH penetration setting a benchmark in the global telecom industry.

This achievement was only possible due to the continuous support and vision of the leadership of UAE in the development and modernization of the infrastructure. Etisalat plans to invest AED 4 billion during 2019 in digital transformation, the mobile and fiber network. This has led to the launch of innovative services meeting the growing demand and changing requirements of Etisalat's customers across the country. With Etisalat's strategy focused on 'Driving the Digital Future to Empower Societies' the network forms a significant component of this digital transformation journey. Etisalat has continuously focused on investing in innovation and on next generation technologies and services to expand and enhance the network. In today's connected world, with the greater need for computing

and connectivity capabilities such as an advanced network also enables the implementation of futuristic technologies like augmented reality, robotics and artificial intelligence. Consumers are able to experience high performance and capabilities required in advanced gaming, streaming, applications and entertainment with a high-speed network. For enterprises, digital transformation will play a pivotal role in enabling the support of advanced use cases, applications and technologies. This will be key to bring success and next level of development leading Etisalat to play a greater role in digital lives of consumers and enterprises. This forms the backbone of a robust and one of the most advanced and fastest network in the region

Global Ranking at September 2018 – Mature markets



NTRA Egypt Hosts “5G Roadshow” Workshop with the Attendance of Experts from Nokia

NTRA, represented in R&D Department, hosts a workshop titled “5G Roadshow” at NTRA's premises in Smart Village. This event was attended by international experts from Nokia during their visit to Egypt. The

session focused on the business side of 5G technology and use-case aspects as experts can share their thoughts and experiences about new technology trends. The workshop dealt with three pivots:

5G Services (use cases) in the public sector and enterprises, experience from developed markets and 5G contribution to economy.

Digital Nation 6 Showcases Latest Developments in ICT Sector in Egypt

The 6th round of the annual conference of the Chamber of Information Technology and Communications (CIT) 'Digital Nation 6', has launched with the participation of the Minister of Communications and Information Technology, Amr Talaat, and the Minister of Investment and International Cooperation, Sahar Nasr, and the CIT Chairperson, Waleed Gad, and around 100 ICT investment companies. The conference includes an exhibition for large, medium, and micro enterprises, organizing a series of seminars and workshops on new technologies, and arranging a number of competitions to promote creativity and innovation within companies. 'The valuable Digital Nation forum reflects the goals we seek to achieve,' said Talaat during his inaugural speech. He referred to his meetings with a number of government officials and international ICT companies during the Mobile World Congress in Barcelona last week. He highlighted that the ICT sector grew by 14% in the first quarter (Q1) of the current fiscal year, followed by a growth of 16% in Q2. Talaat stated that work is proceeding in the projects of automating 25 main services, with each including a group of subservices, making a total of 100 major services and subservices to cover all the needs of citizens. This will be launched within a

year in Port Said as a first stage. Talaat also added there is a current governmental strategy to endorse developing the calibers in the ICT sector with the latest and most advanced knowledge, and help the state sectors achieve the digital transformation. The minister also referred to the initiatives which the ministry implemented in capacity building, and aimed to support technological innovation and entrepreneurship, such as 'Fekretak Sherketak'. The initiative 'Fekretak Sherketak' received and examined 600 start-up applications, 60 of which will be

supported and introduced to business accelerators, while encouraging investors to implement joint projects with them. This is in addition to the 'Wazeefa Tech' initiative, implemented in cooperation with Nasser Social Bank to prepare calibers specialized in modern IT, targeting 1,500 young people in its first phase. Moreover, a digital academy was launched to provide young people with free interactive training in Arabic in nine different IT specialties, having 100 hours recorded so far.



Saudi Arabia Poised to Become the Largest Digital Market in MENA

Eng. Abdullah bin Amer Al-Swaha, Minister of Communication and Information Technology, disclosed that the Kingdom of Saudi Arabia is moving forward to get transformed into a digital economy, adding that the state's institutions managed to use the latest technology of the Fourth Industrial Revolution, the Saudi Press Agency (SPA) reported. He added that the IT market in the Kingdom with the latest IT services, software and equipment reached about \$12 billion, while the emerging technology market stood at \$10 billion, placing the Kingdom among the world's

most developed markets. On the sidelines of the Mobile World Congress (MWC) being held in Barcelona, Spain, Eng. Al-Swaha affirmed that the Kingdom aims to become the largest digital market in the Middle East and North Africa, adding that a contribution of Smart Cities' projects to Gross Domestic Product (GDP) is expected to reach about \$2 billion by 2030. According to SPA, he highlighted the Kingdom's success of the crowd management through adapting technology to serve guests and visitors of the Two Holy Mosques. Eng. Al-Swaha said that the solid infrastructure of the

Kingdom's communication sector has enabled the health sector to improve and provide many benefits that have saved time and effort, pointing out that the health sector will contribute with about \$500 million to the GDP by 2030. He stressed that the expected economic impact of the Fourth Industrial Revolution in the Kingdom is estimated at \$4 billion by 2030. He added that the ministry has built the latest solutions and technological applications yielded by the Fourth Industrial Revolution to achieve objectives of the Kingdom Vision 2030, SPA reported.

Pakistan Ranks 1st for Affordable Telecom Services

Pakistan has been ranked number one for the provision of most affordable telecom services amongst 139 countries. According to World Economic Forum's Network Readiness Index Report, Pakistan is ahead of India, Bangladesh and Sri Lanka in the South Asian region, which are

ranked at 8th, 14th and 35th respectively. Furthermore, Competitiveness Index Report of World Economic Forum has also ranked Pakistan above India, Bangladesh and Iran in terms of availability of latest technologies and internet bandwidth, says a press release issued by Pakistan

Telecommunication Authority (PTA) on Saturday. It may be noted that World Economic Forum is regarded as one of the most reputed, credible and authentic source of information globally.

PTCL Builds 100G Optical Network in Pakistan

Nokia has deployed 100G in Pakistan Telecommunication Company Limited's (PTCL) network to enhance the capacity and speed of its optical network for both domestic and international traffic. The new transport network supports PTCL in providing faster and more reliable services to its subscribers, while reducing capital and operating costs. PTCL is able to flexibly increase network capacity and efficiency with the Software Defined Network (SDN) capabilities of the Nokia optical solution. This allows the operator to meet surging traffic demands caused by the increasing use of high-bandwidth services and applications such as HD and 4K video by individuals, and cloud by webscale companies. Nokia 500G DWDM line card and flexgrid technology provides investment protection for PTCL with an

instant upgrade to 200G and 400G per wavelength for flexibly meeting growing bandwidth demand. By using PTCL's extensive fiber footprint, Nokia DWDM network provides multipath redundancy against multiple fiber cut and hence ensuring higher network availability SLAs. The Set-Partition Quadrature Phase Shift Keying (SP QPSK) modulation is utilized to efficiently cover very long distance links which not only offers excellent Optical Signal-to-Noise Ratio (OSNR) tolerance but also 30% improvement in latency over PTCL network due to less regenerations. Furthermore, the new optical network makes it easier to launch new services based on the ROADM (Reconfigurable Optical Add-Drop Multiplexers) technology, which adds flexibility and agility to the network. Saad MWaraich, Chief Technology

& Information Officer, PTCL, said: "We are committed to providing a world class network experience to our subscribers and this deployment is a significant step in that direction. Nokia's state of the art optical network technology and their expertise will help us to differentiate our portfolio as we provide our business and consumer subscribers with faster and more reliable broadband and carrier services. "Danny Atme, Head of the Customer Business Team, Middle East Growth, Nokia, said: "We are happy to see PTCL taking the lead role in enhancing the capacity of its network as the consumption of broadband continues to increase, along with acquisition of new customers. Our advanced optical network technology upgrades PTCL's transport network to meet the unpredictable data traffic growth cost efficiently." 

ARTICLE

Protecting Children is Everyone's Business

The rapid expansion of broadband is transforming our lives, and the young digital users today are most prone to experiencing this transformation in all its subtleties. The level of exposure of the new generation of digital users online to both the good and the bad is something we, as Policymakers, Regulators, Technology Providers, and Operators, need to realize first ourselves, and then muster up our collective wisdom to work together towards protecting our most important asset: Our children. On our part, we believe this step can no longer be limited to academic discussions. If not addressed now, SDG 16.2, which has set forth the mission of ending abuse, exploitation, trafficking and all forms of violence and torture against children by the year 2030, will not be fulfilled. We need to act now.

Zain is aware how children with online access may also be adversely exploited in unthinkable ways, by those predators wishing to infringe upon the rights of our children.

There is no question over the positivity that digital communications has had over the years and the promise it holds as we speedily transition into the world of intelligent and ubiquitous connectivity. As an integrated digital communications services provider, Zain Group, has based an essential part of its digital strategy on the notion of utilizing mobile digital communications technologies to connect its users, including children, to a world that requires new types of skills to survive and thrive, while making the most of a host of new opportunities that now abound.

As a priority, Zain Group has done and is continuing to expand internet access and adoption of digital services and technologies to help prevent a new class of divides, which may emerge and prevent children from reaching their natural potential, should access not be extended to everyone. Also, Zain is aware how children with online access may also be adversely exploited in unthinkable ways, by those predators wishing to infringe upon the rights of our children. While such divides can mainly be attributed to poverty, racial or ethnic discrimination, gender biases, disabilities, geographic isolation due to war and territorial conflicts, or even due to our own lack of prompt action in safeguarding society's best interests, protection of children online is a fundamental necessity that has to be met, especially in view of grand goals defined in the global sustainable development agenda.



Scott Gegenheimer

CEO - Operations
Zain Group



Recognizing that our efforts to protect all children first also need to be targeted particularly at protecting vulnerable and disadvantaged children, who may be less likely to understand online risks – including loss of privacy – and more likely to suffer or be exposed to physical and psychological harms, we embrace the ITU's Child Online Protection (COP) initiative, which is a readily available blueprint for all of us and covers all aspects of the child-protection issue. We believe strongly that decision-makers, both from the private and public domains, need to become involved in in both letter and spirit of this program.

Several modes of engagement among decision-maker exist to help protect children, and most cannot be achieved without developing and enabling partnerships with the shared vision of keeping children safe and, in parallel, empowering them for the digital world. Such partnerships need to be wide-ranging among Mobile Operators and Regulators, for example, and may include direct funding from partners and issue-specific expert networks such as UNICEF, the Childhood Foundation, We Protect and others, with a commitment to developing tools and means, which may include but are not limited to Mobile Operator-run special helplines for children.

Such helplines should be part of a comprehensive approach tied into other programs in parallel to support both children and their parents through some of the issues they face in today's digitally complex society. Another mode of cooperative engagement to address the child-protection issue, is to raise specific child-rights issues in each of the markets where a multi-network Operator such as Zain Group operates. These may include awareness campaigns against child labor or child trafficking or other known issues that catalyze exploitation of or violence against children. Based on such issue-specific campaigns, the concerned Operator can take up the relevant issues with concerned regional and global bodies active on those fronts and can spearhead the implementation of expert recommendations into tangible action items. Another practical approach to limit children from adverse exposure

online, is to work with private, civil society, subject matter experts and semi-private entities as partners, to create more locally developed and locally-relevant content, especially for children who speak minority languages, live in remote areas or belong to marginalized ethnic groups, so that relevant information makes its way to their developing minds.

In deploying any combination of these options, Operators should proactively assess and analyze children's online habits using data analytics tools. At an intrinsic organizational level, blocking child abuse content on the network, remains a first line of defense. This approach when combined with intra-organizational detection of child-abuse content and internal policy-making with business partners and law enforcement agencies can also help detect and contain the spread of offensive materials.

Zain is taking demonstratable steps to prevent its networks and services from being used by offenders to collect and distribute child sexual abuse images or commit other violations against children. We strongly believe digital technologies offer significant opportunities to address child abuse in its many forms, and to empower children, enabling them to make their voices heard by sharing their opinions and experiences; or to access tools that reduce their vulnerability to abuse.

Holistically, Operators need to unify their stance on the need to ensure a safe online environment for children and to block the proliferation of child-abuse content over the Internet. The industry as a whole needs to enunciate its shared commitment toward ensuring that digital technologies only serve to fulfill the public good. Protecting children from being victims of abuse or exposed to abuse online, is an integral part of the public good – to which we all must affirm and commit our support.

Zain Group's Support to the Cause

Is a signatory of the GSMA's Mobile Alliance aimed at combating online child sexual abuse content. In 2017, Zain Group released a thought-leadership on the issue of protecting children's rights highlighting how to leverage digital

technologies to address the vulnerabilities that children face and how technology companies can help tackle the issue. A study undertaken by Zain in 2017 entitled "Leveraging Technology to Protect the Rights of Children" has shed light on the importance the role ICT plays when it comes to Child Abuse. Earlier in 2015, Zain established a partnership with Child Helpline International with the purpose of providing representation for Child Helpline International in markets where the organization was not present. Zain's partnership with Child Helpline International was part of a comprehensive program to protect the rights of children and educate the public

In the Middle East and Africa, the potential for dynamic 5G networks is coming to life. As 5G hits the market, the mobile ecosystem will become larger and more widespread and extensive than ever.

about the vulnerabilities faced by young people online today. In Saudi Arabia, Zain established a partnership to support Saudi Arabia Child Helpline which is a member of Child Helpline International, by providing free-of-charge calls for both the children calling and the child helpline receiving the calls. In Jordan, Zain announced its plan to provide technical support to Child Helpline 110, an entity run by the Jordan Foundation that is also a member of Child Helpline International. Zain also provides technical support as needed and will upgrade the helpline's telephone system into Primary Data Interface (PDI). In Kuwait, Zain took a major step forward by creating a toll-free line 147 in partnership with Child Helpline International and the Ministry of Communication. By the close inter-organizational cooperation between Zain Kuwait, Child Helpline International and the related government agencies, the company was able to pave the way to achieving meaningful policy reforms. In 2015, Zain also released subject specific videos in its Youtube channel highlighting the impact of child abuse. 📺



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SATELLITE NEWS

Rocket Lab Successfully Launches DARPA Satellite

A Rocket Lab Electron launch vehicle successfully lifted off from Launch Complex 1 on New Zealand's Mahia Peninsula at 23:27 UTC on March 28. The mission launched a prototype reflect array antenna to orbit for the Defense Advanced Research Projects Agency (DARPA). DARPA's R3D2 mission was launched just over 18 months from conception – a reduction in traditional government launch acquisition timeframes. According to the release, Rocket Lab is the only fully commercial small satellite launch service provider in operation. The Rocket Lab team has delivered 25 satellites to orbit, including new space technologies that provide capabilities such as weather monitoring, Earth Observation (EO), and Internet of Things (IoT) connectivity. The R3D2 mission was Rocket Lab's first of 2019, and the company is currently producing one Electron launch vehicle every 30 days across its Huntington Beach, California, and Auckland, New Zealand, production facilities. "Congratulations to our dedicated team for delivering another important and innovative asset to space – on time and on target. The unique requirements of this mission made Electron the perfect launch vehicle to lift R3D2 as a dedicated payload to a highly precise orbit," said Rocket Lab

Founder and Chief Executive Officer (CEO) Peter Beck. "Thank you to our mission partners. We look forward to continuing to provide frequent, reliable and rapidly-acquired launch services for innovative small satellites."



Marlink and Mahd Group Further Expand Partnership to Offer Connectivity Services in Oman

Marlink's enduring partnership with Mahd Satellite has been further cemented with the installation of a new Terralink Hub and RF uplink station at its headquarters in Muscat, in the Sultanate of Oman. The flexibility of this fully-managed network operator service from Marlink enables Mahd Satellite to offer a comprehensive range of VSAT communications capabilities for its customers while controlling the infrastructure to function within the country's regulatory framework. Marlink's managed Terralink Hub service supplies a complete end-to-end VSAT connectivity solution which features 24/7 Level 2 monitoring and control plus full marketing and engineering support, with value-added IP services including internet backbone access, routing, firewalling and a customer portal. For Mahd Satellite, the breadth and adaptability of the Terralink Hub's managed service translates into a

highly efficient and cost-effective means of meeting network capacity requirements and providing internet access for end-users to access diverse applications from business-critical email and video streaming to web browsing and support of internet apps. The service is specially adapted to sectors including defence, oil and gas, security, telecoms and IT, construction and utilities. "The installation of our versatile Terralink Hub on Mahd Satellite's premises in Oman signifies a very promising development in the continuing alliance between our two companies," says Kevin Thorley, Head of Sales Middle East, Marlink. "Not only is it an affirmation of the satisfaction which our connectivity services have already delivered, complying to a set of extremely specific parameters, but it also accentuates our commitment to facilitating business development for our partners in the Middle East. "By providing

Mahd Satellite with the ability to manage its own infrastructure, we have been instrumental in repositioning the company as a satellite operator, as opposed to a reseller, and we look forward to expediting many more partnerships in the future with a group that genuinely epitomises the 'Marlink Entrepreneur spirit'." "Mahd Satellite has always operated on the principle that business momentum and long-term success can be best achieved through partnerships with industry-leading global concerns," adds a Mahd Satellite spokesman, "and Marlink is in a field of its own when it comes to great value, end-to-end managed connectivity and IT solutions, reinforced by full service support plans. We're pleased to have Marlink's expertise to draw upon as we continue to make headway in Omani market sectors requiring VSAT services."

Space Flight Laboratory to Build HawkEye 360 next-Gen Microsatellite Cluster for Commercial Radio Frequency Geolocation

Space Flight Laboratory (SFL) has been awarded the prime contract to develop the next generation cluster of formation-flying microsatellites for HawkEye 360 Inc. of Herndon, Va. The HawkEye Constellation, comprised of multiple clusters of three satellites each, is the first of its kind to detect and geolocate radio frequency (RF) signals for maritime, emergency response, and spectrum analysis applications. SFL built the platforms and integrated the HawkEye 360 Pathfinder cluster which was launched into low-Earth orbit in December 2018 and commissioned early this year. The three formation-flying Pathfinder microsatellites have successfully demonstrated geolocation of VHF, emergency position-indicating radio beacon (EPIRB), automatic identification system (AIS) and marine radar signals. "Through the development, launch and commissioning of our Pathfinder cluster, SFL demonstrated exceptional ability to deliver the solution we required," said HawkEye 360 Founder and Chief Technology Officer Chris DeMay. "Their customer-first approach and engineering prowess resulted in the first-of-its-kind RF analytics we are generating today. We are proud to continue partnering with SFL on the development of our next set of spacecraft as we expand on-orbit capacity and enhance our capability to meet customer demands." SFL is developing the

next-generation cluster to service more sophisticated payloads as HawkEye 360 broadens its detection and geolocation capabilities. The cluster will incorporate SFL technologies that make on-orbit formation flying possible. Most prominent of these technologies is the high-performance attitude control system developed by SFL to keep micro- and nanosatellites stable in orbit. "The microsatellite bus selected by HawkEye 360 for the next-gen cluster is one we developed specifically to address the economics of commercial space activities," said SFL Director Dr. Robert E. Zee. SFL satellite technology was selected for the HawkEye 360 Pathfinder mission due to the importance of formation flying by multiple satellites for successful

RF signal geolocation and analysis. The relative positions of each satellite in the constellation must be known to accurately geolocate the transmission sources of the radio frequency signals. SFL first demonstrated affordable on-orbit formation control with smaller satellites in the 2014 Canadian CanX-4/CanX-5 mission. "We have developed compact, low-cost formation flying technology for commercial exploitation that is unmatched by any other satellite developer," said Zee. Established in 1998 as a self-sustaining specialty lab at the University of Toronto Institute for Aerospace Studies (UTIAS), SFL has built 25 nano- and microsatellites with nearly 100 cumulative years of successful operation in orbit to date.



Spaceflight Prepares 21 Satellites for PSLV Mission

Spaceflight will launch 21 spacecraft on a rideshare mission from India's Polar Satellite Launch Vehicle (PSLV) at India's Satish Dhawan Space Center. The launch is scheduled for April 1. Payloads aboard the mission include the Astrocast-02 3U cubesat from Switzerland-based Astrocast and Flock 4a, 20 next-generation Dove satellites from Planet. This launch represents Spaceflight's eighth launch on a PSLV and with the completion of this mission, the company will have sent 95 spacecraft to orbit aboard PSLVs. Spaceflight successfully launched the

first test satellite of Astrocast's Internet of Things (IoT) Nanosatellite Network on its SSO-A dedicated rideshare mission in December 2018. Astrocast's network of 64 cubesats aim to extend the reach of two-way communications to the 90 percent of the globe currently not covered by cellular networks. In what is Planet's first launch of 2019, Flock 4a will join its current constellation of more than 100 Doves, replenishing the on-orbit fleet and providing upgrades to its imaging chain to improve image sharpness, radiometric consistency and spectral precision. "PSLV

missions continue to offer a reliable and proven launch option for our customers," said Spaceflight Chief Executive Officer (CEO) Curt Blake. "By working with Antrix/ISRO and a wide range of vehicle providers, we are uniquely positioned to offer the greatest number of launch options to our customers. Having greater flexibility in launches can minimize the negative impacts of delays which is especially valuable for organizations launching multiple spacecraft."

Inmarsat to Go Private in \$3.4 Billion Deal

Inmarsat reached an agreement to be acquired by a group of investors, with a deal that values the satellite communications company's equity at \$3.4 billion. It was confirmed last week that Inmarsat was in talks with Triton Bidco, a joint venture comprising funds managed by Apax Partners and Warburg Pincus alongside the Canada Pension Plan Investment Board and Ontario Teachers' Pension Plan Board. While it was cautioned that this may not come to fruition, in fact it took a matter of days for the deal to be agreed. Triton Bidco said Inmarsat's business model is "characterized

by predictable revenues from a range of long-term contracts with governments and other financially secure customers", with opportunities in in-flight connectivity and IoT highlighted. But it also noted that the company is going through a multi-year investment cycle to capitalize on growth opportunities, with returns difficult to predict. The bidder said it will "leverage the experience of its shareholders as investors in the satellite sector and broader telecommunications space to assist Inmarsat during this critical phase in its business development". This will allow the satcoms player to focus on the effective management of the business and delivering on its potential during the current investment phase. Triton Bidco also pledged to maintain Inmarsat's headquarters in the UK and maintain a level of R&D spend consistent with past practice. Shareholders are being offered \$7.21 per share in cash, made up of a \$7.09 payment and a \$0.12 per share dividend. This is a 35 per cent premium on the volume-weighted average price of \$4.04 in the three months to 18 March 2019. Inmarsat said its directors intend to "unanimously recommend" the scheme, and will be supporting it with their own holdings. Triton Bidco received support from the owners of around 11.4 per cent of Inmarsat's share capital at close of play on 22 March 2019. Completion of the deal is subject to regulatory approvals in a number of markets. Inmarsat has been the subject of interest for a number of months. In addition to Triton Bidco, which began talks early this year, in 2018 EchoStar dropped an informal \$3.2 billion bid, which was said to undervalue Inmarsat.



Arianespace Orbits 600th Satellite, the PRISMA Earth Observation Satellite for the Italian Space Agency

On its third launch of the year, Arianespace has successfully orbited the PRISMA Earth observation satellite on behalf of the ASI Italian space agency, within the scope of a contract with OHB Italia. This was the first Vega launch in 2019, and the 14th successful launch in a row for this light launcher since its introduction at the Guiana Space Center (CSG) in 2012. The launch took place on Thursday, March 21 at 10:50 pm local time in French Guiana. PRISMA is the 600th satellite to be orbited by Arianespace and the eighth for Italian institutions or operators. Following the launch, Arianespace Chief Executive Officer Stéphane Israël said: "With today's successful launch of the PRISMA Earth observation satellite, Arianespace has orbited its 600th satellite! We are very proud to continue performing our primary vocation of ensuring independent access

to space for Europe, with a focus this evening on Italy. Today's mission, carried out for the Italian space agency, ASI, and the Italian industry consortium led by OHB Italia SpA and Leonardo SpA, illustrates the reliability of the Vega launcher, which has performed its 14th successful launch in a row. It also confirms the launcher's attractiveness as a champion of the Earth observation market, since Arianespace now has 9 Vega and Vega C in its launch order backlog. Our third successful mission of the year, following launches by Ariane 5 and Soyuz last month, reflects the excellence and complementary fit of our family of launch vehicles." PRISMA (PREcursore IperSpettrale della Missione Applicativa) was built for the Italian ASI space agency by OHB Italia as prime contractor, with Leonardo responsible for the payload. Lofted by Vega into low Earth orbit (LEO),

PRISMA will provide major applications to protect the planet and ensure Italy's environmental safety. The satellite is fitted with a state-of-the-art electro-optical instrument, comprising an innovative hyperspectral sensor and a medium-resolution panchromatic camera (sensitive to all visible wavelengths), and will employ these capabilities for environmental monitoring, the management of resources, identification and classification of crops, the fight against pollution, etc. Today's flight VV14 was the 12th Vega mission for Earth observation, while PRISMA is the 70th satellite launched by Arianespace for this type of application. Through today's successful launch, Arianespace is once again contributing to its assigned mission of providing launches that make life better on Earth.

UAE Space Agency Announces Details of 813 Satellite

The UAE Space Agency has announced details of the new 813 satellite, which was launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, as a gift from the UAE to the Arab countries. The announcement of the new satellite followed on from the signing of the charter for the establishment of the "Arab Space Coordination Group" at the second edition of the Global Space Congress, held in Abu Dhabi. The new satellite will be designed and manufactured by a number of Arab engineers from countries that have signed the charter for the launch of the first group of its kind in the Arab world. The eleven countries are the United Arab Emirates, Jordan, Bahrain, Algeria, Saudi Arabia, Sudan, Lebanon, Kuwait, Morocco and Egypt. The member countries of the Group voted for the UAE to lead the new organization. The new satellite 813 is named in reference to the date that marked the beginning of prosperity for the House of Wisdom in Baghdad under the reign of Al-Ma'mun. Representing the region, the House embraced scientists, translated notable texts and produced scientific capabilities. The multi-spectral satellite will monitor

the Earth and measure the environmental and climatic elements in a number of Arab countries, as well as vegetation, soil types, minerals and water sources, measuring greenhouse gases, pollution and dust levels as well. The new satellite will be funded by the UAE Space Agency and will be developed by Arab engineers at the state-of-the-art facilities at the National Space Science and Technology Center at the United Arab Emirates University in Al Ain, the only research space center of its

kind in the Middle East. The development of the satellite will take three full years and will have a lifespan of about five years. It will also have a polar orbit of 600 kilometers. The data will be sent to a ground station in the UAE and receiving stations in some Arab countries for the benefit of a number of environmental authorities, municipalities and institutions concerned with the agricultural sector and urban planning industry.



Lockheed Martin Develops World-First LTE-Over-Satellite System

Spaceflight revealed that it will launch two payloads on its first rideshare mission to Geosynchronous Transfer Orbit (GTO).



The mission is scheduled for no earlier than mid-February 2019 aboard a SpaceX Falcon 9 launching from Launch Complex 40 at Cape Canaveral Air Force Station, Florida. The primary payload on the mission is a telecommunications satellite for the South East Asia region. It was built by SSL, a Maxar Technologies company, which also procured the launch vehicle. Spaceflight will manage the launch of the two secondary payloads, Israeli non-profit SpacEL's lunar lander, and the U.S. Air Force Research Lab's (AFRL) experimental small satellite, S5. This will be Spaceflight's first mission beyond Lower Earth Orbit (LEO) and its first combined launch with SSL. In addition to securing capacity aboard the launch vehicle, Spaceflight is handling all the mission management and integration services for the lunar lander, called Beresheet, and AFRL's spacecraft. This includes a multitude of services, from the unique aspects of pre-launch design, assembly, and integration to the final analysis and testing of the architecture before the spacecraft are encapsulated into the rocket.

HISPASAT and GetSAT Reach Agreement to Offer Mobile Satellite Services for Security and Emergency Markets

HISPASAT and GetSAT have signed an agreement to offer Satellite on The Move (SoTM) Services. By pairing GetSAT's ruggedized terminals and HISPASAT's powerful satellite fleet, both companies strengthen their business opportunities in aerial, drone, maritime, and land-based emergency services for security and emergency applications in Latin America, Europe and North Africa. This joint solution ensures safe communications when natural disasters occur for urgently activated rescue teams and for security agencies using UAVs, helicopters, planes, or terrestrial vehicles. The companies reached this strategic partnership after the successful demonstration of GetSAT's MicroSAT L/M Land and Maritime mobile terminal, which reached data traffic speeds of three Mbps, during both upload and download, while remaining connected to HISPASAT's fleet. GetSAT's terminals are based on its patented InterFLAT technology, which allows signals to be

transmitted and received in the same panel, thus reducing the size, weight and energy consumption to provide advantages essential for the success of critical missions. The agreement reduces the barriers to entry of this type of service for potential clients, thereby minimizing the impact of user's investment and operating costs. Ignacio Sanchis, Business Director of HISPASAT, said, "We want to address the Emergency and Security services market, which is rapidly growing and requires robust, consistent connections in which satellites play a key role. Together with GetSAT, HISPASAT will be able to take advantage of the capacity of its entire network to offer broadband solutions in the Ka and Ku bands for projects that require rapid response times combined with extensive broadband use to transmit data". Kfir Benjamin, GetSAT Chief Executive Officer, reported, "Our demonstration showed GetSAT's high technological proficiency in reaching constant high data

speeds in on-the-move applications. The unique advantage of GetSAT's compact, lightweight, ultra-low power consuming systems is that no user ever compromises on quality, size, power or weight. Working with Hispasat augments our business development and expands our geographic reach and potential client base." GetSAT's MicroSAT terminals are constructed in a light and compact installation. The L/M family of products are micronized, fully integrated, on-the-move, ruggedized solutions. All L/M terminals are easy to deploy and integrate, and can be outfitted with various antenna sizes in accordance with bandwidth requirements of ground, air and marine applications. A unique all-in-one design including BUC and modem is optimized for harsh environments specs and its ultra-low power-consuming platform is compatible with KA and KU-Band applications.

AsiaSat Revenue Up, But Regional C-Band Pressure Mounting

Hong Kong-based fleet operator AsiaSat reported a third year of increased revenue, but warned that the C-band spectrum it uses for television broadcasts is now under threat in several of its markets. AsiaSat tallied 1.44 billion Hong Kong dollars (\$183.7 million at current exchange rates) in revenue, up 6.5 percent over 2017, which was also a growth year, as was 2016. The company's core fleet of five satellites saw a 3 percent increase in capacity use, reaching an overall fill rate of 72 percent. Four of those satellites carry C-band transponders, however, causing AsiaSat to worry about the impact regulators may have by repurposing some of those frequencies for nascent 5G cellular networks. "[D]ue to stepped up efforts by regulators around the world to re-purpose a portion of C-band satellite spectrum to facilitate the roll-out of new 5G services, there have been concerns over the tightening supply of C-band transponder capacity available for broadcast distribution," AsiaSat Chairman Gregory Zeluck said in

a statement accompanying the earnings release. Last year AsiaSat CEO Roger Tong blamed Intelsat for opening the floodgates around the world for regulators to go after satellite airwaves with renewed vigor after the operator allied with chipmaker Intel on a proposal to allow 5G networks to use a portion of C-band, but only in the United States. Speaking at the CASBAA Satellite Industry Forum last summer, Tong said the satellite industry had already proven its ability to defend its use of C-band at past World Radiocommunication Conferences — where regulators gather every three or four years to debate how spectrum should be used — but that now cellular operators have the excuse they need to claim more need for the band. Clare Bloomfield, director of policy and research for CASBAA, since renamed the Asia Video Industry Association, or AVIA, said the U.S. C-band debate was having an impact on Asia. Satellite operators are preparing for the next World Radiocommunication Conference, which takes place this

October and November in Sharm el-Sheikh, Egypt. Asia-Pacific satellite operators have argued that C-band is more important in their markets because of the spectrum's resilience during rainstorms that are a regular part of life for many of their customers. AsiaSat said broadcast customers account for two thirds of its C- and Ku-band capacity, and continue to grow. Even its newest satellite, AsiaSat-9, has become a video "hotbird" AsiaSat said, providing broadcast transmissions instead of the data-centric services it was designed for. AsiaSat reported a profit of 429 million Hong Kong dollars for 2018, up 32 million Hong Kong dollars thanks to an increase in revenue. AsiaSat said full payload leases on two of its satellites — AsiaSat-4 and AsiaSat-8 — buoyed revenues. Other satellite operators are borrowing both spacecraft. Pakistani satellite operator Paksat is borrowing AsiaSat-4, a 16-year old satellite rebranded as Paksat-MM 1, for coverage of Pakistan, the Middle East and Asia.

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UAE Cabinet Approves National Space Strategy 2030

The National Space Strategy aims at achieving UAE's vision in the field of space exploration, technologies, and applications. The UAE Cabinet, chaired by Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, adopted the National Space Strategy 2030 during its meeting at the Presidential Palace in Abu Dhabi. The cabinet meeting was attended by Sheikh Mansour bin Zayed Al Nahyan, Deputy Prime Minister and Minister of Presidential Affairs. Sheikh Mohammed asserted that the UAE has been able to establish an economic powerhouse and advanced infrastructure by young Emirati talents, which has enabled it to be at the forefront of the space exploration industry today. "Last year we celebrated the launch of the first satellite fully built by young Emirati engineers, and in the very near future we will see them operating at international space technology centers, based in the UAE. We will see Emirati cadres, highly skilled and specialized in space science, achieving scientific breakthroughs that serve the entire humanity," Sheikh Mohammed said. "We are investing in the space industry, with ambitious projects and initiatives that will benefit our citizens and contribute to key sectors of the national economy. This is an important milestone for our country, and we are aiming to become a model for countries seeking to launch ambitious space programs," he added. The National Space Strategy aims at achieving UAE's vision in the field of space exploration, technologies, and applications. It also constitutes one of the pillars of the regulatory framework for the space sector in the country which consists of four components: National Space Policy, Space Sector Law, Space Regulations, and National Space Strategy. The UAE seeks to establish a major global hub for space science and technology, through investing in building capabilities



and creating a scientific, legislative and financing environment that is stimulating and attractive for space projects. The strategy sets the general framework for UAE's space industry and activities for the years 2030, including government activities related to space, commercial activities, and scientific activities carried out by public and private sector operators, academic institutions and R&D centers. The cabinet stressed on the importance of raising awareness about the importance of the space sector among the Emiratis youth, and the importance of enhancing the role of advanced national research and development centers. The UAE possesses 4 specialized centers in the research and development of spaces all of which have manufacturing capabilities, and where Emiratis represent more than 50 per cent of the workforce, with more than half of them being women. The National Space Strategy includes 6 objectives, 21 programs and 79 initiatives, which translate into focus areas benefiting more than 85 entities in the UAE. The Emirates Space Agency is responsible for following up the implementation of

the strategy in cooperation with strategic partners and more than 25 agencies and space centers abroad. The cabinet had earlier adopted the decision to regulate and develop the services of the residency and ports affairs sector by organizing the issuance of residence permits to investors, entrepreneurs, innovators and human talents in order to stimulate the business environment in the UAE. The decision aims to create an attractive environment for investment in line with the UAE's position as a top destination for investors and visitors. In the organizational and governmental affairs, the cabinet had also approved the formation of the Financial Activities Committee, which is mandated to consider cases related to financial activities that are referred to it by the regulatory authorities, and to study any proposal or opinion to regulate any financial activity other than those mentioned in the laws. The cabinet had also given approval for the signing of a number of international treaties to enhance international cooperation with the global community.

Telecom Satellite Project for Nepal Launched

The Nepal Telecommunications Authority and Thales Alenia Space, a Joint Venture between Thales (67 %) and Leonardo (33 %), have signed an agreement under which Thales Alenia Space will build the national satellite telecommunication system for Nepal. This agreement is following the Letter of Intent previously signed on March 5 in Paris by the Honorable Minister of Communication & Information Technology of Nepal, Mr. Gokul Prasad Baskota, and the Secretary of State to the Minister for Europe and Foreign Affairs of France, Mr. Jean-Baptiste Lemoyne. This very high-performance C/Ku Band satellite, yet to be named by Nepal, is to be launched by 2022 and to be positioned at the 123.3° E orbital slot reserved for Nepal by ITU. It will be based on the SpaceBus National Satellite System solution developed by Thales Alenia Space. The main mission

is to make high-speed internet available throughout Nepal, spearheading services such as telemedicine, e-learning, e-government, disaster management, information technologies, agriculture, tourism, hydropower and other value-added services, along with the provisions of Direct-to-Home television and mobile phone backhauling. The ubiquitous and versatile communication services provided by the satellite are primarily targeted at reducing the digital divide, especially in the underserved rural areas. "It is a privilege for Thales Alenia Space to have been selected by Nepal Telecommunications Authority for providing its national satellite. We believe the project will be a key asset to bridge the digital divide and a strong vector of economic growth. We are also thrilled to embark into this long term cooperation with Nepal and support the

country develop its space capabilities and services for the benefit of all its citizens" declared Eric Imbert, Sales Vice-President for Thales Alenia Space. The Minister of Communication and Information Technology, Mr. Gokul Prasad Baskota added: "To successfully compete with other countries, to give high speed internet to all our citizens and to be recognized regionally, we want Nepal to accelerate its pace on the way to digitization. No one must be left behind on this path. Our National Satellite will help us jump into a better future. We found in Thales Alenia Space an impressive expertise and a strong partnership spirit that match our ambition to be self-dependent, make self-identity in space technology and to pace towards prosperity of digital Nepal"

Russian Satellite Communications Company Joins the Unmanned Navigation Project

Russian Satellite Communications Company (RSCC) has joined the pilot project of Maritime Unmanned Navigation (MUNIN). In this project, the company intends to provide communication services on mobile platforms using the maritime VSAT technology. The MUNIN pilot project provides the development and testing of technologies for automated navigation and remote control of vessels. The project is implemented with the assistance of the Russian Ministry of Industry and Trade as part of the National

Technological Initiative to support high technologies in the most promising areas of the maritime industry. In autumn 2018, MARINET Industry Association announced the launch of an unmanned navigation project to be implemented by leading Russian shipping companies and developers of marine navigation solutions and control systems. "We appreciate the invitation to take part in the Unmanned Navigation Project and believe that our company's competencies and experience in the provision of innovative communication services at sea will be in great demand. Currently, the global industry is embracing all new areas of development: territories with severe geographical and climatic conditions (arctic and desert regions) and the entire World Ocean. According to experts, the most promising area for development is the maritime industry, where revolutionary changes are expected in the next 10–20 years. In particular, it includes exponential growth in mining and food production output (fisheries and aquaculture production) as well as digitalization of shipping with an increase in the number of vessels of the maritime commercial fleet from the current 50 thousand vessels to 70-80 thousand vessels by 2035. VSAT satellite communication technology with GEO satellites and special motorized stabilized satellite dishes on vessels is used to transmit larger volumes of information between offshore facilities and the shore.

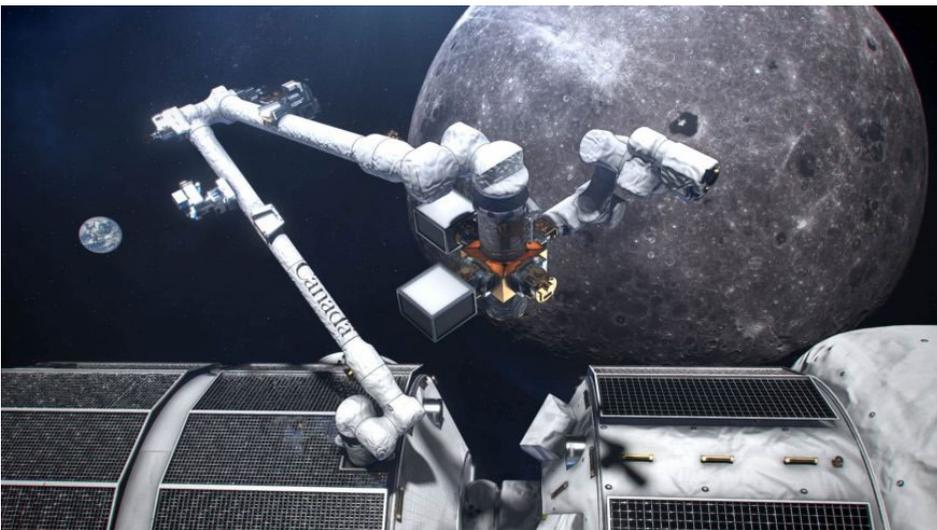


Canada's Long-Awaited Space Strategy Emphasizes AI, EO and Deep-Space Robotics

The Canadian government unveiled its long awaited national space strategy, focusing on artificial intelligence, deep-space robotic systems, Earth-observation capabilities and searching for new ventures with the European Space Agency. The Canadian government will also try to cut the regulatory red tape the space industry has complained has hindered projects from moving forward. But the centerpiece of the 22-page strategy was the recently announced commitment to NASA's lunar Gateway project with a financial contribution to cover a 24-year period and the development of a new generation robotic Canadarm. With that announcement Canada became the

first nation to formally commit to the Gateway project. Canada will spend 2 billion Canadian dollars (\$1.4 billion) over 24 years on the Lunar Orbital Platform Gateway program, a human-tended facility in orbit around the moon, as well as other space programs. "Our commitment to the Gateway is the cornerstone of our space strategy," Navdeep Bains, Minister of Innovation, Science and Economic Development, said in a televised address announcing the new strategy in Edmonton, Alberta. "The bottom line is we're taking the necessary steps to make Canada a successful spacefaring nation," he added. Canada will develop and contribute a smart robotic system – Canadarm3 – that

will repair and maintain the Gateway. The space strategy noted the government has committed 125 million Canadian dollars to artificial intelligence innovation, which in turn will help the country remain a world leader in AI-enabled space robotics. The strategy also highlighted funding of 150 million Canadian dollars over five years for a new Lunar Exploration Accelerator Program to help small and medium-sized businesses develop new technologies to be used and tested in lunar orbit and on the moon's surface in fields that include artificial intelligence, robotics and health. Future earth observation capabilities will be prioritized. Canada will launch the three spacecraft Radarsat Constellation Mission in late May. But the strategy noted that the Canadian Space Agency is planning for a new generation of Earth-observation satellites although it did not provide further details. The strategy also repeated the 2018 commitment to provide \$100 million in funding over five years to invest in projects that relate to the development of low Earth orbit satellites that support broadband connectivity. The Canadian government will also review the country's regulatory framework for space-related activities to make sure the rules are designed to provide timely responses for industry, maintain strategic oversight for national security and enable commercial growth, the strategy pointed out.



Inmarsat to Place GX Flex Next-Generation Satellite System Order This Year

British fleet operator Inmarsat is in the middle of a "very competitive procurement process" for GX Flex, its next-generation satellite system, CEO Rupert Pearce said. The satellite system, first discussed almost a year ago, will be markedly different from traditional communications satellite programs that often take three to four years to build and launch, he said. Pearce, who has described Inmarsat as immune to the oversupply of satellite capacity afflicting

other operators, said the satellite system Inmarsat intends to buy will solve what it views as more pressing problems: keeping pace with customer demand and not getting locked in to outdated technology. "I am very confident what we will bring forward later in the year will be lower cost in absolute terms, higher agility, and [a] tremendous step change in capabilities without overcommitting to any particular year of technology," Pearce said during an

earnings call. Pearce said GX Flex will be a lower cost system compared to Inmarsat's recent investments, enabling the company to reduce capital expenditures from an expected \$500 million to \$600 million in 2019 and 2020 to between \$450 million and \$550 million in 2021. GX Flex, Inmarsat's next generation broadband network, will keep the company competitive "into the mid-2020s and well beyond," he said.

New Automatic Direction-Finding Antenna Enables Rogue Transmissions to be Pin-Pointed Quickly and Accurately



Now available from Link Microtek is a new automatic direction-finding (DF) antenna that allows the source of unauthorized or interfering transmissions to be located rapidly and accurately, even in urban areas where signal reflections can make this a challenging task. Recent drone activity at Gatwick and Heathrow airports has served to highlight the disruption that can be caused when illicit transmissions continue unchecked, and the new ADFA 1 antenna could be used as part of a solution to help security and communications professionals deal with such situations as quickly as possible. The device is also ideal for telecommunication or defence applications. Manufactured by Narda Safety Test Solutions, the ADFA 1 antenna covers the frequency range 200MHz to 2.7GHz and is designed for use with the company's SignalShark portable real-time spectrum analyzer. There is no need for a laptop computer. By means of a strong magnetic mount, the antenna can be attached to the roof of any normal vehicle to enable a series of random bearings to be taken in the suspected area. Each bearing cycle achieves a typical accuracy of 1 degree and takes just 1.2 milliseconds, thereby ensuring reliable measurements even for pulsed signals or transmissions of very short duration. The results can be displayed by SignalShark numerically or with live visualization of the transmitter location in the form of a heat map. In addition, the ADFA 1 determines the elevation angle of the signal bearing, allowing the location of the source to be narrowed down to an individual floor level. Users of the new antenna can also observe the broadband spectrum at the same time as determining the signal bearing, which enables them to continue tracking a source that suddenly changes channel. 📡

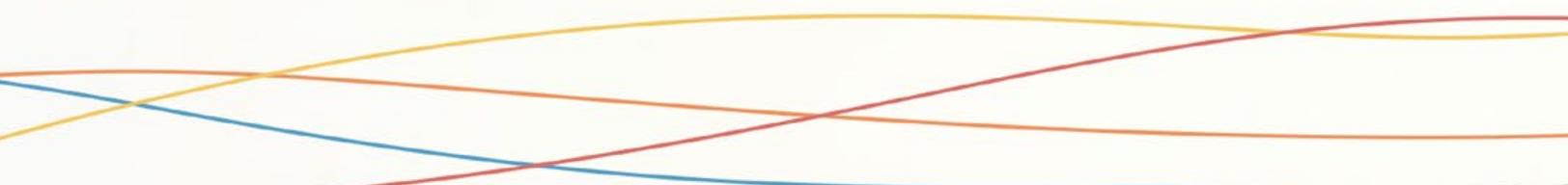


SAMENA Telecommunications Council **TELECOM LEADERS' SUMMIT 2019**

5G is ON Forum

🕒 Thursday 18th April, 2019

📍 Atlantis, The Palm – Dubai, UAE



ARTICLE

5G is ON

With the first quarter of 2019 almost behind us, I can confidently say that Huawei has carried plenty of momentum from 2018. Our presence there highlighted three key development areas: our 5G acceleration and leadership, our innovations for operators and consumers, and our AI-enabling intelligent operations.

Targeting operators and carriers at Mobile World Congress this year, we showcased how Huawei's intelligent services and innovations can help partners identify new business opportunities and thereby achieve growth.

As I reflect on what has already been achieved and what lies ahead, I am proud to see that we are unlocking a new era in 5G. This marks great progress towards one of our main goals: to build a fully connected, intelligent world. With this ambition in sight, Huawei is leading the way with our deployment strategy and forming important partnerships with key operators and ministries across the region.

Targeting operators and carriers at Mobile World Congress this year, we showcased how Huawei's intelligent services and innovations can help partners identify new business opportunities and thereby achieve growth. AI, for example, is enabling the autonomous driving network to emerge, and fueling evolution for the industry. From a consumer perspective, as 5G becomes more and more prevalent, we will also feel the technology's transformative impact on our everyday lives. 5G is helping realize society's vision of living in interconnected, efficient, smart cities by fundamentally reshaping the transport, retail and infrastructure we rely on almost daily.

With our attention and efforts devoted to greater 5G development, deployment and infrastructure, we are using the year ahead to nurture the telco organization ecosystem.

We recognize the mutual benefits gained by Huawei and its operators when working together; customizing infrastructure and building to specific requirements so a city may wield 5G



Charles Yang
President
Huawei Middle East



We recognize the mutual benefits gained by Huawei and its operators when working together; customizing infrastructure and building to specific requirements so a city may wield 5G in its own way, towards any desired outcome. Huawei's consultation in the process ensures we are setting a global 5G standard and creating opportunities for cities to achieve digital transformation - be it through the exchange of large data volumes or secure, real-time transactions and fraud detection.

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5G standard and creating opportunities for cities to achieve digital transformation - be it through the exchange of large data volumes or secure, real-time transactions and fraud detection.

Towards this end, the extent of Huawei's ambition was made clear in MWC. There we revealed several key projects that signal our commitment to scaling-up 5G in the Middle East, and shared new insight into our AI operations. Notably, we shared our plans to work alongside operators in the Middle East to roll-out 5G networks in the region, and signed an agreement in Pakistan to connect rural areas with fiber and wireless.

Our announcements at MWC point to the fact that we are the preferred long-term partner for digital conversion - itself indicative of our expertise, customer support, and the trust placed in our services as a dependable provider of world-class ICT.

Our value to our customers reflects Huawei's unwavering commitment to social responsibility, as we connect the unconnected through secure and stable networks. Our MWC announcements demonstrate that we prioritize network

stability over our commercial interests while helping business growth on the operator-side. Trust in our capabilities is supported by the fact that we are the ICT solutions provider of choice in 170 countries and regions, serving over one-third of the world's population.

At Huawei, we believe that forging strategic partnerships is the driving force behind our unwavering growth. These relationships help us ensure that no city or rural area is left behind, and no operator or consumer is left out during a time of magnificent, global digital transformation. 🌐

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WHOLESALE NEWS

Chile Looks to End Roaming Charges in Argentina, Brazil, Peru and Colombia

Sector watchdog the Department of Telecommunications (Subsecretaria de Telecomunicaciones, Subtel) has published an update on its progress towards eliminating roaming charges for Chilean subscribers travelling in Peru, Argentina, Brazil and Colombia. Agreements to end roaming fees for users in Chile and Argentina have been signed by the countries' respective governments and will take effect from 1 May 2020. For Brazil, the elimination of roaming charges has been included in a free trade agreement that will be submitted to parliament for consideration within the next few days. Subtel notes that Peru and Chile already

have an Economic Complementation Agreement (Acuerdo de Complementación Económica, ACE), however, and as such regulatory authorities in each country are working on the development of a protocol that complements the existing treaty. Finally, President Sebastian Pinera and his Colombian counterpart Ivan Duque Marquez have expressed their intention to form an agreement to cooperate on technology and innovation which would include, amongst other measures, the end of roaming charges between the two countries. Commenting on the plans, Minister of Transport and Telecommunications Gloria Hutt said:

'The elimination of roaming will mean an important benefit for users in different countries. It will boost tourism in the region by removing an important cost when planning trips. It will also promote commercial exchange between countries, facilitating the realization of business. But it will also bring good news for the inhabitants of border areas – as in the case of Peru and Argentina – who historically have moved between countries to visit relatives, or for work or recreational reasons, facilitating their movement and allowing them to be constantly connected.'

Telia Carrier and Telxius Ink Wholesale Network Capacity Deal

Switzerland's Federal Communications Commission (ComCom) has completed a review of the prices charged by state-owned fixed line incumbent Swisscom for certain regulated services and has announced plans to lower the prices for interconnection, local loop unbundling

(LLU) and carrier line services with retroactive effect for the 2013-2016 period. ComCom noted that the prices Swisscom charges for services provided to its competitors must be cost-based, adding that the review used fiber-optic cabling as the basis for its cost model for the first

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



ACM Orders VodafoneZiggo to Publish Complete Reference Offer or Pay Up to EUR1m

Dutch telecoms regulator ACM has ruled that cableco VodafoneZiggo's wholesale broadband access reference offer does not meet the obligations imposed in its Wholesale Fixed Access market analysis. Consequently, VodafoneZiggo must publish a complete reference offer (with detailed pricing and terms for internet, TV and telephony access) by 31 March 2019 or pay fines of EUR100,000 (USD113 million) per day, up to a maximum EUR1 million. The decision followed a request from T-Mobile Netherlands to take action against VodafoneZiggo for breach of the obligation to publish a complete reference offer on 1 January 2019.



ARKEP Opens Consultation on Planned Roam Like Home System with Albania

Kosovo's Regulatory Authority for Post and Electronic Communications (Autoriteti Rregullator i Komunikimeve Elektronike dhe Postare, ARKEP) has opened a public consultation on a draft plan to implement a 'roam like at home' policy with Albania. The decision would see ARKEP regulate the following tariffs: wholesale roaming tariffs Kosovar cellcos apply to Albanian providers when the latter's subscribers are roaming in Kosovo; call termination rates for international calls related to roaming between the two countries;

and the retail tariffs charged by Kosovar mobile providers whilst their subscribers are roaming in Albania. The consultation lasts until 15 April 2019 and the regulated rates are scheduled to take effect from 15 June 2019. The draft decision sets out a glidepath for wholesale rates until 1 July 2025, along with the maximum additional charge and maximum retail fees for the next two years. Under the terms of the decision, the initial retail price ceilings would be set at EUR0.19 (USD0.21) per minute for calls, EUR0.06 for SMS and

EUR0.18 per MB. In a related development, ARKEP has adopted a decision finalizing a new frequency plan. The decision allows for spectrum in the 790MHz-862MHz band to be used for mobile and fixed communications networks (MCFN), whilst the 880MHz-815MHz/925MHz-960MHz and 1710MHz-1785MHz/1805MHz-1880MHz bands can now be used for GSM, UMTS, LTE, WiMAX and IoT wireless systems.

Chile's Subtel Proposes 77% Fixed Interconnection Rate Cut

Chilean telecommunications regulator Subtel has proposed slashing the wholesale charges paid to access Telefonica's fixed line network by 77 percent to CLP 0.8 a minute from the previous rate of CLP 3.7. The watchdog said it rejected Telefonica's

proposal to increase the rate in that it goes against the current global trend to reduce interconnection costs, especially in OECD member countries. Telefonica now has until 13 March to request that an expert commission be set up to examine

Subtel's proposal. Telefonica currently dominates Chile's fixed line market with a 41.2 percent share, followed by VTR with 19.8 percent, Entel with 17.4 percent and GTD and Claro with 11.0 percent and 9.1 percent respectively.

Bosnia Government Approves Roaming Price Cut And 4G Licenses

The Council of Ministers of Bosnia and Herzegovina has established a proposal for an agreement to reduce prices of roaming services in public mobile communications networks in the Western Balkans region. The Council of Ministers of Bosnia and Herzegovina also has adopted a decision on the introduction of 4G mobile networks. The aim is to have full 4G coverage within five years and 60 percent of the inhabited territory covered in a year. The communications regulator will issue 15-year spectrum licenses to operators

at a cost of BAM 17.5 million, payable in five equal installments from 2019 to 2023. As announced, the proposal of the agreement will be immediately submitted to the BiH Presidency, and Deputy Minister of Communications and Transport is proposed for BiH signatories. This agreement will come into force on 1 July 2019, when the prices of roaming services in the countries of the region will gradually decrease, and in 2021, full abolition is planned. The Council of Ministers, at the proposal of the Communications

Regulatory Agency, issued a Decision on licenses to use the radio frequency spectrum to provide services through mobile access systems. This decision makes it virtually possible to introduce the 4G network in BiH, and mobile operators are committed to improving their services, which include better service and coverage of the territory and road communications in BiH. The agreement will be signed during the Digital Summit, which will be held in early April 2019 in Belgrade.

MTN Signs Up to Liquid Telecom's 4G Roaming Service

Liquid Telecom South Africa has secured its first customer, MTN, to offer 4G roaming to millions of South Africans. This includes LTE services to fuel the growing demand for high-speed mobile broadband. The wholesale roaming service will be made available across Liquid Telecom's network nationwide. According to

Reshaad Sha, CEO of Liquid Telecom South Africa: "With MTN as a customer we have an opportunity to utilize our existing spectrum assets, so more people than ever will have access to fast and reliable mobile internet – and across Liquid Telecom's network nationwide for the first time. This builds on our vision to give everyone the right to be connected by bringing high-speed broadband connectivity to all. The benefits are massive, particularly for organizations keen to fully embrace 'digital transformation' to improve productivity, customer service and performance." MTN South Africa CEO, Godfrey Motsa said "This sort of infrastructure sharing deal is good for the industry, as it reduces the need for excessively high capital investment and it is also good for customers that immediately benefit from even greater access to fast and reliable mobile data. Our focus is offering the very best experience to our millions of customers and by roaming on Liquid Telecom, we are deepening our commitment to continue to be the Best Network in South Africa, through our consistent and reliable network performance."



Moroccan Regulator Approves Orange Morocco's National Roaming Offer for Universal Service

Moroccan regulator ANRT published a decision approving Orange Morocco's first technical and pricing offer for national

roaming to enable universal service provision in areas covered by its mobile network. A similar ruling on the terms

submitted by Maroc Telecom was issued by the regulator in August 2018. The offer covers LTE, as well as 2G and 3G services. 📶

INNOVATION
ORCHESTRATOR
FOR
**NETWORK
TRANSFORMATION**



ACCESS

CORE

OSS

ENTERPRISE

ARTICLE

5G Is Poised to Revolutionize Industries Beyond Telecommunications



Manish Vyas

President of Communications, Media & Entertainment Business and CEO of Network Services
Tech Mahindra

Tech
Mahindra

The pace of technological innovation has increased exponentially over the past century. It took the telephone 75 years to reach 50 million users. It took the Internet only four years to reach the same number. However, those metrics pale in comparison to the success of the smartphone game Pokemon Go, which was released in the summer of 2016. It reached 50 million users in only 19 days. With 5G networks on the horizon, user bases will continue to grow at breakneck pace.

Enhanced Mobile Broadband (eMBB) will transform media distribution and access. Massive Internet of Things (MIIoT) will be the connectivity foundation of smart cities. And Ultra-Reliable Low Latency Communication (uRLLC) will make autonomous vehicles safer and more reliable.

This next-generation network will accelerate innovation in a broad set of industry verticals—including media, entertainment, healthcare, and agriculture—and each will have its own requirements and uses. Every sector will fall into one of three categories: Enhanced Mobile Broadband (eMBB), Massive Internet of Things (MIIoT), and Ultra-Reliable Low Latency Communication (uRLLC). These three standards will help usher in explosive developments in the industries that use them.

A New Media Paradigm: eMBB, High-Speed Downloads, VR, and AR

Enhanced Mobile Broadband will be the most recognizable to those who're familiar with the commonly used LTE networks and broadband internet connections. eMBB will make it seem as though our computers, smartphones, and other connected devices have been cranked into overdrive, delivering ultra-high bandwidth with a peak speed of 10Gbps (gigabytes per second) and an average speed of 1Gbps. To put things in perspective, current 4G LTE speeds peak at 50Mbps, meaning it would take

a couple of hours to download a 4GB HD movie to watch at home. On a 5G network, consumers will be able to download that same movie in seconds.

While eMBB will improve lives in familiar ways, it will also begin to normalize experiences that are currently inaccessible to most people. Low latency and extremely high data throughput rates will enable better immersive experiences in virtual reality and augmented reality. In the near future, people could be wearing VR headsets that insert them into fully realized 3D worlds while AR glasses could allow users to see data displayed over real-world objects.

On average, one minute of VR consumes 1GB of data. These developments could help to revitalize a dormant, niche marketplace that's populated with AR projects like Microsoft HoloLens, Apple devices, and now, Magic Leap. However, the public's reaction to these technologies and the resulting numbers has been tepid due to a high barrier of entry. The confluence of several factors including price, size, graphical power and 5G network technologies could prove to be the combination that establishes VR and AR as popular media platforms.

MIoT: From Smartphones to Smart Cities

The Massive Internet of Things (MIoT) is another area that could see a great deal of growth thanks to the 5G network. MIoT refers to the tens of billions of devices and machines that require continuous connectivity. This area encompasses smart homes, wearables, cars, and connected cities. The smart market is continuing to mature, but it can only do so gradually because of the data limitations of our current network. For MIoT, a reliable network must be operational 24/7. A momentary lapse in communication could cause service failure.

Think of the current LTE network like a two-lane road. Traffic flows, but there are limitations to how many vehicles can fit on the road and how fast they can travel. 5G networks would metaphorically represent an eight-lane superhighway. MIoT requires low bandwidth and low data rates, but the market for connected things is expected to

total 48 billion devices by the year 2020, with a potential economic impact of \$11 trillion by 2025.

MIoT will probably become the largest sector (measured by the number of connected devices), surpassing mobile phones. Analysts are already predicting key settings where the most value may accumulate: factories, cities, retail, and humans. MIoT will help operations management and predictive maintenance in factories. It will enable connected cities better to monitor public safety, health, traffic control, and resource management.

uRLLC: Eliminating Latency to Save Lives

The final service category for 5G networks is Ultra-Reliable, Low Latency Communication (uRLLC). Latency—the delay before a transfer of data begins following an instruction for its transfer—is perhaps noticeable but unnamable to people uninvested in the “how” of network technology. The most common experience of latency is when people notice a slight delay when pressing a button on a TV remote to change a channel. While it can be a small but bearable annoyance to most, in scenarios where more is at stake—in particular, mission-critical IoT applications—it has hindered several applications and prevented potentially world-shaping innovations.

Autonomous vehicles, for example, have been hampered by latency. A one-second delay could literally mean life or death. Even with edge processing, self-driving cars need to transmit and receive large amounts of data in milliseconds in order to provide safe transportation. A few accidents over the past year have created an uncertain future for autonomous vehicle programs, but uRLLC 5G could help to reinforce public and governmental trust. Self-driving cars use a wide array of sensors (e.g. LIDAR, radar, computer vision, etc.) that need to register data and communicate with other networked sensors that direct its movement—some of which aren't on the vehicle (e.g. traffic control sensors and systems and other AVs) and thus require a uRLLC network connection for near real-time feedback. 5G networks will allow significantly more data to flow between the vehicles and transportation infrastructure,

helping to avoid a collision and better navigate uncertain environments.

But uRLLC's potential applications go far beyond roads and highways. The uRLLC network will help bolster the medical community through better network reliability. Medical professionals will be able to communicate effectively with patients in remote locations that other networks fail to reach. 5G could even enable surgeons to operate robotically on patients from thousands of miles away—thanks again to the low-latency of 5G.

In industrial factories that utilize automation, robotic technology will also expand its capabilities with 5G, allowing indoor connectivity through cellular networks (private and public). Upgraded through 5G, robotic automation applications will become more lightweight and cheaper given the ease with which they can interface with cloud platforms. Machinery, cars, and other components will be assembled at more complicated points where humans previously had to take control. This process, known as “hyper automation,” will fundamentally change how industrial assembly operates. It will create new job opportunities while reducing costs thanks to less labor and improved efficiency.

5G Is a Boon for Business

Over the past century, technology has improved from a steady to rapid pace. Telecommunications has been a focal point of this rapid evolution. The more people that are born into this world, the more ways we develop to connect them. And with the advent of 5G, growth and innovation will change from rapid to explosive for the aforementioned sectors, but the transformation won't stop there. Other industries such as entertainment, healthcare, retail, manufacturing, and transportation will follow a similar growth trajectory thanks to this new network and its delivery systems.

5G presents unprecedented opportunities for innovation and for developing strategic business differentiation. The next-generation network will enable industries to transform their business and to deliver rich, immersive experiences to their customers. There has been no better time to collaborate, transform, and innovate. 🌱

TECHNOLOGY NEWS

102 Operators Have Deployed NB-IoT and LTE-M Networks

Global mobile Suppliers Association (GSA) reports a least one such network in 52 countries worldwide. Further, 20 operators in 19 countries had deployed or launched both NB-IoT and LTE-M. Narrowband IoT (NB-IoT) and LTE-M are low power wide area network (LPWAN) radio technology standards developed by the 3GPP to enable a wide range of cellular devices and services, in particular IoT and machine-to-machine applications.

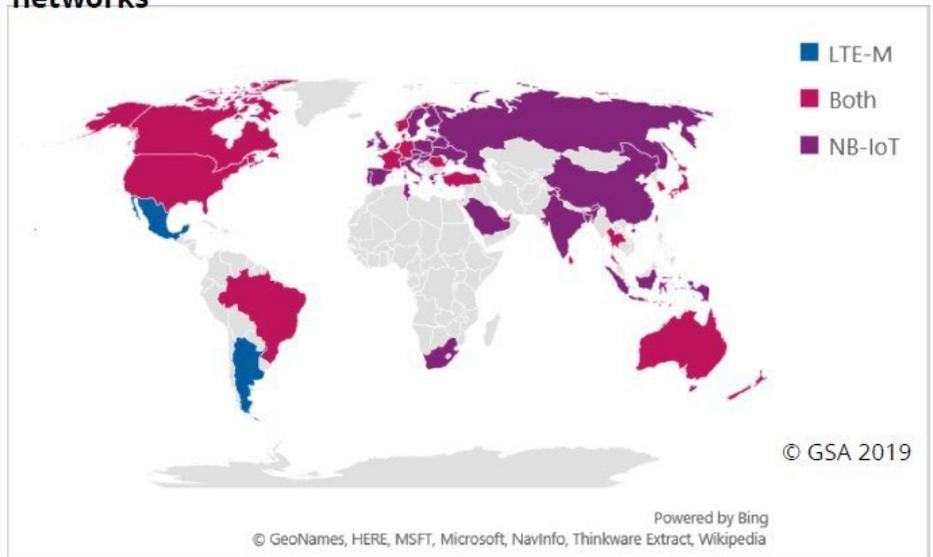
As of the end of March 2019, GSA had identified:

- 149 operators in 69 countries are investing in one or both of the NB-IoT and LTE-M network technologies
- 22 countries NB-IoT and LTE-M networks deployed or launched
- 28 countries are home to deployed or launched NB-IoT networks only
- two countries are home to deployed or launched LTE-M networks
- 140 operators in 69 countries investing in NB-IoT networks; of which 88 operators in 50 countries had deployed or launched their networks
- 60 operators in 35 countries are investing in LTE-M networks; of which 34 operators in 24 countries had deployed or launched

their network. The latest global market status on the wider IoT ecosystem, including NB-IoT and LTE-M, is available for download for free. "The global momentum behind LPWAN deployments is testament to the revenue opportunities which operators are racing to win and monetize in a diverse range of new IoT

applications. "Significantly, it can also be seen as a precursor to operators replacing legacy M2M services such as GPRS-based trackers and preparing the ground for the eventual switch-off of their 2G networks," commented Joe Barrett, President, GSA.

Countries with deployed/launched NB-IoT and LTE-M networks



Industry Must Address Urgent IoT Security Threat

A panel of executives highlighted a number of security threats facing IoT, warning the mobile ecosystem needs to address such issues before it's too late. Chris Autry, CEO of Iothic, said a major part of the problem is that devices at the edge of the network are "quite dumb" and lack the compute



power to support the Advanced Encryption Standard. He continued: "There are no good solutions because we are stuck in a client-server model of computing and that includes the security protocols that go with it. There needs to be a fundamental shift in how we approach these problems and switch the conversation away from the current model." Gregoire Ribordy, CEO of ID Quantique, flagged cost as another problem, noting IoT devices are "extremely cost sensitive" and come with just enough compute power to function. But given the more than 10-year lifespan of IoT devices, Ribordy said companies may need to add more compute power to support new

security algorithms capable of fending off future attacks which use quantum computing to crack encryption. Satellites, which play a key role in IoT networks, were spotlighted by Spirent SVP Stephen Douglas as another liability. He explained the weak nature of satellite signals make them vulnerable to spoofing, which can allow hackers to hijack connected devices. "It's pretty frightening when you think of the dependency we have on satellites today," he said. "This is going to be a critical thing for things like smart factories and for the transportation networks. We're going to have to build to connect those factories in the future."

KT and Samsung Record 1Gbps 5G Speeds as Consumer Launch Approaches



South Korean mobile network operator KT Corp and local vendor Samsung Electronics claim to have successfully achieved downlink speeds of 1Gbps using the former's infrastructure in Seoul, over which it has been providing a '5G mobility commercial service' to enterprise users since 1 December 2018 via a collaboration with Samsung's Networks Business unit. In a press release regarding the development, it was noted that KT has been using spectrum in the 3.5GHz band for its 5G network, which is comprised of Samsung's 5G NR end-to-end network solutions, including 5G radio and virtual core (vCore), supporting 4G LTE and 5G simultaneously. The 1Gbps downlink speeds, meanwhile, were said to have been achieved using

a Samsung Galaxy S10 5G smartphone, which is set to be released commercially on 5 April. With commercial 5G services for consumers expected to be introduced by KT next month, the cellco has claimed that on the back of the speed achievement its network will be ready for 'end-user mobility service' in 85 cities across the country – including the Seoul metropolitan area – by end of March 2019. It said that this includes a planned 5G service coverage expansion 'throughout a number of major national highway and high-speed railways (KTX and SRT) connecting cities', while coverage is also expected to be gradually extended to '464 colleges and universities, subways, landmark buildings and parts of mountainous areas'.

Fixed Broadband Subscribers to Hit 1.2 Billion by 2025

There will be 1.2 billion fixed broadband subscribers by 2025, according to predictions in a new report from the Broadband Forum and Point Topic. The research suggests that the ongoing trends of "booming deep-fiber deployment" and accelerating broadband penetration in developing markets will drive broadband growth through to 2025. The forecast states that some variant of fiber – either Fiber-To-The-Home (FTTH), Fiber-To-The-Premises (FTTP) or Fiber-To-The-Building (FTTB) – will be used by 59% of fixed broadband subscribers globally by 2025. While broadband-capable device proliferation and connectivity paved the way to the 1 billion broadband subscriber milestone in October, emerging drivers such

as 5G, meshed Wi-Fi, and new advanced services will be key to continued growth, the report notes. The report also examines the impact of 5G, predicting that fixed-mobile convergence will mean that the next billion subscribers could blend wireless and fixed subscriptions. "With 5G on the horizon and new Internet of Things devices and Over the Top services increasingly becoming a part of subscribers' everyday lives, this new analysis looks at how the fixed broadband market and the technologies within it are evolving to meet this demand," said Oliver Johnson, CEO at Point Topic. "As we look towards the next billion broadband subscriptions, fixed lines will continue to play a significant role. We expect to see more convergence between

fixed and mobile lines as consumers look for a seamless, high-quality connectivity experience that is available anywhere, anytime." Geoff Burke, CMO of Broadband Forum, commented at the time, "Two years ago, ten of the world's biggest operators came to us with their concerns that the 5G infrastructure which was being developed would not let them take advantage of both their wireless and wireline networks. "Today, we are able to deliver a set of recommendations which will not only address how the 5G core can be evolved to support the fixed networks of these operators but provide them with the capabilities to launch new innovative combined subscriber offerings."

GSA Sounds 5G Security Warning

The Global mobile Suppliers Association (GSA) added its voice to the numerous authorities and organizations calling for security best practices to be adopted in the rollout of 5G networks. In a statement the organization warned expected growth in the number of connected devices and expansion of the types of applications new infrastructure will support increased exposure to potential network security

threats. GSA president Joe Barrett said: "5G is not just about faster speeds, it's also about an order of magnitude increase in the number of connected devices and potential applications. This significantly increases the potential attack surface, and means that adopting security best practice will be critical to building models of trust between the parties using and supplying 5G networks." Alongside the comments

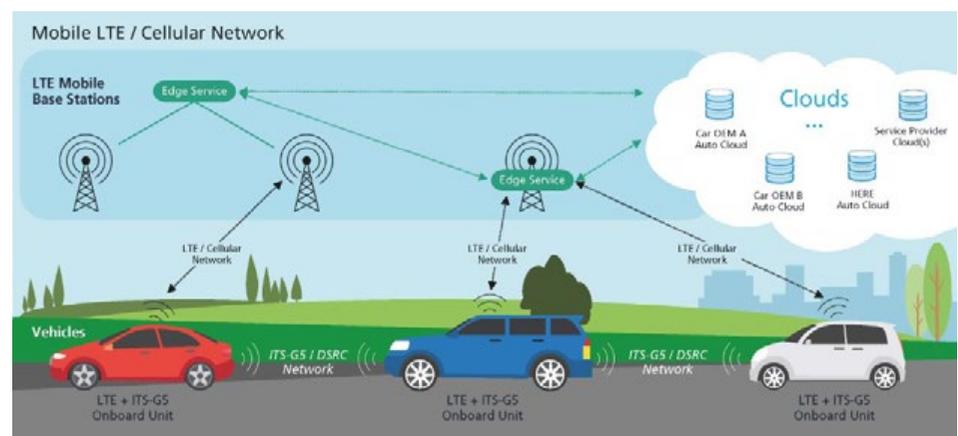
the organization, which counts Nokia, Samsung and ZTE among its members, released a report outlining facets of 5G network architecture which are set to enhance security. Over the last two years organizations from across the mobile industry have regularly voiced the need for tight security in the 5G era from pledges related to IoT devices to security on the network itself.

Germany Completes Its MEC-Based Connected Vehicles Test Project

Local cloud computing (Multi-access Edge Computing - MEC) is a key enabling technology for connected driving, specifically for driving safety. It is vitally important that the industries involved in connected driving work closely together to turn the concepts into sustainable business for all parties involved. These are the main conclusions of the Car2MEC project after two years of intensive trialing and testing by Continental, Deutsche Telekom, Fraunhofer ESK, MHP and Nokia on the A9 motorway digital test track in Germany. Car2MEC was funded by the Bavarian Ministry for Economic Affairs. The goal of the project was to gain insights into the value of MEC for connected driving with regards to technology and network architecture as well as economically. The project partners tested a number of different use cases on the A9 motorway, including "emergency warning", "end of jam warning", "variable speed limit assistant" and "HD maps". Ronald Hain, backend team leader, Interior Systems & Technology, Continental: "In the future, Multi-access Edge Computing will be a very important communication technology for the connected vehicle. By closing the gap between local real-time applications and cloud services it will allow us to enhance automated driving and enable vehicles to cooperate with each other. In addition, local services effectively utilize the data rate of LTE or 5G networks. Continental is currently working on a vehicle architecture that takes this communication technology into account." Deutsche Telekom deployed a project specific infrastructure with two locally separated MEC in the test area at the A9 motorway. The testbed shared resources with the LTE live network and had been operated for 12 months allowing for extensive test drives. "The project results validate the performance of edge computing over our 4G networks as a potential enabler for automotive cases that require low latency and ultra-high reliability," says Alexander Lautz, Senior Vice President 5G, Deutsche Telekom. "Going forward, we will continue to collaborate with partners in the automotive sector on the evolution of the technology and its application in connected and automated driving solutions that will deliver the best driving experience." In the project,

Fraunhofer ESK's hybrid communication units enabled time-sensitive applications for connected vehicles with proven, standardized protocol and message sets. A highly efficient distributed messaging service (GeoService) deployed on the multi-access edge nodes provided low-latency connectivity between the vehicles and a direct link to localized services. In combination with Fraunhofer ESK's adaptive networking algorithms, which select the most suitable communication path at runtime, the complementary strengths of different technologies can be exploited to provide optimized Quality-of-Service (QoS) for each application and context. Karsten Roscher, senior scientist at Fraunhofer ESK: "This project gave us the chance to evaluate and enhance our hybrid ETSI ITS solution in a commercial cellular network with future 5G additions in mind. While the edge cloud improved end-to-end latency by more than 20ms, the 4G radio access network is still a limiting factor for more demanding future services. However, we believe the combination of edge cloud and 5G will shape a completely new landscape of connected and distributed applications." MHP provided insights into MEC's value for connected driving from a business perspective. MHP identified critical success factors for potential commercial ecosystems driven by the new technology. The business opportunities MEC offers to the automotive industry are ambiguous, yet promising. Several possible areas of action were identified in the project. Cooperation and partnerships, in addition to standardization and a clear value proposition for each stakeholder's investment, are seen as crucial for future development. Olaf Kleindienst, partner

at MHP: "Everybody is talking about the connected car and, in some ways, the connected car is already there. But it still has some way to go and many questions remain, particularly around the fully connected car. The fully connected car represents a new environment for the automotive industry and the established key players must reinvent themselves, with new business models. We see projects like Car2MEC as an excellent opportunity to think ahead and discuss questions around this new environment at an early stage, with different perspectives." Nokia's Multi-access Edge Computing technology (MEC) brings cloud computing resources closer to the roadside, enabling much faster reaction times (latency) in the network compared to centralized cloud architectures. This is crucial for applications like emergency warning or end-of-jam warning where milliseconds can make a big difference. The testing confirmed that time critical information can be delivered from one car to another in less than 30 ms in an LTE network combined with a MEC based Edge Cloud. Also, the performance of latency critical and data intense applications like HD positioning and maps improved significantly when supported by an Edge Cloud infrastructure. Uwe Puetzschler, Car2MEC project lead and head of Car2X at Nokia: "The results from this project mark a big step forward on the way to safe and automated driving. We have demonstrated that the Edge Cloud on top of 4G and 5G networks allows to deploy distributed applications that meet the requirements of the automotive industry in terms of latency and reliability. This will accelerate a commercial deployment of the technology." 📍



ARTICLE

Dynamic 5G Networks Key to Building Tomorrow's Digital Economy

With digital transformation taking place across all industries as the fourth industrial evolution unfolds before our eyes, momentous shifts in next-generation mobile cellular communications are set to change connectivity as we know it.

The world's connectivity needs are changing - global mobile data traffic is expected to multiple by five before the end of 2024. Particularly in dense urban areas, the current 4G networks simply won't be able to keep up.

Throughout the last few decades, each new generation of wireless service has resulted in mobile technology reaching new heights to offer better quality services and enhanced customer experiences. For mobile operators, each evolution has culminated in a rise in their operation effectiveness.

In the context of 5G's evolution, this notion is even more apparent. The world's connectivity needs are changing - global mobile data traffic is expected to multiple by five before the end of 2024. Particularly in dense urban areas, the current 4G networks simply won't be able to keep up. Therefore, early adoption of 5G is crucial to building the digital economy of the future.

While the emergence of 4G enabled networks to support voice and data IP and faster broadband for an enhanced mobile experience, 5G networks will expand broadband wireless services like never before.

New technology brings new capabilities

In 2019, commercial 5G networks are expected to be deployed which will drastically redefine the telecommunications landscape. With this evolution, telecom operators are forecast to undergo a raft of dynamic changes.

5G commercial networks are starting to go live. The first use cases are enhanced mobile broadband bringing better experience for smartphone users and fixed wireless access, providing fiber speeds without fiber to home. In addition, 5G smartphones will be available in 2019 as well.

Being able to download a full-length HD movie in seconds and share your wow-moments with friends – that's just the beginning. The true value of 5G is the opportunity it presents for people, business and the



Chafic Traboulsi

Head of Networks
Ericsson Middle East & Africa



world at large: industries, regions, towns and cities that are more connected, smarter and more sustainable. With these changes come unprecedented opportunities.

While 5G will empower consumers and revolutionize their connected experience with higher speeds and lower latency, opportunities and benefits are aplenty for mobile network operators.

5G will provide capacity to handle growing data traffic, as well as present opportunities for operators to grow top-line and improve their consumer business. As networks evolve and technologies like Massive MIMO and 5G New Radio are introduced, cost per gigabyte will decrease. This cost efficiency will grow stepwise with the continued capacity improvements in 4G.

As highlighted in the most recent Ericsson Mobility Report, we project 5G to reach more than 40% population coverage by 2024, with an expected 1.5 billion subscriptions.

The rapid uptake expected for 5G applications is significant when compared to previous generations of mobile, with the next generation forecast to be the fastest generation ever to be rolled out on a global scale.

What this means for network operators is that there will be an unprecedented number of users on their networks. Their ability to take customers beyond mobile internet to power Internet of Things (IoT) and critical communications segments, such as real-time communications sensors, healthcare monitoring systems or even drone and autonomous car navigation, will be unparalleled compared to previous connectivity iterations.

The speed of 5G device penetration will determine how quickly operators can benefit from 5G capabilities. With a proactive approach on the evolution to 5G, it's clear that the technology can offer significant economic rewards.

One thing we learned from the introduction of 4G is that first movers grow faster. Operators who rolled out 4G ahead of competitors enjoyed increased revenue and market share. To take advantage of this window of opportunity operators need

to set their 5G deployment and marketing strategies as the commercial roll-out of 5G is approaching.

5G to boost ICT business & innovation

With the 4G era we unlocked enhanced mobile internet. Now with 5G we have the means to power a barrage of new use cases as tactile internet revolutionizes network capabilities and consumer and enterprise applications.

5G is enabling a new wave of innovation. It has the potential for changing the world, further powering the hottest trends in tech today: IoT, AI (Artificial Intelligence) and AR (Augmented Reality) – among many more. The short answer to why 5G is a game changer: it will improve your network connection dramatically. You won't have to deal with disruptions when sharing videos from crowded arenas, nor will high-quality videos on your newsfeed cause frustration from all the buffering.

Instead, you'll get a faster, more stable, more secure connection – along with new services and experiences, just around the corner. More efficient capabilities and vastly increased capacity means you'll enjoy better performance than ever before. The staggering increase in bandwidth throughput and network capacity opens up an entirely new world of use cases, especially for enterprise segments. Globally, we expect 5G driven innovations to drastically improve edge and cognitive computing.

With the growth of 5G networks, this will intensify the number of IoT and Machine to Machine (M2M) connections and develop tactile internet functions beyond mobile internet to unlock endless possibilities.

The number of cellular IoT connections is expected to reach 4.1 billion in 2024. As the IoT application market widens, the use cases will become more advanced. This means that optimized voice quality, more accurate device positioning and device mobility support to grow rapidly.

What does this mean for service providers?

The introduction of 5G will make it possible for communications service providers to improve their business in various ways. Just as 4G shook up the landscape, whereby

data packages became more important than voice and SMS packages, 5G brings opportunities for communications service providers to offer new services. 5G will also improve cost-efficiency. Ericsson research on enhanced mobile broadband shows that evolution to 5G will enable 10 times lower cost per gigabyte than current 4G networks.

Meanwhile, Fixed Wireless Access (FWA) can provide connectivity for households and businesses. Research demonstrates that the investment payback time is under two years when connecting underserved suburban households on the existing mobile wireless network.

In the Middle East and Africa, the potential for dynamic 5G networks is coming to life. As 5G hits the market, the mobile ecosystem will become larger and more widespread and extensive than ever.

5G also presents an opportunity for operators to tap into revenue streams emerging from the digitalization of industries. Enabling new use cases, new services new business models and new eco-system, service providers can benefit from up to \$619 billion market opportunity globally in 2026. In other words, this represents the chance to add up to 36% growth in revenues across this period.

Momentum is building in many markets as service providers accelerate their plans for 5G rollout. In the Middle East and Africa, the potential for dynamic 5G networks is coming to life. As 5G hits the market, the mobile ecosystem will become larger and more widespread and extensive than ever.

Combining revolutionary levels of efficiency with higher capacities to send data: that's 5G. Not only will it tangibly benefit you, it's here to improve societies across the globe, and it's equipping industries to do many things which – not too long ago – they could only envisage. Better yet, this new era of advancement is just getting started. 

Design and deliver your 5G strategy with A.T. Kearney



With our global expertise and extensive experience in the SAMENA region, we are supporting leading telecom operators to navigate the transition to 5G and maximize returns on investments through our holistic approach:

- Assessing 5G use cases for your markets to accelerate monetization
- Designing your commercial proposition and developing 5G ecosystem partnerships
- Defining your 5G technology strategy and infrastructure deployment plans
- Developing your sourcing strategy and support negotiations with technology vendors

ARTICLE

In the Pursuit of 5G, Technology Comes Last



Izhar Ahmad

Director - Industry Affairs & Communication
SAMENA Telecommunications Council



Technologies and concepts our ears have grown accustomed to hearing in bits and pieces since the days of 3G are about to converge and consolidate, to deliver life-changing experiences in the impending era of 5G. This consolidation, when contextualized properly, of course, will continue to improve further beyond 2030 when advances in quantum technologies may give way to "6G", one day, to occupy the same space in our future industry discussions

The promise of 5G rests on its marvelous engineering capabilities achieved, especially with respect to the use of new spectrum, due to which signal directionality, spectral efficiency, extremely low signal path loss, precision in data flows, and self-regulating power management modes are made possible.

as 5G does today. For now, however, "intelligent connectivity", which is manifesting itself through artificial intelligence powered by real-time factual data collection and data analytics devices that operate in an internet-of-everything environment, and is being brought to life through fifth-generation transmission technologies and infrastructure, is where our perceptions and preparations currently stand – against a complex digital communications background.

The promise of 5G rests on its marvelous engineering capabilities achieved, especially with respect to the use of new spectrum, due to which signal directionality, spectral efficiency, extremely low signal path loss, precision in data flows, and self-regulating power management modes are made possible. This has allowed for the technological capability of 5G to connect a thousand more diverse devices per meter at blazingly superior data speeds than would be possible with any previous generation technologies. Recognizably, considerable amount of work has been put into engineering 5G to overcome the existing spectrum band congestion issues as well. Seen from a non-technology perspective, one of the best things about 5G is the sheer transformation in collaborative approaches that it could catalyze; and stakeholders are quickly beginning to understand that 5G will not just be an advanced cellular technology, which humans would appreciate through the speeds

it offers. On the contrary, 5G will serve as the bedrock on which an entirely new, perceivably complex ecosystem of digital systems, services, human enablement methods, value-chains, and business models will be built, and that a new road will be paved with it for carrying out human progress over the next decades. It suffices to say, nonetheless, that the 5G ecosystem would only remain an ecosystem as long as there is sustainability, collaboration, and symbiosis in it.

Gradually, building the 5G ecosystem and readying it for human progress – which transcends beyond worries of being replaced by machines and, instead, demands inclusion and empowerment of all humans – would mean developing methodologies and opportunities, or “use cases”, for bringing together telecom operators, regulators from across sectors, municipal governments, and just about every digitally-invested entity or decision-maker who will be or needs to be a part of the sea-change being brought forth by 5G, to help, for example: accelerate governments’ transition to a more digitized and readily-available state; improve land mapping; water and soil testing; food production and quality management; autonomous driving; consolidating cybersecurity needs and addressing data demands through 5G’s back-haul system across the digital infrastructure from edge to core, among others.

Initially, however, the focus of 5G in the SAMENA region, as is visible from preparations underway in the UAE, Saudi Arabia, Bahrain, Oman, Lebanon, and Bahrain will be on leveraging the existing 4G (LTE) infrastructure investments to offer enhanced mobile broadband and fixed wireless access, while the Industry conjures up new applications that will require 5G Core. It suffices also to say, that timely availability of 5G user devices, compatible with spectrum bands that telecom operators have lately acquired for this purpose, will have a direct impact on the pace of this initial deployment of 5G. To move forward in proliferating 5G in a meaningful way, however, discussions on 5G must start with an acknowledgment that at least 50% of the world remains

completely disconnected from the Internet, which has brought substantial positive benefits to the connected world. This human dimension of being connected to technology necessitates that, since 5G will facilitate and expand new data streams of all kinds, which will be used for human advantage, first we develop multi-dimensional frameworks (including of policy, incentivization, implementation, regulation, etc.), which should effectively cater to these streams of data to allow for new human experiences to happen. Being at a critical juncture in digital and societal transformation, digital literacy follows next, as without it, policy and implementation frameworks are a challenge to implement. Ultimately, we should demand of ourselves to accelerate all industry efforts to create relevance and communicate meaningfulness of available technologies, and translate technology deployments into value for humans, through the language and contexts they understand.

This human dimension of being connected to technology necessitates that, since 5G will facilitate and expand new data streams of all kinds, which will be used for human advantage, first we develop multi-dimensional frameworks (including of policy, incentivization, implementation, regulation, etc.), which should effectively cater to these streams of data to allow for new human experiences to happen.

It is also important to recognize that the transition to 5G provides opportunities to improve security. 5G should allow us to put into action all accumulated insights and experiences into incorporating security and privacy by design. Doing so is necessary for dealing with imminent data complexity that plethora of human and

machine connections are going to create, but also to ensure that the human need for protection, preparation for the future, privacy, and preservation of dignity is fulfilled. This need is of special importance with regard to the protection of children; an imperative that the ITU, through its Child Online Protection (COP) Program has defined very well. Moreover, this need is also an essential element of the human awakening. Human rights due diligence practices need to become an essential part of our industry discussions, and should form the blue-print for developing and deploying the 5G systems and services, which ultimately will constitute intelligent connectivity; hopefully, intelligent enough to anticipate and mitigate negative impacts on humans.

Having entered the fourth industrial revolution, 5G, as a whole, serves as a much-needed opportunity to start afresh in the way we think, make policies, define measurable action plans, and align our expectations with the ground realities of the environment, in which we now live and want our children to thrive in the future.

It is upon us to bring the benefit of technological advancements in data transmission technologies to transforming lives of humans. Since 2G, the Industry has struggled with many archaic approaches in how to frame policies and how to regulate. Fortunately, industry stakeholders across the board now recognize that our fifth-generation decision-making should be as futuristic as has been our technological progress, which does demand collaboration among all concerned entities and platforms. We need to plan for the 5G future based on what we have learned from 1G, 2G, 3G, and 4G. For human development, because transition to 5G opens up new horizons, all good intentions and public and private-sector efforts should be exerted in synch; toward developing capabilities, which advanced technologies can facilitate, tremendously. Our collective progress, which is materializing in the form of technology infusion, will ultimately be measured through the value and meaningfulness we create for fellow humans. And 5G holds the promise of allowing this to happen. 🌱

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REGULATORY NEWS

European Commission Weighs in on 5G Security

The European Commission (EC) has released a set of operational recommendations that target cybersecurity across 5G networks in Europe. The recommendations are the result of a March 22 European Council meeting, in which heads of state called for a “concerted approach to the security of 5G networks.” The recommendations call for each EU member state to complete a national risk assessment of 5G network infrastructures by the end of June 2019, and then update existing security requirements for network providers to include conditions for ensuring the security of public 5G networks. The EC said such measures

are meant to protect the economies, societies and democratic systems that’ll be impacted by 5G technologies moving forward. It asks that member states exchange information with one another and the European Agency for Cybersecurity (ENISA) in order to complete a coordinated risk assessment by October 2019. Member states will then decide upon a set of measures, ranging from certification requirements, tests, controls and the identification of products or suppliers that are considered potentially nonsecure. Finally, it asks member states to further collaborate with industry stakeholders to

develop a dedicated EU-wide certification scheme for 5G, which should then become mandatory for 5G suppliers. “The resilience of our digital infrastructure is critical to government, business, the security of our personal data and the functioning of our democratic institutions,” said Commissioner Julian King, who is in charge of the Security Union, in a statement. “We need to develop a European approach to protecting the integrity of 5G, which is going to be the digital plumbing of our interconnected lives.” The measures are in response to growing concern among leaders globally over the vulnerabilities of 5G networks built using too few suppliers. The U.S. government has launched a lobbying campaign against China-based 5G vendor Huawei over security concerns that has resulted in a handful of countries banning Huawei products from 5G deployments. In Europe, countries have been less interested in banning Huawei altogether, opting instead to shore up security guidelines around 5G networks. Germany’s telecom regulatory body, the Federal Network Agency (BNetzA), for example, announced earlier this year it would not ban Huawei products from 5G deployments, which prompted a U.S. ambassador to threaten to withhold intel from Germany.

5G

Common EU approach to security of 5G networks

#DigitalSingleMarket



Broadband Forum Explores Gateway Disaggregation to Improve Network Scalability

The aim is to facilitate broadband networks gateways’ (BNG) scalability by creating a more agile architecture. Disaggregation also simplifies network operation: without it operators must deploy and manage multiple BNGs across many locations that are closer to the network’s edge to address load spreading. These factors have created problems in scaling control and user planes, as well as geographical-related issues like fragmented IP-pool management, underused control planes, and complex operation and management of software upgrades and service provisioning. Hence

the project will define the architecture and requirements for a disaggregated BNG control and user planes, which separate the two planes. This will enable centralized locations for configuration and managing IP addresses, leading to faster delivery of new services. The work will also ensure the planes can be easily scaled to meet bandwidth demand. “As demand for both broadband and bandwidth-hungry video applications grows, the disaggregation of the BNG for scalability is critical to mitigate issues created by distributed BNG deployments,” said Kevin Foster, Chairman

of Broadband Forum. “Over the years, BNGs have also had to evolve to support new functionalities such as management of multiple types of accesses, transport encapsulations and customers.” This work will ensure flexible scalability through a simplified and agile architecture.” For more information on Broadband Forum’s BNG Disaggregation project and other areas of focus within the Access & Transport Architecture Work Area, watch this summary video from Project Stream and Work Area Director Dave Sinicrope, of Ericsson.

UK Government Offers €1.17 Million for 5G Infrastructure Innovation

The UK government is offering a share of £1 million (€1.17 million) in funding to businesses that advance 5G infrastructure or user experiences. The funding is provided through Innovate UK and the CELTIC-NEXT program, which is part of the EUREKA network that aims to boost international partnerships in market-driven R&D. To be eligible for the funding,

projects must provide either innovative 5G infrastructure technologies that make use of artificial intelligence (AI) in network operation or multi-access edge computing, or applications that use 5G networks for new or improved user experiences. The government highlighted that this includes projects which feature satellite networks or services integrating satellites. Within

these guidelines, projects must focus on one or more of the following:

- AI in network operation
- Multi-access edge computing
- Internet of Things
- Tactile internet
- Mission-critical applications
- Infotainment and mobile services such as advanced media streaming
- Immersive content in industrial environments.

Projects can have total eligible costs between £400,000 (€467,000) and £2 million (€2.34 million), and organizations are advised to aim for grants around £500,000 (€584,000). Projects must start between October and December 2019 and last between 12 to 24 months. The competition opens on 1 April 2019 and closes at midday on 29 May 2019. UK-based organizations of any size are eligible to apply. A government statement said: "Although 90% of UK households have access to the internet, 2.7 million homes remain unconnected. Smartphones, which are the most widely-used means of accessing the internet, could provide the solution, connecting the entire country through the 5G network."



UK Urged to Beef Up Digital Laws

UK laws must be updated for the digital age to encourage competition at a time when tech giants including Google and Facebook are becoming dominant, an independent review panel concluded. In a statement, HM Treasury said Harvard professor and economics expert Jason Furman, who headed the panel, believes setting up a new competition unit and strengthening outdated laws would enable more companies to enter the market on a more equal footing, usher in a new wave of innovation, and foster the creation of new social media and online search platforms. Furman's panel recommended a digital markets unit should have expertise in technology, economics and

behavioral science, along with sufficient legal clout. "My panel is outlining a balanced proposal to give people more control over their data, give small businesses more of a chance to enter and thrive, and create more predictability for the large digital companies," Furman explained. The approach will "deliver an economic boost driven by UK tech start-ups", he added. The Treasury stated the recommendations included the creation of a code of conduct so "the largest digital companies know the competitive rules of the game"; giving regulators more powers to tackle illegal anti-competitive practices; and amending merger rules so the Competition and Markets Authority can

prevent tie-ups "likely to damage future competition, innovation and consumer choice". Chancellor of the Exchequer Philip Hammond said the government will closely scrutinize the panel's proposals "before responding later this year, setting out how the government will implement the changes needed to ensure our digital markets are competitive and consumers get the level of choice they deserve". Earlier this week, US Senator and 2020 presidential candidate Elizabeth Warren unveiled a plan to split up technology giants as part of a bid to spur innovation and competition.

German Regulator Publishes Framework for Awarding Local 5G Licenses in 3.7-3.8 GHz Range



The German Federal Network Agency has published the framework conditions to award 5G frequencies for local use. The spectrum in the 3,700-3,800 MHz band has been set aside for applications such as industrial automation, agriculture and forestry and will be allocated upon application, without an auction. The regulator is releasing the framework ahead of the auction of the 2 GHz and 3.4-3.7 GHz bands later this month, so bidders know the conditions for the adjacent frequencies. The 3.7-3.8 GHz range has been set aside for use in factories and campus networks, and the winners must coordinate with the mobile network

operators to ensure efficient use and no interference with other applications. The Bundesnetzagentur will allocate blocks of 10 MHz for use based on ownership or rights to specific property; the spectrum may not be used for public networks. The Agency said it received 50 comments from industry representatives, businesses and political institutions to define the future allocation of the frequencies. The vast majority support a restricted allocation of the spectrum, while approving the decision to lift the separation between indoor and outdoor applications. The application process will start in the second half of 2019.

German Regulator Revises Network Security Rules

The German regulator, Bundesnetzagentur (BNetzA), has published new security requirements for telecoms networks and services. The update comes ahead of Germany's 5G auction later this month and amidst the ongoing row about the use of Huawei equipment in telecoms networks. "We regularly adapt the applicable security requirements to the current security situation and the state of the art," said Jochen Homann, President of BNetzA. "The security requirements apply to all network operators and service providers and they are technology-neutral, covering all networks, not just individual standards such as 5G." The US has called on Western countries to exclude Huawei from their 5G networks, claiming the Chinese company poses a threat to national security. No individual companies are mentioned in BNetzA's update but the proposed

rules appear to represent a tightening of rules and requirements for all vendors – including Huawei, as long as the criteria are met. Specifically, the additional requirements say that systems may only be obtained from "trustworthy suppliers" who can provide assurance that they comply with national safety regulations and telecommunications secrecy and privacy rules. Safety-critical components will require certification recognized by the Federal Office for Information Security (BSI) and employees working in safety-related areas will require certified training. "It must be demonstrated that the hardware tested for selected, safety-related components and the source code at the end of the supply chain are actually used in the products used," the guidance states. BNetzA and BSI will provide a definition of what constitutes a critical core



component. The update also stipulates that "monocultures" should be avoided. Telecoms companies should use network and system components from different manufacturers, rather than a single provider, the update says. The rules also state that network traffic will need to be continuously monitored for abnormalities. BNetzA will release a draft of the proposed new rules for industry feedback soon.

Poland Could Offer Lower Fees in Return for Celco Network Investment

Poland's Ministry of Digitization (Ministerstwo Cyfryzacji, MC) has put forward proposals which would enable mobile network operators (MNOs) to benefit from reduced regulatory and spectrum fees in return for improving coverage on their

networks. Telko.in reports that the Ministry has put forward a draft amendment to the government's new Act on Supporting the Development of Telecommunications Services and Networks (the so-called 'Mega-Act') under which the country's

telecoms regulator, the Office of Electronic Communications (Urząd Komunikacji Elektronicznej, UKE), could negotiate with operators over the rollout of infrastructure to unserved and underserved areas in exchange for lower fees.

House of Lords Recommends Creation of New Digital 'Super-Regulator'

The House of Lords Communications Committee has called for a new regulatory framework for digital services to hold big technology companies accountable to a legally-enforceable set of shared principles. The Committee's report, 'Regulating in a digital world', concludes that digital industry regulation has failed to keep pace with the role of digital technology in our lives, with more than 12 UK regulators responsible for the digital market but no single body with complete oversight. This has resulted in major technology companies failing to adequately tackle online dangers as regulation of the sector is fragmented with gaps and overlaps. The report recommends the creation of a new Digital Authority to regulate the digital world based on set of 10 principles. This new Digital Authority will co-ordinate regulators, continually assess regulations and make recommendations about any additional

powers needed to fill gaps. It would report to a new joint committee of both Houses of Parliament. The 10 principles guiding all regulation of the internet would include transparency, accountability, respect for privacy and freedom of expression. The Committee also wants a duty of care to be imposed on online services hosting and curating content which can be uploaded and accessed by the public, with Ofcom's remit expanded to enforce this duty of care.

It also wants online platforms to adopt a new classification framework, similar to the one operated by the British Board of Film Classification (BBFC), and to make more investment in effective moderation systems. The report also recommends that users should have more control over the collection of their personal information, with maximum safety and privacy settings set as the default.



The European Union Risks Undercutting Europe's 5G Future with Its Connected Car Legislation

The European Commission made a technology choice in its Connected Car Legislation that, in the view of the GSMA, undercuts its own 5G Action Plan and jeopardizes its digital competitiveness; the Commission has chosen to ignore technological innovation and choice, and instead stick with an outdated wi-fi (802.11p) technology for connected vehicles. The GSMA urges EU Member States and the European Parliament to reject the proposed rules that favor wi-fi technology to connect cars across Europe, and instead maintain flexibility to encourage the deployment of more advanced technologies, like Cellular-V2X (C-V2X) connectivity. The EU's 5G Action Plan calls for all "major terrestrial transport paths [to] have uninterrupted 5G coverage by 2025." Rather than incentivizing this outcome, the new legislation – the Delegated Act on Cooperative Intelligent Transport Systems (C-ITS) – deals a blow

to 5G rollout plans across Europe. As C-V2X is a key building block for future 5G networks, and as connected cars are one of the most important 5G use cases, this decision to prioritize 802.11p will hinder 5G deployment in Europe. The GSMA fully supports the purported aim of this legislation to make roads in Europe safer and smarter to bring down the number of road fatalities. However, the Commission's plan to double down on an ageing technology for C-ITS does a disservice to European drivers and industry. The Delegated Act on C-ITS fails to take into account more recent technological innovation. C-V2X provides more security, range and quality of service than 802.11p. It is, therefore, no surprise that C-V2X is quickly becoming the worldwide standard for communication between vehicles and with roadside infrastructure. In fact, North America and China are already moving forward with C-V2X, which will allow

them to move to connected driving more quickly, cheaply and safely than Europe. Although the Delegated Act on C-ITS contains a review clause to allow for new technology to be recognized, its decision to start with already outdated technology as the standard and then demanding interoperability will lock out C-V2X from Europe for the foreseeable future, while wasting billions of euros in taxpayers' money on roadside infrastructure investments. The GSMA therefore urges EU Member States and the European Parliament to reject the Delegated Act on C-ITS. "This piece of legislation relies on a biased view of technology and impedes innovation," states Afke Schaart, VP & Head of Europe of the GSMA. "If the EU stays on this road, it will isolate itself further in the global 5G race and severely harm 5G investment in Europe."

TRAI to Consider BSNL, MTNL 4G Spectrum Allocation

The Telecom Regulatory Authority of India (TRAI) has now received a request from the Department of Telecommunications (DoT) to provide recommendations on the allocation of 4G spectrum to state-backed providers Bharat Sanchar Nigam Limited (BSNL) and Mahanagar Telephone Nigam Limited (MTNL). The Economic Times quotes TRAI Chairman Ram Sewak Sharma as saying that the regulator has received a reference on the allocation and 'will issue a consultation paper and hold [an] open house discussion on it soon.' The announcement follows on the heels of a statement from an unnamed TRAI official earlier this week which challenged the DoT's claims that it had handed the matter to the watchdog. BSNL and MTNL have requested additional frequencies for 4G services, but under rules imposed in 2012 spectrum rights may only be sold via a public auction. The DoT has sought the TRAI's opinion on whether government-owned entities are exempt from this rule and could be handed the frequencies via administrative allocation. The TRAI's opinions on pricing, frequency bands and

amount of spectrum to be allocated were also sought. BSNL has request 2100MHz spectrum in 19 of its 20 service areas – all except Rajasthan – whilst MTNL, which serves the remaining two circles, Mumbai and Delhi, has requested spectrum in the 2100MHz band for the former, and the 1800MHz range for the latter.



US 24GHz Auction Surges Past USD1Bn Mark

Data provided by the Federal Communications Commission (FCC) has confirmed that 'Auction 102' – the regulator's sale of Upper Microwave Flexible Use Service (UMFUS) licenses in the 24.25GHz-24.45GHz/24.75GHz-25.25GHz (24GHz) band – surpassed the USD1 billion mark on Friday 22 March, reaching USD1.094 billion after just seven days of bidding. The bidding activity

shows no sign of slowing down, with offers reaching USD1.410 billion yesterday (Monday 25th March), meaning that the process has now doubled the USD702.6 million raised in the FCC's auction of 28GHz spectrum ('Auction 101'), which took place between November 2018 and January 2019. The 38 registered bidders include the likes of AT&T (bidding as AT&T Spectrum Frontiers), Verizon Wireless

(bidding as Cellco Partnership), T-Mobile US, US Cellular and Windstream. An additional bidder, ATI Sub, is said to be an affiliate of Sprint Corp. Participants targeting the US territories of Guam and the Northern Marianas Islands, meanwhile, include DOCOMO Pacific and GTA (bidding as TeleGuam Holdings).

FCC Pauses Shot-Clock for T-Mobile-Sprint Merger

The Federal Communications Commission (FCC) has paused the informal 180-day transaction 'shot-clock' relating to its review of the proposed merger between



T-Mobile US and Sprint for the second time since the transaction was submitted for regulatory approval on 18 July 2018. The previous stoppage occurred between September and December last year. The watchdog notes that the two companies have provided officials with 'significant additional information regarding their network integration plans for 2019-2021, an extension of their previously filed merger simulation analysis to cover the years 2019-2021, and additional information regarding their claims related to fixed wireless broadband services.' The clock

was stopped on 7 March and interested parties may submit comments until 28 March. The clock will resume – at Day 122 – on 4 April. As previously reported by TeleGeography's CommsUpdate, in April 2018 T-Mobile and Sprint entered into a definitive agreement to merge in an all-stock transaction. They seek to create a company which will be 41.7% owned by T-Mobile's parent Deutsche Telekom (DT, which would have overall control) and 27.4% owned by Sprint parent SoftBank Group Corp, with the remaining 30.9% in free float.

3GPP Working Group Prepares “CyberCAV” 5G Specifications for Vertical Domains

3GPP Working Group SA1 has recently concluded its work on 5G service requirements for cyber-physical control applications in vertical domains (cyberCAV) with the approval of Technical Specification (TS) 22.104 - preparing the way for more detailed work in 3GPP Release 16. CyberCAV efforts in SA1 are focusing on cyber-physical control applications in various vertical domains, especially in industrial automation and energy automation. 5G ultra-reliable ultra-low-latency communication (URLLC) is needed for sharing real-time information, for example, between machines at various steps in a production cycle. TS 22.104 also contains the service requirements, such as on clock synchronization for time-sensitive networking, for cyberCAV using LAN-type services. Broader cyberCAV requirements are included in TS 22.261 – “Service requirements for next generation new

services and markets”. This specification contains the 5G requirements for security, non-public 5G networks, network capability exposure, QoS monitoring, and Ethernet transport. Section 6.28 of TS 22.261 provides a useful description of the cyberCAV area: A vertical domain is a particular industry or group of enterprises in which similar products or services are developed, produced, and provided. Automation refers to the control of processes, devices, or systems in vertical domains by automatic means with sensors, transmitters, controllers, and actuators. Cyber-physical control applications are to be understood as applications that control physical processes. In automation, they follow certain activity patterns (open-loop control, closed-loop control, sequence control, and batch control). Communication services supporting cyber-physical control applications need

to be ultra-reliable, dependable with a high communication service availability, and often require low or (in some cases) very low end-to-end latency. The 5G specifications on cyberCAV are set to be an important enabler for 5G communication in industrial and energy automation and other vertical domains. The Stage 1 work on cyberCAV in TS 22.104 is based on technical reports TR 22.804 (Study on Communication for Automation in Vertical Domains) and TR 22.821 (Feasibility Study on LAN Support in 5G). Both technical reports contain background information on the cyberCAV requirements, including an extensive collection of relevant use cases. Stage 2/3 work on cyberCAV functionality has now started. It will define corresponding extensions of the 5G architecture, 5G features and functionalities.

Ericsson CTO Calls for Rational 5G Regulation

Ericsson joined calls for a rational approach to spectrum license fees for the 5G era, urging regulators not to sacrifice the long-term potential of the technology for short-term gain. Erik Ekudden, the vendor's CTO (pictured), told Mobile World Live governments must prepare an investment climate that enables all parties to profit from the next-generation technology. Key to this are light touch regulations which deliver the necessary spectrum, and give companies the confidence to invest in and deploy 5G kit. “There is no meaning in having high up-front fees for spectrum when the real value of 5G infrastructure comes down the road in terms of benefitting all of society”, he explained. In addition to a change in approach to licensing, Ekudden noted 5G is also changing the way Ericsson develops technology: “It's less about competition”, with the vendor increasingly focused on

how it can work with operator customers “with our partners in the ecosystem” to develop new ways of working. “It's really more of a market, a customer and outside-

in perspective.” Ekudden also discussed the need for beefier security in 5G and Ericsson's membership of the ORAN Alliance.



Democrats Tackle Net Neutrality with 'Save the Internet Act'

Senate and House Democrats put forth a two-page bill that proposes to reinstate the net neutrality rules that were repealed two years ago. The "Save the Internet Act" seeks to enact the three pillars of net neutrality—no blocking, no throttling and no paid prioritization by large internet service providers (ISPs). It also seeks to empower the Federal Communications Commission to "prohibit unjust, unreasonable and discriminatory practices," according to a press release. Net neutrality, a.k.a. the Open Internet Order, was put in place in 2015 by the FCC as a means to require ISPs to treat all internet traffic equally across their networks. It also reinstated broadband providers under a Title II classification, which allowed them to prioritize some types of internet traffic and set pricing. FCC Chairman Ajit Pai, who was appointed by the Trump administration, spearheaded the effort in December 2017 to repeal the net neutrality rules, which the FCC commissioners approved by a 3-2 vote. Those votes were along party lines. Consumer groups and large companies, such as Facebook and Amazon, have opposed the overturning of net neutrality. Several states, including California, have been developing their own rules for large ISPs. Attorney generals in 22 states and several tech firms have filed a suit in the U.S. Court of Appeals for the District of Columbia. The FCC commissioners that voted in favor of removing net neutrality characterized the rules as heavy handed while also leading to fewer investments. The Save the Internet Act bill is headed for markup, but House Speaker Nancy Pelosi, D-Calif., said in a press conference

Wednesday morning that the bill would come to the floor in the coming weeks. Sen. Chuck Schumer, D-N.Y., said he expected the bill to have bipartisan support in both the Senate and the House, and that it would pass in both, according to a story by CNBC. Assuming it passes the Democrat-led House and Republican-controlled Senate, the bill would need to be signed by President Trump in order to change the FCC ruling. Since the initial repeal was done during Trump's administration, an approval of the new bill during the same administration doesn't seem likely. "The free and open Internet is a pillar of our democracy," said Pelosi in a prepared statement. "It is an honor to join Democrats from both sides of the Capitol to introduce this strong legislation, which honors the will of the millions of Americans speaking out to demand an end to the Trump

assault on net neutrality. Democrats are proudly taking bold action to restore net neutrality protections: lowering costs and increasing choice for consumers, giving entrepreneurs a level playing field on which to compete, helping bring broadband to every corner of the country, and ensuring that American innovation and entrepreneurialism can continue to be the envy of the world." In early January, before adjourning for new members and an ensuing Democrat majority, the GOP-led U.S. House of Representatives voted against reinstating the net neutrality rules that were put in place in 2015 under the auspices of then-FCC Chairman Tom Wheeler. The Congressional Review Act, which would have nullified the new FCC rules that got rid of net neutrality, passed the Senate in May with support from three Republicans.



PTA Is Enriching Mobile Ecosystem and Curbing Counterfeit Mobile Devices

In order to facilitate the general public and, as per Telecommunications Act 1996 & Regulation, Pakistan Telecommunication Authority's (PTA) mandate is to ensure that mobile devices being imported conform to technical standards laid down by international standardization bodies and do not pose any health or frequency issues in licensed spectrum being used in Pakistan. Moreover, contrary to certain

media reports, PTA has not imposed any restriction on the import of mobile devices (new or used). In light of Federal Cabinet decision, PTA complied with the directives and Type Approval Regulations, DIRBS regulations & SOP were amended. Accordingly, all entities planning to import a type approved model (new or used) can do so from the ease of their location by submitting documents via PTA

online mobile device registration system (<https://www.dirbs.pta.gov.pk/drs>). This is done to create ease of doing business for all and enabling them to apply via an automated system. It is also clarified, that Groupe Speciale Mobile (GSMA) is not an approving authority on mobile phone bodies. It is an international organization to which manufacture applies for issuance of Type Allocation Code (TAC).

mmWave Coalition Urges Inclusion of Licensed Spectrum in 95 GHz Rules

The mmWave Coalition (mmWC) appreciates the FCC's relatively quick action on queuing up spectrum bands above 95 GHz, but it's advocating that several issues be addressed in the proceeding, including licensed spectrum for fixed and mobile use, before the FCC gets too far ahead of itself. At its meeting next week, the commission will consider a First Report and Order that would adopt rules to make 21.2 GHz of spectrum above 95 GHz available for unlicensed operations. It would also create a new class of experimental licenses for the 95 GHz to 3 THz spectrum range. But while the order recognizes that spectrum bands above 95 GHz are "potentially suitable for licensed use," it doesn't adequately address the need for licensed spectrum, according to the coalition, whose members include Nokia, NYU Wireless, Keysight Technologies and others. "While we welcome the availability of unlicensed spectrum in the Draft R&O, we request that the Commission also address the

need for licensed spectrum which were included in the NPRM and addressed in our comments as well as in the comments of others," the mmWC told the commission (PDF). "In today's spectrum environments, licensed and unlicensed spectrum and new allocations for them exist side by side and are complementary." The immediate need for licensed spectrum is for point-to-point applications for cellular backhaul and fixed communications systems and do not need area licensing as mobile applications do, the coalition said, adding: "However, we also foresee the eventual use of these spectrum bands for mobile use under appropriate service rules for responsible sharing with fixed users." In its draft First Report and Order, the FCC noted that the record in this particular proceeding is marked by an enthusiasm for the possibilities that the spectrum above 95 GHz holds for short-range applications but also includes "expressions of caution to ensure that we do not diminish the important scientific research that takes

place in these frequencies. "Taking this record into account, this First Report and Order focuses exclusively on uses that, by their nature, are only permitted to operate on a non-interference basis within the band: experimental operations and unlicensed use," the draft R&O said. "By providing new experimental licensing opportunities and making spectrum available for unlicensed use, we are taking the appropriate first steps towards developing the bands above 95 GHz. We expect to gain knowledge from real world operation that will inform the Commission's future consideration of more expansive use, including nonexperimental licensed uses, in these spectrum bands." The mmWave Coalition is also advocating for RF safety rules above 100 GHz and for at least one large contiguous block of spectrum of 20 GHz or more, especially for Fixed Service links, to supplement the large use of fiber-optics technology for both mobile backhaul and fixed communications systems.

British Regulator Ofcom Criticized From All Sides Concerning Coverage

MPs demand Ofcom polices coverage obligations better, Vodafone says Ofcom is hindering its ability to provide greater coverage affordably and the playing field is uneven. More than 40 Members of the UK Parliament from the All-Party Parliamentary Group on Rural Business (APGRB) demanded that the regulator, Ofcom, should better monitor the main four British mobile operators. The Group says EE, O2, Three UK and Vodafone need to be checked up on more thoroughly, annually, to ensure they are meeting their coverage obligations for 4G and, in future, 5G. The previous week Vodafone executives expressed strong views about the impact on regulation on coverage too at a UK press briefing, but for very different reasons. The operator's General Counsel, Helen Lamprell, outlined a number of ways that Vodafone sees as impediments to it meeting its coverage obligations affordably and on an even playing field. She also expressed concern that the UK

regulator was already "one of the most conservative in Europe" and that it could become more so after Brexit, once freed of the influence of Body of European Regulators for Electronic Communications (BEREC – although some would argue that it gives Ofcom a chance to set better priorities). Petty said that while 99% of the population and 85% of the land mass has mobile network coverage, expanding that geographic coverage by the next 10% would be difficult, as it is primarily in areas like the Welsh mountains and northern Scottish Highlands "Where there are no people" according to Lamprell, who also pointed out:

- Fixed broadband providers receive subsidies and are leverage various funding models, mobile broadband providers were expected to bear the full cost of providing mobile broadband, even where it was not economically feasible to do so
- The regulator has concentrated on

improving access to ducts and poles, which is welcome, there is a vast reserve of dark fiber in the UK which Openreach does not have to make available to BT's competitors.

- Mobile operators are limited to a stand-alone mast height of 25 meters, half the height most of their European counterparts are allowed to deploy. Vodafone UK's CTO, Scott Petty explained that every 10 meters of additional height beyond 25 meters doubles the size of the coverage area. The issue is 50% of the UK's land is owned by 0.6% of the population which has lobbied successfully against taller masts. As Lamprell said, "Everyone wants coverage, no-one wants masts".
- It's possible that the government could opt for "rural roaming", which was an option laid out in Ofcom's Advice to Advice to Government: Further options for improving mobile coverage, last September. This is supported by

APPGRB. Both Lamprell and Petty said this would not work because none of the operators would build infrastructure where there are few or no people if they will be forced to share their hefty investment its competitors which would not even cover costs.

- Vodafone would prefer operators being allowed to share infrastructure, including the costs, which makes better economic sense. Lamprell said regulation should allow exceptions to its policy for areas where it is impossible to recoup the cost of building out infrastructure. EE, O2, Three UK and Vodafone met the Department of Digital, Culture, Media and Sport (DCMS) last Thursday, with many of these issues on the agenda.
- Vodafone would like to continue to

the roam-like-home in Europe for UK customers after Brexit, but that once the UK is out of the EU, it will be bound by termination rates set by different countries' regulators where it does not have an opco to hand-off calls to. She gave the example of Estonia which has higher termination rates and it looks like Vodafone would have to pass those charges onto customers.

- Ofcom seem to have had a sudden change of strategy for the next phase of the 5G spectrum auction later this year, in which it will sell 120Mhz block in the 3.6-3.8GHz frequencies, plus 80MHz in the 700MHz. The ranges are suited to different purposes (wide coverage and high speed respectively), and Petty said, "We could end up with a very fragmented

spectrum situation".

- The executives also said Vodafone UK would probably have taken different decisions in the first phase of the auction which took place in April 2018 had they had any inkling of Ofcom's proposed actions in the second.
- Vodafone's view is that it's not just the operators that will suffer if these issues aren't addressed. The UK is in a relatively strong position with 5G – in contrast to its laggard approach to 4G rollout – but poor regulatory and political decisions could severely hamper not just the speed of 5G's deployment, but make the country less attractive to talent, businesses and investors.

EU Backtracks on Digital Tax

The European Union (EU) was expected to abandon efforts to create a digital tax for the bloc, instead focusing on a global tax system for tech companies, Reuters reported. Its original plan would have required large companies in the EU to pay a 3 per cent levy on revenue generated from the sale of user data, online marketplaces and targeted advertising. However, it was blocked by the Republic of Ireland and Scandinavian countries, which feared a loss of revenue and political backlash. A number of delegations continue to have fundamental objections," the Romanian presidency of the EU wrote in a document prepared ahead of a meeting of EU finance ministers meeting on 12 March, which was seen by Reuters. Countries including France, Italy and Spain, which were in favor of the tax, have introduced it on a national level. The EU's decision is likely to be welcomed by tech giants including Google and Facebook, Reuters stated. Meanwhile EU Ministers are expected to agree to keep working on a global tax reform prepared by the Organization for Economic Cooperation and Development. Earlier the Council of the European Union

primed rules to scrutinize direct investments, including takeover proposals from countries outside the region on the grounds of security or public order. 🇪🇺



A SNAPSHOT OF REGULATORY ACTIVITIES IN SAMENA REGION



Afghanistan

The Afghanistan Telecommunications Regulatory Authority (ATRA), a government agency supervising telecommunication services, has ordered the private telecommunication companies to correct their activities and provide high-quality call and internet services to the people, otherwise, it says would penalize them. Officials at the authority said that in a meeting held with the representatives from telecommunication companies on Saturday, they promised to work for improvement of their call and internet services in the New Afghan Year. "The telecommunication companies promised to increase investment on their networks and frequencies in the year of 1389 to improve services. We also seriously probe the quality of internet services according to the license conditions. We will share fines imposed on the violator companies," said Mohammad Najib Azizi, Head of the Authority. The users of social networks have recently launched a campaign to protest low quality of internet services. They consider the ATRA guilty. The ATRA says that communication companies accepted not to charge customer service calls, while they used to do in the past. Wahidollah, a Kabul resident complained for high fees and low internet quality. Sardar, another resident of the capital says that calling to police's urgent number and the firefighting department was free previously, but now the companies charge

for each. The companies of Afghan Wireless, Roshan, MTN, Etisalat, Salaam and Afghan Telecom are providing phone and internet services in the country. (March 31, 2019) afghanistantimes.af

A coordination meeting was organized between ATRA, Ministries and Organizations whose ICT projects funded by TDF. At the outset of the meeting, Dr. Mohammad Najeeb Azizi, ATRA Board Chairman, appreciated their participation in the meeting. He then gave comprehensive and academic information on role of the ICT projects implementation in today's human beings' society, in particular, higher education, education, public health, affairs expedition and transparency in fulfillments. Considering importance of the projects, Mr. Azizi requested the participants to take efficient actions in regard to successful implementation of ICT projects without any delay, adopting required measurements and said that, "Every organization is required to do their best efforts so as to implement the projects on time". The participants presented their work progress reports and existing problems on the projects and later necessary guidelines were issued after hearing the problems. It is noteworthy that ATRA is to sign several ICT projects, funded by TDF, with 24 Ministries and Organizations of the state. (March 26, 2019) atra.gov.af



Algeria

The ICT Minister, Imane Houda Feraoun, has inaugurated the landing station of the Medex cable branch linking the country's optical fiber network to international data markets, reports Capacity Media. Medex was one of two projects commissioned in 2018 to strengthen Algeria's connectivity capabilities. The second cable system, named Orval, is already under way and expected to go live later this year, connecting Algiers and Oran to the Spanish city of Valencia. The Medex and Orval systems

will have an overall capacity of up to 8 Tbps. Built by Alcatel-Lucent, the 184 km Medex cable branch is a joint project between PCCW Global and Algeria Telecom, and has required an estimated investment of USD 32 million. It lands in the Algerian seaport city of Annaba and joins with international cable systems (TE North/TGN-Eurasia/Seacom/Alexandros) connecting the United States to Asia, via Mediterranean landing stations in Egypt (Abu Talat), France (Marseille) and Cyprus (Pentaskhinos). (March 2, 2019) telecompaper.com



Bahrain

Bahrain set out its stall in a bid to be one of the first countries globally to provide commercial 5G services, with operators in the

process of deploying the necessary infrastructure for a rollout in June. In a statement released by the country's Ministry of

Transportation and Telecommunication, Bahrain announced itself as a contender to set the 5G pace, while outlining aims to emerge as the Gulf's leading technology test-bed. The ministry said all policy hurdles for 5G implementation had been resolved, while licensing and spectrum allocation is set to be finalized by mid-April. Operators completed all the necessary 5G trials in June 2018, the ministry added. With all the pieces in place, it said a June rollout would be achieved, pending availability of consumer handsets and equipment. Notably, while the US and Asia gather the majority of the headlines for being 5G pacesetters, it was in the Middle East, and specifically the UAE, where operators claimed to have launched 5G first, through fixed wireless access in May 2018. The ministry pointed out that Bahrain ranked first in the region in the ITU's ICT development index for the last five years, and fourth globally in the UN's telecoms infrastructure index in 2018. In its statement, the ministry also had a dig at the UK, highlighting how far advanced it was in being ready to pull the trigger on the technology compared to the European powerhouse. Minister of Transportation and Telecommunications, Kamal bin Ahmed Mohammed said its leadership in 5G reflects Bahrain's appetite for innovation "and sends a signal to the world that we can be a test-bed for some of the most transformative technologies". "There were a lot of hurdles along the way: ensuring spectrum availability as soon as possible was a big challenge, but overcoming these obstacles exemplifies the support and cooperation amongst all stakeholders." In an interview with Reuters, Mohammed also confirmed the country's operators would not be blocked from using equipment made by Huawei in 5G networks, despite US warnings around the company regarding security. Viva Bahrain, which is owned by STC, signed a deal with Huawei last month to deploy 5G products in its network. (March 27, 2019) [mobileworldlive.com](#)

Bahrain's Telecommunications Regulatory Authority (TRA) published its second consultation on the award of mobile spectrum in the 800MHz and 2600MHz bands, inviting comments by 21 April. The license application window is set for 30 May-6 June, with a date of 13 June 2019 scheduled for announcing the results of the tender. The spectrum on offer is 60MHz (2x30MHz) in the 800MHz FDD band (791MHz-821MHz/832MHz-862MHz) and 140MHz in the 2600MHz TDD band (2550MHz-2690MHz). The TRA will award three 'Basic Spectrum Portfolios', each comprising 2x10MHz in the 800MHz band and 40MHz of 2600MHz TDD spectrum, at a price of BHD4.39 million (USD11.57 million) each. The remaining 20MHz in the 2600MHz band will be auctioned via sealed bids from Basic Spectrum Portfolio winners, offered as two 10MHz blocks with reserve prices of BHD166,000. The only participants expected in the tender are Bahrain's three mobile incumbents Batelco, Zain and Viva, which all currently offer 4G LTE mobile services using the 1800MHz band.

(March 22, 2019) [telegeography.com](#)

The Telecommunications Regulatory Authority's (TRA) Board of Directors held their first meeting this year, at TRA's headquarters. During the meeting, Board members discussed key issues related to the telecommunications sector; in particular those that are of interest to the general public. This includes the progress of the projects related to the Fourth National Telecommunications Plan (NTP4) and the progress of achieving the NTP4's objective

of establishing the National Broadband Network ("NBN"), which is supported through a single fixed fiber network. These projects are considered important to address consumers' concerns and promote their welfare, which is a step towards achieving the vision and policy of Bahrain's leadership. The Board also discussed updates on the Batelco Separation project and the latest project milestones and deliverables to which they expressed their appreciation to TRA for its outstanding efforts in following up on the latest development of the Batelco separation process and its efforts in delivering the project in an efficient manner. The Board also praised the TRA for its 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. In addition, the Board discussed the issue related to regulating and rectifying the telecoms towers situation in Bahrain which is of a high importance in the telecommunications sector. They hailed the endeavors and the actions taken by TRA to rectify the telecoms towers situation and find the appropriate solutions in coordination with the concerned government bodies, in particular the development of a rectification plan which focuses on important aspects as a priority among other things. Moreover, the Board discussed the latest market indicators in Bahrain which highlight the continued growth of the sector and the rapid increase in using the most advanced telecommunications technologies and services. The Board commended TRA on its leading role in the progress and development of the sector. The Board expressed their thanks and appreciation to the TRA management and team members for their support and professionalism and outstanding role in developing the sector. (March 19, 2019) [tra.org.bh](#)

The Telecommunications Regulatory Authority (TRA) introduced a unified free number (88444) to reduce spam messages in cooperation with the mobile network operators, by either blocking the messages through sending the word "Block" followed by a space and then the "Sender ID" or resuming the messages by sending "Unblock" followed by a space and then the "Sender ID". "TRA recognizes the importance of addressing this issue with the increasing and evolving communication and advertising technologies for e-marketing. This number is an additional step in unifying efforts to protect the privacy of individuals from spam messages" said TRA Acting General Director Sh. Nasser Bin Mohamed Al Khalifa. TRA urges all organizations using the bulk messaging service to ensure that their contracted service provider complies with the Bulk Messaging Regulation issued by Resolution No. (3) of 2015. One of the obligations includes that consumers, who have expressly consented, can receive solicited bulk messages in the appropriate time between the hours of 09:00am and 08:00pm according to the Kingdom of Bahrain's timing. TRA also notes that there is a technical feature in the settings of some smart phones to block spam messages, which enables consumers to stop notifications of messages from the sender in their phones and archive them immediately. Consumers can contact their service provider or refer to the help manual to adjust their phone settings in this regard. TRA urges all consumers to beware from providing their direct numbers for marketing and

to read through the terms and conditions set by all the places that require to provide them with their direct numbers. TRA strongly advises consumers to communicate with the sender to opt them out or block them through using the unified number 88444 and follow the steps herein. (March 4, 2019) tra.org.bh

In its effort to enable subscribers who have not registered their prepaid SIM-cards, the Telecommunications Regulatory Authority (TRA) in the Kingdom of Bahrain hereby extends the prepaid

SIM-cards registration renewal deadline by (3) months, the new deadline is the 2nd of June 2019. TRA further clarifies that failing to register within the specified period will result in suspension of the service on a temporary basis, failing to register again during the suspension period will result in final deactivation. This initiative is part of the Authority's on-going efforts to protect and safeguard subscribers from fraud and identity theft. TRA advises subscribers to visit their service providers and present verification documents to complete registration and avoid deactivation.

(March 2, 2019) tra.org.bh



Bangladesh

The number of mobile subscribers increased by 8.94 lakh in February as all four mobile operators managed to add customers. As per the Bangladesh Telecommunication Regulatory Commission data, the number of total mobile phone subscribers increased to 15.84 crore at the end of February from 15.75 crore in January this year. Leading mobile phone operator Grameenphone attained highest 4.02 lakh subscribers, taking its subscriber-base to 7.35 crore from 7.31 crore. Third largest operator Banglalink's subscriber-base increased by 3.32 lakh to 3.4 crore at the end of February from 3.37 crore. The second largest operator Robi managed to add 1.25 lakh subscribers, taking its total number of subscribers to 4.70 crore from 4.69 crore. The lone state-owned entity Teletalk's number of subscribers increased by 36,000 in February to 39.21 lakh from 38.85 lakh a month ago. Apart from the mobile phone subscribers, the number of active internet users in the country increased by 6.4 lakh in February to 9.21 crore from 9.14 crore a month ago. Internet subscribers of mobile phone operators, which provides internet to 93.7 per cent subscribers' in the country, rose by 6.38 lakh to 8.63 crore from 8.56 crore. Growth of broadband internet subscribers has been remaining almost halted for almost once year. In February, broadband internet service providers and PSTN operators managed to add only 1,000 subscribers. Subscriber base of the entities stood at 57.31 lakh from 57.3 lakh after losing 5,000 subscribers in January this year. From October to December 2018, broadband internet subscribers failed to add any customers under their service. During the entire 2018, broadband service providers and PSTN operator could bring in only 3.91 lakh customers under their service after the addition of 15.23 lakh in the year 2017. As per the latest available data, 1,478 entities are operating ISP business across the country as of Sunday while the figure was 499 in 2017. Internet service providers, however, differed with the BTRC statistics adding that it might be the new definition of broadband where connections with 5 megabits per second or above speed was named as broadband internet. As a large number of the subscribers use less than 5Mbps connections, they might have been excluded from BTRC's calculation, they said. (March 25, 2019) newagebd.net

The Bangladesh Telecommunication Regulatory Commission (BTRC) has withdrawn the four conditions it imposed on leading

mobile operator GrameenPhone (GP) in February 2019 after the cellco challenged their legality at the High Court, The Daily Star writes. Following the adoption of the Significant Market Power Regulations in November 2018, GP was declared as holding Significant Market Power (SMP) in two categories (subscribers and revenue), with the operator accounting for 46.33% of the country's active customer base in 2018, while its revenue share has been more than 50% for several years. In February 2019 the operator was asked to implement four restrictions, which include a ban on signing any exclusive deals with goods and service providers and a ban on nationwide ad campaigns marketing its dominance. GP was also required to reduce its call drop rate to less than 2%, while subscribers wishing to switch their mobile provider will be required to stay with GP for only 30 days (90 days for other operators). The regulator has now drafted a list of 20 new SMP restrictions, with GP given 15 days to comment on the document. The proposed areas of regulations are: asymmetric mobile termination rates (MTRs), cross subsidy, mobile number portability (MNP) lock-in period, spectrum pricing, infrastructure sharing, exclusivity, loyalty campaign, product and service approval process/automatic approval of retail tariffs of non-SMP operators, social obligation fund, voice tariff, data floor price, parallel pricing or ante approval of retail tariffs, green technology or renewable energy, merger and acquisition threshold, corporate social responsibility, number of products, quality of service (QoS), revenue sharing and market communication.

(March 21, 2019) telegeography.com

The Bangladesh Telecommunication Regulatory Commission (BTRC) has allowed Internet Protocol Telephony Service Providers (IPTSPs) to launch mobile phone application-based calling services, subject to seeking the commission's permission to do so. Of the 33 licensed IPTSPs currently operating in the country, the BTRC has so far allowed six to offer mobile phone-based applications, namely: Inter Cloud, BDCOM Online Limited, Amber IT Limited, MetroNet Bangladesh, Link3 Technology Limited and ICC Communication. Of these, Inter Cloud has already launched its app-based calling service, which it has dubbed 'Brilliant Connect'.

(March 4, 2019) telegeography.com



Egypt

The Minister of Communications and Information Technology Amr Talaat and the Secretary-General of the International Telecommunication Union (ITU) Houlin Zhao have signed an agreement to host the World Radiocommunication Conference (WRC-19) and the Radiocommunication Assembly (RA-19) under the auspices of the President of the Republic, from October 21 to November 26, in Sharm El-Sheikh. Around 3500 experts and government officials, representing 160 countries worldwide, and over 80 ICT international companies and organizations are to participate. The ITU Radiocommunication Sector (ITU-R) WRC is one of the most important international forums organized by the ITU, where most heads of regulatory bodies worldwide and key players in spectrum management participate. It serves as the compass of telecommunications development, in particular wireless communications, mobile phone industry, digital broadcasting systems and satellite industry. During the conference, a spectrum is to be allocated for 5G mobile technology, sparking the spread of 5G services around the world, along with the development of Internet of Things (IoT) technology, cloud computing, and Artificial Intelligence (AI). 5G shall spur the spread and development of these technologies to work together leading all countries of the world towards digital transformation. In addition, Member States shall endorse the international agreement on wireless communications around the world, which is the radio regulations that set the regulation rules of any modern wireless communication technology around the world. Talaat stated that hosting this major international event in Egypt - held for the first time in 20 years outside ITU headquarters in Geneva - proves how confident the international organizations are in Egypt's capability of organizing important international events. This is a pivotal turning point in the policies and systems that the world seeks to develop their mechanisms to cope with the changes in different sectors worldwide. The ICT minister added that hosting the conference in Egypt will reinforce the Egyptian ICT sector at both the regional and international levels, especially as spectrum issues have important political and economic dimensions. Moreover, the host country will chair the conference activities, which further emphasizes Egypt's leading role, especially that the conference delves into important issues related to digital broadcasting systems, wireless communication system, satellite industry, scientific definition of 5G technology and bandwidth, and ends with adopting an international agreement named Sharm El Sheikh 2019. Furthermore, Talaat said that the conference will be held under the auspices of the President of the Republic, with more than 3000 participants from around the world. He highlighted Egypt's keenness to have a conference that reflects Egypt's prestige and meets the ITU member states' expectations, as all necessary measures, and organizational, service and security preparations are being taken. On his part, Zhao hailed the Egyptian government's efforts in preparing to host WRC in Sharm El Sheikh, and highlighted that holding the conference in Egypt comes out of the ITU confidence in Egypt's capability to offer the needed support for the conference's success. He emphasized the

importance of the issues discussed during the conference, not only to the international communication community, but also to the entire world. This includes 5G technology spectrum, which is of great importance in the development of modern technologies on which services depend. ITU's Radiocommunication Bureau Director Mario Maniewicz stated that WRC will adopt the international agreement for regulating the radio frequency spectrum, which will manage the communication between institutions, people and smart devices, thus furthering the development of digital services in various fields of industry, economy and service activities. The agreement signing was witnessed by the Acting Executive President of the National Telecom Regulatory Authority (NTRA) Mustafa Abdel-Wahed and a number of officials from the Ministry of Communications and Information Technology (MCIT). Furthermore, Egypt's hosting of this event completes NTRA role in following up to the study groups meetings and their teamworks, which had the greatest impact in supporting the Egyptian administration to form its views on WRC 2015 agenda items. In addition, the Egyptian administration, represented by NTRA's Frequency Spectrum Sector, holds many administrative positions in ITU Radiocommunication Sector. The World Radiocommunication Conference (WRC) is held every three to four years, for maximum four weeks, preceded by the Radiocommunication Assembly (RA) for one week, and followed by the first Conference Preparatory Meeting (CPM) of the next WRC, for three to five days, to arrange for its preparatory studies.

(March 25, 2019) tra.gov.eg

The Ministry of Communication signed 32 memorandum of understanding (MoU) to launch digital transformation, establish data centers, develop networks, hold technological training for Egyptian youth and attract investments," Minister of Communication Amr Talaat told. "Also, the ministry signed MoUs with Huawei, Nokia and Ericsson," he added. These agreements were signed during the minister's participation in the World Mobile Exhibition that was held in Barcelona from February 25 to 28 under the title of "Intelligent Connectivity". During the exhibition, the minister met with more than 41 high level officials from international companies and institutions in the field of communications, technology and information, including three ministers from other countries, he said. Contracting with Microsoft will boost investments in Egypt and increase the confidence of international companies in the same field in the country's investment climate. During the current parliamentary session, the ministry will present the Personal Data Protection law that aims to protect data of companies and international institutions provided they have the same law. "Moreover, extensive talks were held with World Bank officials and the organizer of the World Expo, where I met with the World Bank vice president for infrastructure affairs to help Egypt become an information technology center in the region and establish projects to support African countries especially that Egypt is in charge of the African Union," the minister said. The year 2018 was a significant year

for Egypt's Information and Communications Technology (ICT) sector, where it was awarded membership in the Administrative Council of the International Telecommunication Union. Also, the contribution of ICT to the gross domestic product (GDP) grew 14 percent year-on-year in FY2017-18 compared with FY2016-17. In line with Egypt's vision to attract foreign investment and

rebuild the Egyptian citizen, Egyptian Minister of Communications and Information Technology Amr Talaat announced his ministry's strategy during the three years and stating the current figures of ICT sector at American Chamber monthly luncheon meeting.

(March 4, 2019) [egypttoday.com](#)



The Ministry of ICT (MICT) says that broadband internet access will be available to almost all rural areas of the country by the end of the next Iranian calendar year (March 2020). The 63% of rural areas currently have access to fixed or mobile telephony and broadband services, up from 32% in September 2017. Mehrdad Torabian, Director of ICT at the Rural Development office of the

MICT, is quoted as saying: 'In 2017 close to 9% of villages were totally deprived of any sort of communication services. The figure is now down to 3%.' The Iranian government controls the country's main fixed and cellular operators, Telecommunication Company of Iran (TCI) and Mobile Communication Company of Iran (MCI). (March 1, 2019) [The Financial Tribune](#)

Iran



The Information and Communications Commission completed its procedures for the launch of the fourth mobile license. This came during a discussion workshop held in Baghdad under the patronage of the Prime Minister in implementation of the Council of Ministers' Resolution No. 216 of 2018. The workshop was held in the presence of the Ministerial Committee, the Ministry of Finance, the Financial Control Bureau, the House of Counselors and the Parliamentary Committees, the Prime Minister's Office and representatives of the Ministries and the Inspector General, banks, banks and private sector companies, as well as a high level diplomatic presence. Before the global consulting firm overseeing the auction process. Chairman of the executive body of the media and communications d. Ali Nasser Al-Khuwailidi stressed that the Commission has worked through the Higher Ministerial Committee headed by the Prime Minister and its membership of the Ministry of Finance and the Ministry of Communications to extend the work of the global consulting company to complete the mechanisms of granting the fourth license, noting that more than 60% , Stressing that the presence of members of the diplomatic corps is an important factor to support this important action through their countries and at all levels. He stressed the importance of the auction of granting the fourth license inside

Iraq to broadcast a reliable message to the world about the stability of the country on the security and economic levels, revealing the submission of more than 40 international and Arab companies to compete over this license has been allocated frequencies necessary for that matter. Representatives of the parliamentary committees stressed during their interventions on the importance of giving powers to companies to complete the infrastructure, and the involvement of the cash bloc in the country within the company, which will be granted the fourth license to the importance of the matter on two levels; the first to encourage the work of companies in general, and move the domestic economy on the other. PWC representative Ismail Murqa said that the company believes that the company that will receive the fourth license will use new and modern technologies and will be able to access the technological progress that the world has reached today, adding that the company is looking at evaluating the market and reaching the stages that will improve the services in Iraq. The workshop also witnessed discussions and discussions with representatives of specialized companies, banks and international organizations on the mechanism of announcing and granting the fourth license.

(March 18, 2019) [cmc.iq](#)

Iraq



Chief of the Telecommunications Regulatory Authority Board Dr. Eng. Ghazi Jabour met on the sidelines of the general meeting of the Group of Euro-Mediterranean Regulators EMERG held in the Bosnian capital Sarajevo Director General of the

Communications Commission of the Republic of Bosnia and Herzegovina, where they discussed ways of joint cooperation between the two sides between Jabour development reached Jordan to him in the telecommunications sector and the BPH

Jordan

body create the regulatory environment and employ all modern means to serve the telecommunications and postal sector, and this Bosnian side expressed admiration for what you are doing the telecommunications Authority in Jordan, it was agreed that the delegation N Communications Commission in Bosnia and Herzegovina visited close to the Telecommunications Regulatory Authority (TRA) to see what got him the body of the development and benefit from the Jordanian expertise in this field. Dr. Jabour welcomed the joint cooperation and coordination through the events of convergence and harmony in regulatory frameworks in place in the Mediterranean countries to achieve communication technology environment and good information that will encourage investment and achieve well-being of the peoples of the region.

(March 31, 2019) trc.gov.jo

The Chairman of the Board of Commissioners of the Telecommunications Regulatory Authority (TRA), Dr. Eng. Ghazi Al-Jabour, participated in the Euro-Mediterranean Meeting of EMERG organizers held in the Bosnian capital of Sarajevo with the high participation of the executive heads of the member countries of the Group. Dr. Jabour pointed out that the general meeting recognized the presence of the executive heads of the regulatory bodies in the member countries of the group to approve the outputs of the meeting of the focal points and the work plan of the group for the year 2019 in addition to discussing many topics related to the activity and role of the group and its continuation in holding specialized workshops related to discussing the latest international practices Within the scope of the best regulatory provisions. During his meetings with the executive heads of the participating bodies, Dr. Jabour stressed the keenness of the body representing the Kingdom in the group to continue to cooperate and coordinate with the countries of the group by participating in activities through which the group aims to bring about convergence and harmony in regulatory frameworks in the countries of the Mediterranean Healthy communication and information technology that will promote investment and prosperity for the peoples of the region. He added that according to the work plan adopted during the meeting, the TRA will host a workshop on wholesale services during the month of June, with the participation of all members of the group. The Euro-Mediterranean Group of Regulators EMERG was established in 2008 as an independent international organization representing the organizers of communications in the Mediterranean countries. It seeks to achieve cooperation and coordination through achieving harmony and convergence in the organizational frameworks among the member countries based on the principles of cooperation between the Mediterranean countries in the Barcelona Declaration, The Mediterranean will consolidate the values of cooperation, peace, stability and the well-being of the peoples of the Mediterranean region through dialogue and cooperation in economic, social and political matters. Membership is open to the regulatory bodies

concerned with the regulation of telecommunications, whether they are European countries within the umbrella of the European Telecommunications Regulatory Organization (BEREC), as well as the South and North Mediterranean countries. (March 26, 2019) trc.gov.jo

The two specialized workshops hosted by the Telecommunications Regulatory Authority (TRA) on "The Impact of Exposure to Electromagnetic Fields on Public Health and Safety" and "Internet of Things" were launched in Amman today in cooperation with GSMA and with the broad participation of mobile operators, Civil society organizations and other concerned local authorities, as well as representatives of the Arab member administrations of the Arab Regulators Network. The two workshops are organized for two days in light of the role of the Authority in protecting the rights and interests of the beneficiaries of the telecommunications and information technology services in order to maintain public health and safety, as well as its role in increasing Jordanian citizens' awareness of the rapid technological developments affecting the various aspects of our human lives. The Chairman of the Board of Commissioners Dr. Ghazi Jabour said in his speech at the opening ceremony of the workshop: "The subject of" the impact of exposure to electromagnetic fields on public health and safety "has been the focus of attention of many of the people of this country, which led us to loan more attention and study Bbdih Legal and humanitarian aspects. Jabour added that the Authority has been accustomed to keeping abreast of the developments in the ICT sector, so it has paid particular attention to the internet of things in support of the national digital transformation and its role in spreading the spread of smart cities systems. Javad Jalal Abbasi, President of the Middle East and North Africa region at GSMA, said: "We are delighted to continue fruitful cooperation with the Jordan Telecommunications Regulatory Authority (TRA). Through the GSMA Capacity Building Program, which consists of a series of training courses for regulators , the Association will share experiences and policies from around the world to maximize interest and to articulate effective and best global policies to ensure continued investment in cellular networks that have become the solid foundation of the digital economy and the knowledge society. The agenda of the workshop on the impact of exposure to electromagnetic fields includes many important topics, notably: electromagnetic waves in terms of source and scientific research in the study of the effects of exposure, the permitted values of human exposure, in addition to the allocation of a session to raise public awareness of the role of the body and practices of In its role in reducing the effects of exposure to electromagnetic fields on public health and safety as the authority responsible for licensing and monitoring the use of radio frequency spectrum. The agenda for the Internet Workshop also includes many important technical and organizational topics, including its organizational, economic and technical aspects.

(March 4, 2019) trc.gov.jo



Kuwait

Kuwait is exerting great efforts in the field of enabling the public sector to transform the digital sector to serve the goals of sustainable development, Kuwaiti officials said Wednesday. The Director of Project Planning Department at the Central Agency of Information Technology in Kuwait Dina Al-Gharaballi told Kuwait News Agency (KUNA) on the sidelines of her participation in the second Arab High-Level Forum for the World Summit on the Information Society and the 2030 Agenda for Sustainable Development. In Beirut that "Kuwaiti government agencies are working to develop their services and use all means of communication technology with the public to facilitate access to services and transactions." And stressed the keenness of these government agencies to publish everything related to its transactions and services on the Internet. The next challenge in Kuwait is to achieve the stage of making transactions more integrated by simplifying the procedures and integrating the services, which includes many steps that combine more than one governmental body, pointing to the efforts being used in Kuwait to reach this stage. "Kuwait has published the national strategy for cybersecurity and work is under way on the project of linking the strategy of sustainable development with ICT," said Manal AlMazyad, head of public sector governance at Communication and Information Technology Regulatory Authority. She continued "CITRA is in the process of developing a cloud computing policy, a data classification policy and an information security policy that are all aimed at enabling the public sector to be digitized." She added that Kuwait's participation in the Forum helps to "inform us of the latest developments in the field of governance, policies and regulations and link them with Kuwait's efforts in this regard." The project coordination observer at the Central Agency of Information Technology, Assistant to Al-Dosari and the administrative coordinator of the agency, Abdulrazzaq Al-Khaled, will participate in the forum. The forum, which opened yesterday and will last until Thursday, will discuss the importance of linking the World Summit with the Information Society and the 2030 Agenda for Sustainable Development to achieve digital development that will help implement the goals of sustainable development. (March 20, 2019) citra.gov.kw

The Communication and Information Technology Regulatory Authority in coordination with the International Telecommunication



The Nepal Telecommunications Authority (NTA) has set Nepal Telecom's license renewal fee at NPR20 billion (USD179.9 million). The renewed concession will run for a further five-year period. Local technology site NepaliTelecom.com quotes Purushottam Khanal, the Acting Chairman of the NTA, as saying:

Union (ITU), organized the Regional Standardization Forum on Emerging Economic, Regulatory and Political Trends in a Changing Digital World, as well as the annual Regional Forum on Internet, Smart Cities and Data. Mr. Khalid Al-Kandari, Deputy Chairman at the Communication and Information Technology Regulatory Authority, appreciated the great confidence given by the International Telecommunication Union (ITU) to the Authority to give Kuwait the opportunity to host such an important event on its territory for the first time, which brings together the best minds working and developing the ICT sector in the region. The public and private sector are facing a major challenge towards becoming a society based on the digital economy in the world, which is living in the era of the Fourth Industrial Revolution, that is based on the techniques of digital transformation, which has become a major engine of innovation and which contribute to the renaissance of countries through the development of all public services. In addition to the main mission of the authority to oversee the optimal market of the communication and information technology and the development of appropriate regulatory policies to encourage investment and make Kuwait a gateway to communications and information technology in the Region. (March, 2019) citra.gov.kw

The Communications and Information Technology organized the events of "The Regional Cyber Security Week" in cooperation with the Arab Regional Cyber Security Center in the Sultanate of Oman (ITU-RCC). The week's events included the 7th Regional Cyber Security Conference in the 6th Regional Workshop on Cyber Drill Assessment. The Regional Group for the Arab Region of Sector Study Group 17 (SG17RG-ARB) also held the second meeting during these events and the sixth consultative meeting of heads of National Information Safety Centers to discuss areas of enhancing cybersecurity in the Arab Region and directing programs commensurate with the nature and needs of the region. CITRA's Chairman and CEO, Eng. Salim Muthib Al-Ozainah, pressed during his opening speech on the importance of the conference, especially that cybercrimes have significantly increased causing extensive harm, forming to be the largest concern for the Arab countries. He stressed the need to keep pace with development and preparation of plans and intensify cooperation and the exchange of experiences to address these risks. (March, 2019) citra.gov.kw

Nepal

'the decision to collect NPR20 billion from Nepal Telecom for the license renewal will apply for all the telcos.' Nepal Telecom is the country's largest mobile operator by subscribers, and claimed 20.497 million at end-December 2018, equivalent to a 52.8% market share. (March 19, 2019) nepaltelecom.com

The NTA has published the Quality of service of the mobile service providers, Ntc, Ncell, and Smart Telecom. The regulator had performed a drive test for the different areas on the month of Poush and Magh. The results are based on the analysis of the same drive test of the mobile operators (wherever available). Find the details of the quality of service of the telcos below. This is the second time NTA performed the drive test and published the report. Find the report of the first drive test here. This time, they visited different routes in Bhaktapur city, Pokhara city, Baglunj bazar and Prithvi Highway (Kathmandu to Kaski). Drive test is a method in which testing tools (mostly mobile handsets) mounted on a moving vehicle collect some metrics of the cellular network by repeatedly making voice or data calls. They performed the measurement of all the mobile service providers (wherever available) at the location at the same time. They configure the Drive test tools in such a way that the testing tools select the mobile network (2G/3G/4G) for the operators as per availability. The analysis of the measured data during the drive test provides the quality of service (QoS) report of the mobile operators. NTA published the same report in a tabular format for several areas where they performed the drive test. From the Drive test report, NTA found a more or less similar quality of service of Nepal Telecom and Ncell. In the city areas, Call connection time and call drop is found better in Ncell. Whereas HTTP Browsing delay, Ping test is better with Nepal Telecom. Nepal Telecom has a better quality mobile network in the Prithvi highway in terms of Call setup success rate, Call drop rate and Ping test. NTA also found the Smart Telecom to be the poorest among the three telcos.

(March 12, 2019) nepaltelecom.com

Nepal Telecom (NTC) and Ncell have participated in the first ever spectrum auction for residual spectrum in Nepal. The regulator NTA had first called for the auction in the residual spectrum on Poush 4, 2075. After a series of stay order and clearance from the Supreme Court, the first ever spectrum auction went smoothly. After the new decision from the Supreme Court, the deadline for the spectrum auction had finished on Thursday. As per the sources, only NTC and Ncell have filed their request for the spectrum. Among the three bands, it is only Ncell which applied for 900 MHz and 2100 MHz. As the main intention of NTA is to have competition in the spectrum auction, they will most probably extend the deadline for those bands. There are only 3 MHz remaining in 900 MHz whereas, for 1800 Mhz, there are 16

MHz available. The 2100 MHz has 40 MHz spectrum remaining to be sold. The requirement for a telco to participate in the auction is to have either a basic telephony service license or unified license. The applicants also should clear all dues including Royalty, RTDF, and spectrum fees. With the above requirements, Smart Telecom and UTL could not participate, as they have some dues to clear to the regulator. In the name of several titles, the two telcos have following dues.

Smart Telecom has a pending amount of 1 billion and 400 million (Rs 1.4 Arab)

UTL has a pending amount of 80 crores (800 million rupees)

So, only NTC and Ncell could participate in the auction. But for 1800 Mhz, both Nepal Telecom and Ncell applied. So, the auction process will begin for the residual frequency in this spectrum band. The residual chunk of 16 MHz has been put into the auction which will be competitively owned by the telcos. According to the procedure, there will be three levels of bidding. So the telcos can only increase the bid amount by 5 percent each time, as mentioned in the procedure. Here are the series of event associated with the first ever spectrum auction in Nepal:

- NTA had called for the spectrum auction in residual frequency bands of 900 MHz, 1800 MHz, and 2100 MHz bands, first on Poush 4, 2075.
- CG Telecom had once filed a petition to Supreme Court as they will be deprived of the allocated frequency spectrum and succeed for a stay order.
- NTA went to SC to vacate the stay order, which comes as per their petition.
- NTA started the auction process with the new deadline.
- SC again stays the auction process due to new petition, on Magh 16.
- SC again scraps the stay order for the auction process.

Ntc and Ncell take part in the auction. While the residual spectrum auction process was underway, Government provided 10 Mhz spectrum in 800 MHz bands to Nepal Telecom (NTC). Frequency allocation committee on Magh 29 decided to award 10 MHz of 800 MHz band to Nepal Telecom. The 800 MHz spectrum is suitable for 4G expansion in hilly and mountainous areas with a lot of remotenesses. As rural areas have less population density and dispersed livelihood, 800 MHz 4G networks would assure the wide coverage in such areas. Earlier Ntc had made deals for their 4G expansion project across the country, on which they will use the 800 MHz band along with 1800 MHz band.

(March 10, 2019) nepaltelecom.com



Pakistan

As the number of Wi-Fi Hotspots at public places keep increasing, PTA has come up with regulations to facilitate service providers and its users through proper check and balances. Last year, the authority published a draft and asked for public comments. The draft has now been finalized and notified to the appropriate stakeholders. Pakistan Telecommunication Authority (PTA) has notified "Data Retention of Internet extended to WiFi-Hotspots Regulations, 2018" aimed at facilitating service providers.

According to the rules, the owner of a public Wi-Fi hotspot will be required to maintain a log of the user information for a minimum of twelve months as opposed to the six 6 months proposed in the draft regulations. The regulator has introduced a mechanism for the registration, maintenance and retention of information of persons using data services through wi-fi hotspots in public places. As per the Telecommunications Policy 2015, provision of public Wi-Fi hotspots, based on international standards,

will be allowed for commercial use. PTA has put the necessary regulations encompassing appropriate adjustments in transmit power and hop length to ensure that the benefit from Wi-Fi is maximized within constraints of the ITU-R Radio Regulations and possible interference effects. In this context, a Wi-Fi hotspot is a Wi-Fi node that is attached to a fixed network and provides limited mobility access or fixed access. Therefore, backhaul for public Wi-Fi hotspots will be provided by a fixed network operator where such services are available. Mobile operators wishing to provide fixed or limited mobility public Wi-Fi services to their own customers may do so under a commercial arrangement with a fixed network operator. Wi-Fi offloading of mobile traffic to a Wi-Fi node linked to a mobile network or to a WiFi hotspot linked to a fixed network may be undertaken by mobile licensees. In the spirit of the license granted to a mobile operator, the Wi-Fi node linked to a mobile network may be used to provide offloading of mobile traffic only from its own subscribers and from those that are roaming on its network. The Wi-Fi node linked to a mobile network must not be used as a Wi-Fi hotspot that provides fixed or limited mobility services. PTA will ensure that consumer protection and other regulatory arrangements that apply to ISPs more generally

apply to Wi-Fi hot spots. These regulations shall apply to access providers and class licensing registration licensees with the mandate to register, maintain and retain information of people using data services through Wi-Fi hotspots at public places as prescribed under these new regulations. All Wi-Fi hotspot service providers are required to retain information/data of users from public Wi-Fi hotspots. Service providers/licensees will have to provide this user information to the authority or its authorized officers when required. Licensee(s) will have to observe technical expertise and arrangements, as provided in Class Licensing Registration Regulation, 2007, the draft of PTA regulation stated. The owner of a public Wi-Fi hotspot will be required to maintain a log of the user information for a minimum of twelve (12) months. In case of non-compliance with these regulations, the data services provided by the licensees as public Wi-Fi hotspot will be terminated. The licensees shall comply with all regulations, decisions, guidelines, procedures and instructions issued by the Authority for the establishment of Wi-Fi Hotspot as well as facilitation to the consumer, including all applicable law in force in Pakistan.

(March 6, 2019) propakistani.pk



The Communications and Information Technology Commission (CITC) has announced its current effort to develop the National Spectrum Strategy 2025. This project aims at improving the way radiofrequency spectrum is used by both its public and private users, ensuring that KSA becomes a global thought leader on radiofrequency use, actively enabling key elements of Vision 2030 (e.g. Digital Society, Smart Cities, Efficient government), while safeguarding spectrum needs that directly participate to KSA citizens' safety and wellbeing. CITC is keen to benefit from the participation of the public and is requesting comments from interested parties who wish to express their opinions and share expertise as input to aid development of the future National Spectrum Strategy 2025. All members of the public, including individuals, public organizations and commercial entities are invited to participate in this process by providing their views. CITC encourages Participants to support their comments with relevant data, analysis, benchmarking studies and information.

(March 14, 2019) citc.gov.sa

The Ministry of Communications and Information Technology (MCIT) and its initiative "Think Tech," Prince Sultan University in collaboration with Stanford University organized the second edition of "Women in Data Science" forum (WiDS). The forum is aimed at enhancing women's engagement in Data Science, Engineering and Computer Science. It also aims to expose the latest data science research in the Middle East by encouraging the exchange of ideas and interdisciplinary collaboration among local and international researchers and industry leaders, as well as inspiring and educating data scientists around the world as well as those interested in the field and supporting women and investing their strong quantitative and analytical skills.

Saudi Arabia

Including the 'Future Caravan Vehicle' by Think Tech, WiDS provided an opportunity to learn about the latest emerging technologies, latest research and data science applications, as well as a multidisciplinary brainstorming and collaboration platform among researchers in global data science networks. "The Ministry, through sponsoring this forum, sought to support and empower women in the ICT sector, indicating that this step is a natural extension of the Ministry's strategic orientation of 'Empowering Digital Saudi'. MCIT's participation came as a part of its efforts to invest women's energies and capabilities as a non-negligible real player, and educate them on the latest technical developments. This helps to seize the opportunities created by the Fourth Industrial Revolution through the Think Tech initiative that aims to look ahead and promote technical awareness through multiple means," said Mrs. Wadha Bin Zarah, Director of Women Empowerment at MCIT. Dr. Reema Al-Yahya, Deputy of PSU, pointed out that the forum was an embodiment of the leadership's vision in supporting and empowering women in all fields, especially in the field of data science. She emphasized that PSU is keen to encourage emerging and advanced technologies and thus enhance the role of women in enriching local content by scientific research, so that they contribute to developing and building a development renaissance of this good country. In addition, she extended thanks to MCIT and partners for organizing this successful and distinct forum. MCIT is paying growing interest to youth through organizing a number of events, all aimed at creating an environment conducive to the development of digital youth capacities and release of their creative potential, and to exploit their abilities and maximize their returns.

(March 5, 2019) mcit.gov.sa



Sri Lanka

Sri Lanka's Daily Mirror newspaper quotes the Minister of Telecommunication, Foreign Employment and Sports, Harin Fernando, as saying that the collapse of an innovative broadband project in the country – Google Loon – ultimately resulted from the Telecommunications Regulatory Commission of Sri Lanka (TRCSL's) failure to provide the required spectrum for the project. Speaking at a forum organized by Institute of Policy Strides in Colombo last week, Fernando said: 'We wanted to do a pilot for Google Loon project, and they did the pilot. It was successful. However, the TRCSL didn't give them the license or the required

spectrum.' He claimed that if the project had been able to continue, 'Sri Lanka would have attracted the attention of the world while getting island wide 4G coverage'. He reportedly identified a lack of technical knowhow and understanding among older policymakers as a bar to making future progress in Sri Lanka's digitization initiatives noting: 'When you talk about technology, it's only the younger generation which understand it, but the older generation think it's something strange and wrong and it is going to corrupt everything. That's the mindset that we want to change.'

(March 25, 2019) telegeography.com



Turkey

Turkey's Competition Authority has launched an investigation into Turk Telekom (TT) based on preliminary findings that the fixed and mobile operating group violated competition laws. The initial investigation found that TT had abused its dominant position in

the wholesale fixed broadband internet services market and 'made it unreasonably and unfairly difficult for competitor companies to render services and gain subscribers in retail services'.

(March 20, 2019) The Daily Sabah



United Arab Emirates

The UAE, represented by the Telecommunications Regulatory Authority, TRA, has participated in the 20th Meeting of the GCC e-Government Executive Committee, in Muscat, Oman. The TRA delegation included Hamad Obaid Al Mansoori, TRA Director-General, Salem Al Housani, Deputy Director-General for Information and e-Government Sector, and Adel Al Mehairi, Senior Manager of aeCERT. The meeting discussed two initiatives submitted by the UAE. One of them was the creation of a top-level domain (.GCC) to represent the Gulf identity. This will enhance and maintain the GCC presence in the ICT field, as well as develop and support the spread of GCC websites and providing new options for the internet community in the region. The UAE's (.GCC) top-level domain was presented to the members of the Executive Committee. The meeting also discussed efforts needed to implement this initiative and its registration procedures. The UAE reported that a number of ICANN legislations have been amended to prevent domain registration of non-qualified parties. The presentation also discussed the importance of conducting a feasibility study for the project, followed up by a specialized GCC team, and if the study results indicated positive feasibility, the subject should be referred to the GCC Ministerial Committee for Post and ICT for instructing on opening the ICANN registration. The second initiative was related to the development of the GCC e- Portal, and identifying the development aspects that need to be supported as per best international practices as well as the level of development in the GCC e-presence. The TRA working

paper reviewed the status of the portal, figures of the portal visitors in 2018 compared to 2017. The working paper proposed testing the portal for user experience in a specialized lab such as the UX Lab of the UAE Centre of Digital Innovation, CoDI. It also recommended simplifying the process of obtaining information, in addition to developing the portal design in line with the latest international developments, activating the e-participation on the portal, including participatory topics such as e-Consultations, blogs, chats and a successful experiences' corner. The paper also recommended enriching the "Gulf data" on the e-portal by adding joint GCC data systems, adding links to all official data sites in the Gulf States, as well as publishing all data pertaining to policies, legislation, manuals, reports and working papers. TRA Director-General commented, "The UAE is keen on strengthening the Gulf Identity in the Arab e-presence online, thus, TRA proposed the two initiatives. The top-level domain initiative (.GCC) aims to preserve and enhance the Gulf identity. Moreover, the GCC portal initiative aims to enhance the GCC e-presence online, through the posting of information, services and GCC data on the portal." He added, "We are proud to work with our brothers in the GCC to shape our future in the field of electronic and smart transformation, and to share experiences in the field, especially that the UAE has reached the sixth position globally in Online Services Index, OSI, and it is seeking to achieve the third position in the next edition of the UN E-Government Survey." The meeting discussed numerous initiatives proposed by the GCC countries, including

a periodic report on e-government achievements, strengthening the information security framework, a benchmarking model for the implementation of the e-government guiding strategy, conducting a business continuity study in emergencies in the GCC countries, in addition to the UAE initiatives of developing the GCC e-government portal and the .GCC top-level domain.

(March 26, 2019) wam.aen

The Telecommunications Regulatory Authority (TRA) has announced a new regulatory framework for early termination charges of UAE licensees' service contracts. The new amendment stipulates charging one month fee only for early termination, replacing the previous provision, which stipulated charging one month rent multiplied by the number of the contract's remaining months. This amendment has been introduced already in the new individuals' mobile contracts. TRA is currently working on introducing these amendments to the other services' contracts in the coming period. These amendments confirm TRA's keenness to apply the best international standards on services provided by licensees in the UAE and to provide more freedom and flexibility to users in choosing the services they desire. This decision also comes in the context of the consolidation of all termination fees of service contracts that impose termination charges, making it easier for customers to calculate the costs of the services they wish to use. On these amendments, Hamad Obaid Al Mansoori, TRA Director General, said: "At TRA, we strive to hear the comments of the stakeholders on the operators' services, and we don't hesitate to review any policies or regulations for the interests of the parties and the public, to increase the happiness of the telecom sector customers in the country, according to the directives of our wise leadership. Revision of early termination fees of telecom contracts is part of the sustainability approach whereby TRA is working to enhance the quality of telecom services and to ensure that these services reach the various segments of society on satisfactory terms." Moreover, Eng. Mohammed Al Ramsi, Regulatory Affairs Director said: "The new regulatory framework of service termination fees gives the users more flexibility in choosing the services that suit them." He added: "The new amendment comes in response to the complaints of some customers, since the previous provisions forced the customer to commit to using the service until the end of the contract, despite their unwillingness to do so sometimes. Now, the user can terminate the service contract and choose another service, for a simple charge equals one month fee, which is considered operational fees. In TRA, we ensure that we will continue our mission of monitoring the market to ensure the implementation of the new provisions." These amendments are in line with the TRA's commitment to the vision and directives of the wise leadership in making happiness a lifestyle in the UAE and the ultimate goal of the government work. It also reflects TRA's commitment to the Customer Happiness Charter, which includes the provision of fast, easy and smart services, to achieve customer happiness and contribute to the prosperous future of the UAE. (March 20, 2019) zawya.com

The Telecommunications Regulatory Authority, TRA, has announced the launch of a free online course on "e-Participation" on the Smart Government Virtual Academy website. Hamad Obaid Al Mansoori, TRA Director General, said, 'Most countries

in the world today call for activating e-participation, due to its key role in building the countries' strategies, setting future plans and achieving sustainable development. The UAE, under the directives of our wise leadership, has given great importance to e-participation, as it engages the UAE community with all its segments in the decision-making process. E-participation allows UAE citizens and residents to contribute in the development of future plans and strategies, through providing their opinions and suggestions using online e-participation channels adopted and integrated in the government and federal entities websites as well as on the trusted social media channels.' Al Mansoori indicated that the UAE Government strives to provide all the services that spread happiness among all member of the community, and to reach this goal, the public's views must be heard and understood. He said, "Modern technologies and ICT revolution have facilitated communication between the citizens and decision-makers. Thus, TRA has launched many initiatives that support e-participation, including training courses, in order to introduce all members of community of various levels and interests to its importance, as well as the way to use it, for effective contribution in making better decisions. This would accelerate the process of sustainable development and contribute to the achievement of the National Agenda and the UAE Vision 2021." The e-participation course will address the concept and tools of e-participation, and the new conceptual framework for e-participation from the UN perspective. The audience will be able to learn about e-participation supervision in the UAE, how public administrations deal with the social media and social communication, and the best way to engage various social groups such as youth, people of determination and senior citizens in the process. Moreover, it addresses the most pillars of the e-participation strategy, and content management. The course is now open for registration for any UAE citizen or resident, free of charge. The UAE has achieved great progress in e-participation, ranking sixth globally, ahead of Taiwan and Finland, according to IAC International Digital Government Rankings Report published by the Institute of Digital Government at Waseda University in Japan. The UAE has a comprehensive e-participation platform (sharik.ae) which contains numerous e-participation channels such as consultations, blogs, Feedback and suggestions, Forum, innovative idea, polls and social media channels.

(March 19, 2019) zawya.com

Addressing a UN statistical meeting, the UAE stressed the need for international joint action and cooperation to harness latest technology to reach the Sustainable Development Goals 2030. In his address before the 50th session of the UN Statistical Commission in New York, Abdulla Nasser Lootah, Director General of the Federal Competitiveness and Statistics Authority (FCSA), said advanced technologies of artificial intelligence and data revolution are instrumental in the delivery of the Sustainable Development Goals 2030. He stated that the Dubai Declaration, issued at the end of the UN World Data Forum 2018 calls for ensuring sure that quality, relevant, timely, open and disaggregated data; working in a collaborative manner to bring all data communities together to implement the CTGAP, our common framework for the modernization and strengthening of statistical systems, and the design and implementation of country-led statistical capacity building activities necessary to achieve the

2030 agenda and undertake key actions under the six strategic areas of the CTGAP and establish partnerships to leverage the power of new data sources and technologies to provide data to inform decision-making and investment, while ensuring the central role of national statistical offices as they work under a mature framework of principles and practices to assure that statistical data products meet the highest standards. The session is being held by the UN Statistical Commission, UNSC, from 5th to 8th March under the theme, 'Better data, better lives'. The UNSC brings together Chief Statisticians from UN Member States, and

is the highest decision-making body for international statistical activities. The Commission consists of 24 member countries of the UN elected by the Economic and Social Council (ECOSOC) on the basis of an equitable geographical distribution. Agenda of the meeting include six items: data and indicators for the 2030 Agenda for Sustainable Development; fundamental principles of official statistics; open data; regional statistical development; national accounts; and international migration statistics and demographic statistics. 

(March 10, 2019) zawya.com

REGULATORY ACTIVITIES BEYOND THE SAMENA REGION



Albania

The telecoms watchdog the Electronic and Postal Communications Authority (Autoritetit Te Komunikimeve Elektronike Dhe Postare, AKEP) has approved the sale of a 99.757% stake in Telekom Albania to Bulgarian-owned firm Albania Telecom Invest. The sale still requires clearance from Albania's competition regulator, however. Greek telco OTE had agreed to sell its entire stake in the operator to Albania Telecom Invest

in January this year for a total consideration of EUR50 million (USD56.2 million) and expects to finalize the transaction in the first half of 2019. For its part, Albania Telecom Invest is controlled by Bulgarian businessman Spas Roussev – the controlling shareholder of Bulgarian fixed line incumbent Vivacom (registered as Bulgarian Telecommunications Company or BTC) – and by Albanian-Bulgarian investor Elvin Guri.

(March 29, 2019) SeeNews



Argentina

In a decision announced by Argentinian President Mauricio Macri, the National Communications Agency (Ente Nacional de Comunicaciones, ENACOM) has committed to freeing up 450MHz spectrum to improve rural connectivity. In conjunction with the Secretary of Agribusiness, ENACOM personnel have supervised

the creation of the Rural Connectivity Board (Mesa de Conectividad Rural), which will facilitate access to the spectrum. According to ENACOM, the 450MHz frequencies will be available to small/medium-sized local providers who wish to provide broadband and fixed line telephony. (March 15, 2019) telegeography.com



Australia

The Australian Communications and Media Authority (ACMA) supported the country's competition watchdog in calling for increased oversight of digital platforms and steps to bring them more fully into the country's regulatory framework for content. ACMA proposed a new regulatory framework be developed that is principles-based, outcome focused, founded on a communications stack model and which allows for different regulatory approaches. In December 2018 the Australian Competition and Consumer Commission (ACCC) proposed in a preliminary report a new or existing regulatory body be given the authority to monitor digital platforms such as Facebook and Google, to determine the impact their dominance has on the online search and advertising markets. ACMA chair Nerida O'Loughlin said in a statement that ACCC "has made a clear case for bringing digital platforms into the

regulatory framework for content delivery". She added: "We also consider that a single regulatory framework for content delivered across any platform should have oversight by a single content regulator, in consultation with local and international regulators." ACMA noted the digital platforms have significant market power and influence, particularly regarding news and journalistic content, but are not fully considered within current media and communications regulation. "There is an undeniable shift in public sentiment towards the view that digital platforms should do more to regulate their behavior," O'Loughlin said. "These platforms have the technological smarts to find ways to address such concerns. If they don't, then consumers expect that government and regulators will step in." ACMA will "work closely with the ACCC and other relevant agencies in any new regulatory role", she said.

(March 6, 2019) mobileworldlive.com



Austria

The Regulatory Authority for Broadcasting & Telecoms (RTR) has announced the results of Austria's 5G spectrum auction, in which a total of EUR187.7 million (USD211.5 million) was raised. Seven bidders were granted licenses to utilize spectrum in the 3.4GHz-3.8GHz bands, including the three incumbent mobile network operators (MNOs) – each of which secured spectrum for all twelve designated regions – and four additional players, which bid for regional spectrum allocations. A1 Telekom Austria was the highest

bidder, paying a total of EUR64.3 million, followed by T-Mobile Austria with EUR56.9 million and Hutchison Drei Austria, which paid a combined EUR51.9 million. Regional player LIWEST acquired 80MHz for each of Linz and Upper Austria for EUR5.3 million, while another local operator, Salzburg AG, paid EUR4.4 million for spectrum in Salzburg city (80MHz), Salzburg state (80MHz) and Styria (40MHz). Rounding out the winners, Holding Graz bid EUR3.0 million for frequencies in Graz (50MHz) and Styria (40MHz), while

MVNO MASS Response acquired a 30MHz allocation for the Lower Austria and Burgenland region for EUR1.8 million. Spectrum licenses are valid for 20 years until 31 December 2039. 'This was a first, very successful step in the direction of a rapid implementation of 5G in Austria,' commented RTR head Johannes Gungl, adding: 'The EU sees 80MHz-100MHz as an efficient value to introduce 5G broadband wireless services.

With the award of the 3.4GHz-3.8GHz band now concluded, the three Austrian mobile operators A1, T-Mobile and Drei were even able to win 100MHz to 140MHz of continuous frequency usage rights in all twelve advertised regions. This puts us in the top 5G European group in terms of contract award, frequency and equipment.'

(March 8, 2019) telegeography.com



Brazil

The Board of Directors at Brazil's National Telecommunications Agency (Agencia Nacional de Telecomunicacoes, Anatel) has approved its Regulatory Agenda for 2019-2020, which will involve the study a number of spectrum bands for future 5G

use. Frequencies under consideration include: 700MHz, 2.3GHz, 3.3GHz-3.4GHz, 3.5GHz and 26GHz. The watchdog says that by publicizing the agenda it seeks to bring transparency and efficiency to the regulatory process. (March 22, 2019) telegeography.com



Canada

The Canadian Radio-television and Telecommunications Commission (CRTC) has launched a review to examine the state of the mobile market and whether further action is required to improve choice and affordability for Canadians. The CRTC is also seeking comments on its preliminary view that MVNOs should have mandated access to the networks of the national wireless providers Bell, Rogers and Telus until they are able to

establish themselves in the market. The Commission is also looking ahead to the future of mobile services in Canada and in particular at whether regulatory measures are needed to facilitate the deployment of 5G network infrastructure. Canadians are invited to share their views by 15 May 2019. The CRTC will hold a public hearing starting on 13 January 2020 as part of its review. (March 4, 2019) telegeography.com



Chad

The government has awarded a contract for the technical, commercial and financial management of a fiber link between N'Djamena and Adre to Chadian-Sudanese joint venture SUDATCHAD, Journal du Tchad reports. In a statement, the government explained that the move was in line with the telecom ministry's program for the development of fiber-optic infrastructure 'to link Chad to international networks and to interconnect the main cities of the country, provinces and departments in order to make broadband

internet accessible throughout the national territory.' The system spans just under 800km and connects the capital with Adre on the Sudanese border. Work started on the network back in 2014, but the government has ramped up its efforts to make the link operational over the last two years, with the incoming telecom minister in January 2019 declaring that the commissioning of the 'N'Djamena-Adre optical fiber segment' was one of his key policy objectives.

(March 28, 2019) telegeography.com



Chile

Chilean telecoms watchdog the Department of Telecommunications (Subtel) has proposed lowering the termination fee for fixed and mobile calls to Movistar's fixed network from CLP3.7 (USD0.0055) per minute to CLP0.8 per minute. The operator had argued for the rate to be increased to CLP5.7 per minute, but Subtel dismissed the request, noting that it went against the global trend. The regulator also highlighted Movistar's continued dominance in the fixed telephony space, with the telco claiming a market share of 41.2% in September 2018 – more than the next three providers combined – according to Subtel. Movistar had until 13 March to file an appeal against the decision.

(March 11, 2019) telegeography.com

The Constitutional Court has summoned sector watchdog the Department of Telecommunications (Subtel) in relation to the legal battle over the return of spectrum stemming from the controversial 700MHz license award. An appeal has questioned the clarity in Subtel's instructions, limiting the cellco's ability to comply with the order. As previously reported by TeleGeography's CommsUpdate, in June last year the Supreme Court found that Entel, Claro and Movistar had engaged in anti-competitive behavior by ignoring spectrum limit rules in bidding for airwaves in the 700MHz band in 2014. The court ruled that the companies would be required to hand back an amount of spectrum equal to their award in that auction – i.e.

2×10MHz for Movistar and Claro, 2×15MHz for Entel – although the returned airwaves could be from any band, not necessarily the 700MHz range. The trio have fought efforts to force their compliance with the order, however, arguing that the return of frequencies was not required because the regulator was working on new allowances that would permit them to keep the frequencies. The cellcos also claimed that they could not comply with the demand as there were no existing instructions or guidelines on such measures. The Constitutional Court awarded the companies a stay on the order in January 2019, giving the cellcos more time to argue their case. In the most recent appeal, the cellcos challenged the lack of definitions in Subtel's

order for 'adequate and timely compliance' with the Supreme Court's ruling. Further, the trio noted that the regulator had not provided guidance on how the conditions of how the ruling should be executed. The operators claimed that they were limited to enacting the measures in a way – and over a time period – that does not harm consumers, whereas a more immediate implementation would create 'unnecessary, absurd and irreparable damage to the telecommunications system' of Chile. Consequently, the court has summoned Subtel to provide further information on the case and to explain how the operators should enforce the decision.

(March 6, 2019) *Diario Financiero*



Colombia

The Ministry of Information Technology and Communications (MinTIC) has confirmed that it expects to stage its long-delayed auction of 700MHz spectrum in October this year. Announcing the plans, Ivan Antonio Mantilla, the Deputy Minister of Connectivity and Digitalization, commented: 'In the second half of this year, the 700MHz band auction will

be executed. Rural areas, including the department of Boyaca, will be prioritized for broadband coverage.' MinTIC published Resolution 585 of 2017 on 24 March 2017, inviting interested parties to express their interest in its planned auction of frequencies in the 700MHz band. The auction will comprise spectrum in the 703MHz-748MHz and 758MHz-803MHz bands.

(March 6, 2019) *telegeography.com*



Czech Republic

The regulator CTU plans to start the 5G auction for frequencies in the bands 700 MHz and 3.4 GHz in November. The regulator would like to attract a fourth player to the market. CTU is in the final stage of completing the auction rules and has sent the auction timetable to the government, which will discuss it during March. In April, a public consultation will start. The auction will be successful if it manages to attract a fourth mobile operator to compete with the current big three MNOs, namely O2 Czech Republic, T-Mobile Czech Republic and Vodafone Czech Republic, CTU

Chairman Jaromir Novak told Reuters. One block in the band 700 MHz will be reserved for a newcomer. Also, existing MNOs will be obliged to provide national roaming to the new player on condition that it covers 10 percent of the population by itself. The price model and time limits, from five to six years, are still subject to discussion. Although it was originally speculated the state would not assign the spectrum in an auction at all, but rather build the 5G infrastructure itself, CTU issued updated 5G auction principles in January.

(March 4, 2019) *patria.cz*



Estonia

The Circuit Court of Tallinn has suspended the government's auction of 5G spectrum in the 3.6GHz (3410MHz-3800MHz) band following a complaint about the rules of the tender. The suspension, which came on the same day as the deadline for bidder applications, prohibits the start of the competition until at least 21 April. Levikom Eesti, a provider of IoT and fixed-wireless internet services, had filed a complaint saying that the government's decision to offer only three licenses in the 3.6GHz band favors the country's trio of incumbent cellcos, while also hampering competition.

In addition, Levikom says that it is currently utilizing frequencies in the same band for its existing services and regulations covering the transfer of spectrum have not been followed. The firm wants the auction to provide four or more concessions, with at least one dedicated to 'regional use for industrial consumers, medical institutions and regional operators'. Estonia's three incumbent mobile operators – Telia, Elisa and Tele2 – had all indicated that they intended to take part in the 3.6GHz auction.

(March 26, 2019) *telegeography.com*



Germany

A court dismissed complaints from Vodafone Germany, Deutsche Telekom and Telefonica Deutschland about the country's 5G auction terms, clearing the way for the sale to begin. All three operators had contested the conditions attached to the acquisition of licenses for 5G frequencies, with Vodafone and Telefonica subsequently seeking to delay the auction through emergency applications. However, a court hearing in Cologne dismissed both operators' concerns and applications to stall the procedure. A bid by ISP Freenet to increase obligations placed on mobile operators was also turned down. In its translated decision the court said the terms deemed appropriate for the auction by regulator Bundesnetzagentur were lawful. These include strict targets related to providing coverage across the country's roads and public transport network, in addition to special provisions for a new entrant. It added: "The Bundesnetzagentur has discretion in regulating the conditions for the award of frequencies, which can only be examined in a limited way in court. Its limits have not been exceeded here." Dismissing the urgent requests to delay the auction, it concluded: "A timely auction of the 5G frequencies is a significant public interest. By contrast, the concerns asserted by the applicants are less important." The court said its decision is final and cannot be appealed. Following the conclusion of the hearing Bundesnetzagentur confirmed the auction would begin as planned tomorrow at 10am CET. Four bidders have been cleared to take part in the auction: the country's three existing mobile operators, along with MVNO and internet service provider United Internet through subsidiary 1&1 Drillisch. (March 18, 2019) [mobileworldlive.com](#)

Telecom regulatory body, the Federal Network Agency (BNetzA), announced that it is preparing to allocate frequencies for local 5G networks in the second half of this year. BNetzA said companies will be able to apply for spectrum in the 3.7-3.8 GHz band for use in industrial applications. Industrial firms Volkswagen, Daimler Siemens and BASF have all indicated interest in local 5G networks for automation and industrial IoT applications. "There is great potential for 5G, especially in the industrial area," said Jochen Homann, BNetzA President, according to Reuters. "We want to make frequencies available for companies to build local networks that exactly meet their needs." The allocation is separate from the spectrum auction BNetzA plans to begin later this month for national 5G licenses. BNetzA has been accepting applications for national 5G licenses since November 2018 amid concerns that Germany might fall behind its European neighbors in connectivity. Deutsche Telekom, Vodafone and Telefonica Deutschland, which together make up Germany's top three wireless providers, are all expected to participate in the national license auction. But complications may arise in deploying 5G networks. All three operators have also held 5G trials with Huawei,

in frequencies ranging from 3.4-3.8 GHz. Earlier this year, an internal document from Deutsche Telekom indicated that the company could face up to two years of delays in rolling out 5G networks if Germany decides to ban Huawei equipment. Huawei products and systems are currently installed in thousands of its wireless towers, according to a report from Bloomberg. The U.S. has been pushing other countries to ban Huawei network equipment from 5G deployments over security concerns. Germany has resisted those efforts, affirming over the weeks that it doesn't want to ban Huawei products. Last week, BNetzA released security guidelines for wireless operators building out 5G networks, which state that equipment "may only be sourced from trustworthy suppliers whose compliance with national security regulations and provisions for the secrecy of telecommunications and for data protection is assured," according to a report from ABC News. The guidelines indicate that wireless operators should source equipment from several different manufacturers and should build in redundancy for key components. It also states that network traffic must be regularly monitored, and security-related components must be certified by Germany's IT security agency.

(March 11, 2019) [fiercewireless.com](#)

The Federal Network Agency (BNetzA) has published a list of additional security requirements for telecommunications networks and services. The requirements refer in particular to operators of public telecommunications networks with a high potential threat, the Agency said in a statement. The essential elements of the new security rules include the sourcing of systems only from trustworthy suppliers that follow national security regulations and provisions for the secrecy of telecommunications and for data protection, constantly monitoring the network traffic, the certification of security-related network and system components (critical key components) by the Federal Office for Information Security (BSI) and IT security checks by an approved testing body of the BSI. In addition, operators have to give proof that the hardware tested are actually deployed in the products used to build a network, "monocultures" have to be avoided by using network and system components from different manufacturers, and only professionally competent, reliable and trustworthy contractors should be employed to source system-related process. Finally, adequate redundancy must be available for critical, security-related network and system components. The BSI and the Federal Commissioner for Data Protection and Freedom of Information (BfDI) have written the requirements. A draft of the new security regulation is planned for spring 2019. The Federal Network Agency will publish the final version of the requirements after receiving comments from manufacturers and associations. The Telecommunications Act will be amended in a second step to clarify that the security

requirements bind the network equipment suppliers. The German government has been debating the possibility to introduce new security rules following international concerns over Huawei and ahead of the 5G spectrum auction starting 19 March. The Chancellery

wants in fact to avoid the exclusion of Huawei. The fear is that China can retaliate with punitive actions against Germany if Huawei were banned.

(March 8, 2019) telecompaper.com



Guyana

The government and fixed line incumbent Guyana Telephone and Telegraph Company (GTT) have signed a memorandum of understanding (MoU) for the planned liberalization of the nation's telecoms markets. A joint statement from the parties acknowledged that, although the agreement is non-binding, it nevertheless represents 'a major step towards liberalizing Guyana's telecommunications market'. Under the MoU, both parties have agreed to continue discussions on unspecified outstanding issues with the aim of finalizing a binding agreement. Minister of Public Telecommunications Catherin Hughes was quoted as saying of the agreement: 'After many years of delays, this government has brought the country one step closer to achieving a fully open telecommunications market. While more work needs to be done, the government is committed to continuing discussions and completing the process of liberalization for the citizens of Guyana.' GTT currently holds monopolies on international voice

and data services, as well as fixed line telephony. The government began efforts to liberalize the market as early as 2009, but warnings from GTT and its parent company Atlantic Tele-Network (ATN) that terminating the telco's exclusivity would entitle the firm to damages and compensation prompted Georgetown to abandon the reforms. The government finally passed a pair of bills in 2016 that would overhaul the regulatory framework for the sector, including ending GTT's monopolies. Implementation of the new legislation has been similarly delayed, however, as the government has sought to reach a consensus with GTT for the end of its monopolies that would avoid the risk of legal action by the telco. More recently, the matter was complicated further when it emerged that Guyana's tax authorities were pursuing a claim for USD44.1 million from GTT, relating to deductions for intercompany advisory fees and other tax assessments dating back to 1991.

(March 7, 2019) Demerara Waves



Hong Kong

Hong Kong operators HKT, SmarTone and China Mobile Hong Kong have all been granted spectrum in the 26-GHz and 28-GHz frequency bands for 5G use. The three operators, which had each applied to be assigned spectrum across the two bands, have each been offered 400 MHz of spectrum on a provisional basis by telecommunications regulator OFCA. The applicants were all found to have fulfilled the required licensing criteria to be granted assignment of the non-shared spectrum. The administrative assignment of the 26-GHz and 28-GHz spectrum will be followed up with the auction of 380MHz of spectrum in the 3.3-

GHz, 3.5-GHz and 4.9-GHz bands in the middle of the year. Hong Kong's second largest operator by market share 3 Hong Kong declined to apply to be assigned 26-GHz and 28-GHz spectrum, opting instead to rely on its existing airwaves and the spectrum it expects to be able to acquire in the upcoming 5G auction. In addition, 3 Hong Kong cited factors including OFCA's requirement that operators establish thousands of radio units compatible with the spectrum within five years of the assignment, as well as the shortage of announced devices that support the two frequency bands. (March 24, 2019) telecomasia.net



India

The Telecom Regulatory Authority of India (TRAI) has not yet received a communication from the Department of Telecommunications (DoT) regarding the allocation of 4G spectrum to state-backed providers Bharat Sanchar Nigam Limited (BSNL) and Mahanagar Telephone Nigam Limited (MTNL), the Economic Times cites a senior official at the regulator as saying, challenging the government's claims earlier this month that it had sought a recommendation from the watchdog on the matter. The two telcos have sought the airwaves as part of a revival program that aims to keep the struggling operators afloat and competitive. The duo lack the spectrum resources to launch 4G

services, however, and risk being left behind by their privately-owned competitors. BSNL had submitted a proposal for spectrum back in 2017, asking for 5MHz of 2100MHz frequencies in almost all circles, for which it would pay around INR140 billion (USD2 billion) – 50% to be paid upfront and financed by an equity infusion, whilst the remainder would be paid in ten equal instalments. Complicating matters, though, is a 2012 Supreme Court decision which states that natural resources such as spectrum can only be sold through a public auction. The DoT said earlier this month that it had asked the TRAI for its opinion on a BSNL's proposal, to assess whether government-owned

entities might be exempted from the Supreme Court's rule. A TRAI official has now denied that such a request has been made, saying: 'the regulator would have come out with its suggestions in the earliest possible manner, if it had been asked to do so.' The statement casts doubt on the long-delayed process and is likely re-write the schedule for BSNL's nationwide 4G launch: the provider has begun testing the technology and is aiming for a full commercial launch by the end of the year. (March 25, 2019) *The Economic Times*

The Department of Telecommunications (DoT) has sought the view of sector watchdog the Telecom Regulatory Authority of India (TRAI) on the possibility of assigning 4G spectrum to state-backed provider Bharat Sanchar Nigam Limited (BSNL) outside of an auction, the *Economic Times* reports. A 2012 Supreme Court decision ruled that all natural resources – including spectrum – may only be sold through a public auction, but the TRAI has been asked to determine whether government-owned entities could be exempted from the rule. BSNL has steadily fallen behind its privately-owned rivals in recent years, and the price war sparked by the launch of Reliance Jio Infocomm (Jio) in late 2016 has only deepened the operator's financial crisis; indeed, the company was forced to delay salary payments for its workforce last month due to cash-flow issues. BSNL sees the long-delayed introduction of 4G services as essential to its recovery and has

requested 5MHz of 2100MHz band spectrum, worth around INR138.9 billion (USD2.0 billion). BSNL has suggested an upfront payment of 50% of the cost via an equity infusion, whilst the remaining 50% would be paid in ten equal instalments. (March 18, 2019) *telegeography.com*

The Department of Telecommunications (DoT) is expected to ask Bharti Airtel and Tata Teleservices Limited (TTSL) for bank guarantees totaling around INR150 billion (USD2.15 billion) for approval of the latter's takeover by Airtel. The *Economic Times* quotes an unnamed DoT official as saying that the duo will have to provide guarantees related to spectrum usage charges (SUC) and one-time spectrum charges (OTSC). The DoT is due to issue demand notices shortly, according to the source, but expects the request to be challenged by the cellcos. The OTSC fee in particular is likely to be contentious, as the price is based on adjusted gross revenue (AGR), the definition for which is the subject of a long-standing – and ongoing – legal dispute. The cash and debt-free acquisition was first agreed in October 2017 and, with a view to accelerating the regulatory approval process, the pair announced in October 2018 that Airtel would take on the necessary liabilities to complete the transaction, including covering license fees and spectrum charges. Despite Airtel taking responsibility for the payments, TTSL parent Tata Sons is nevertheless expected to provide the funds for the outstanding fees.

(March 12, 2019) *The Economic Times*



Italy

Italian communications regulator Agcom has approved a resolution requiring operators to use color-coded labels when advertising their fiber-optic offers. Operators will now have to specify the technology used to provide the fixed broadband service in all their communications with the public via color-coded "F", "FR" or "R" symbols. The green "F" symbol refers to fiber-to-the-home (FTTH or fiber to fiber interconnections), the amber "FR" symbol refers to fiber-to-the-curb (FTTC) or fixed-wireless access (FWA) while the red "R" symbol refers to fiber-to-the-node (FTTN) with

copper or wireless interconnections. The watchdog added that providers are required to explicitly clarify the technical specifications of the proposed fixed broadband offers, both in the contractual and pre-contractual phase, so that customers have a clear idea of the expected performance. The move comes after antitrust watchdog AGCM has issued a fresh warning to the operators Telecom Italia (TIM), Wind Tre and Fastweb over the use of misleading advertising in the promotion of their respective fiber-optic services.

(March 5, 2019) *telecompaper.com*



Japan

The Japanese government this week approved an amendment to the Telecommunications Business Law which is designed to lower fees for mobile services in the country following sustained criticism of mobile network operators (MNOs) charging higher rates than many other countries. The cabinet of Prime Minister Shinzo Abe approved the proposed Bill which bars mobile carriers from offering service plans that bundle both the price of the handset itself and connection fees. Currently, mobile operators NTT DOCOMO, Softbank Corp and KDDI (au) typically retain high data use

charges in return for subsidized phones – a system that some suggest is overly complicated and allows them to keep fees artificially high. Instead, under the proposed amendment the MNOs will have to separate out the costs levied for devices/services which Abe's administration hopes will ultimately lead to increased competition and lower prices, communications minister Masatoshi Ishida told a press conference following a cabinet meeting. It is understood that SoftBank Corp and KDDI have already confirmed they will comply with the new rules, while NTT DOCOMO has

committed to adopting new plans from spring 2019. The changes are expected to level the playing field and put the big three on a similar footing to MVNOs which

currently command roughly 10% of the overall market. The amendment is expected to pass during the current Diet session (i.e. through June). (March 6, 2019) *Kyodo News*



Luxembourg

Speaking in parliament, Luxembourg Prime Minister Xavier Bettel has indicated that the country is planning to stage 5G pilot projects at the end of this year. The PM noted that all three incumbent mobile network operators – Post Luxembourg, Tango and Orange – have expressed an interest in participating in the trials, which will take place under the 'Digital Luxembourg' banner. Commercial 5G services have been earmarked for 2020, the official added. In September 2018 Digital Luxembourg's ICT infrastructure team defined its

national 5G strategy, which was officially launched by Bettel. The strategy defined the five potential 5G pilot zones as: Kirchberg; Belval and the University of Luxembourg; the Automotive Campus in Bissen; the CFL Logistics Center in Dudelange; and the country's national transport networks. According to Digital Luxembourg, the frequencies set aside for 5G use are: 700MHz, 3.4GHz-3.8GHz and 26GHz millimeter wave (mmWave) spectrum.

(March 26, 2019) *telegeography.com*



The Netherlands

The National Communications Authority (Nasjonal kommunikasjonsmyndighet, Nkom) has confirmed that it is aiming to allocate spectrum in the 700MHz and 2100MHz bands via an auction which will commence in June 2019. In a press release regarding its plans, the regulator noted that it expects to publish the final auction rules for the sale process next month, with a deadline for registering to take part scheduled for May 2019. With test auctions then planned for the latter half of May 2019, the auction itself would then begin in the first week of June. The Nkom has, however, noted that all timings are subject to change. The watchdog previously revealed in July 2018 that it intends to make available a total of 2x30MHz in the 700MHz band and 2x15MHz in the 2100MHz band. Separately, the Nkom has also revealed that, with mobile network operator (MNO) ice's existing license for spectrum in the 450MHz band due to expire at the end of this year, it has called for parties interested in applying for frequencies in this band to do so by 26 April. With the regulator confirming that a 2x5MHz block in the band will be available, it has specified that the license which it will offer will include a requirement to cover 30% of the country within five years the concession being awarded. Meanwhile, alongside detailing its plans for the 450MHz, 700MHz and 2100MHz bands, the Nkom has also confirmed that there will be a total frequency cap applied on the spectrum MNOs hold below 1GHz. Operators will, it said, be restricted to having no more than 2x35MHz across the 450MHz, 700MHz, 800MHz and 900MHz bands. In a final Nkom-related development, the regulator has also announced the adoption of new fixed termination rates. With the charge currently limited to a maximum of NOK0.006 (USD0.0007) per minute, it has confirmed that from 1 July 2019 the cap will be reduced to NOK0.005, before a further reduction to NOK0.005 from 1 January 2021. The companies affected by this

ruling are: Altibox, Broadnet, eRate, Ice, NextGenTel, Orange, Puzzel, Telenor, Telia and Verizon.

(March 23, 2019) *telegeography.com*

The Netherlands' State Secretary for Economic Affairs Mona Keijzer has presented a bill to parliament which, if implemented, will allow the government to stop or even reverse takeovers of Dutch telecoms firms for reasons of national security or 'public order'. A report on SeekingAlpha notes that the development is likely to affect the chances of a proposed leveraged buyout of Dutch national telco KPN by Canada's Brookfield Asset Management, quoting a MainFirst analyst telling Bloomberg that such a bill being passed 'probably destroys hopes' of a foreign KPN buyout. The Brookfield recently entered preliminary talks with Dutch pension funds PGGM and APG Groep about partnering on a bid for KPN. Back in 2013 the telco's minority shareholder America Movil of Mexico failed in a hostile takeover bid after an independent foundation committed to the protection of KPN shareholders' interests stepped in to block it.

(March 6, 2019) *telegeography.com*

The Netherlands' Ministry of Economic Affairs & Climate Policy has issued a consultation on the government's plans to auction mobile broadband spectrum in the 3500MHz frequency range by a preliminary target date of 2021. Interested parties have until 17 March to submit comments. Concrete auction plans are expected to be announced by the end of this year, whilst consultation feedback will also be used in the government's upcoming mobile policy white paper. The 3.5GHz scheme requires freeing up the 5G-suitable band from military/intelligence usage in the north of the country.

(March 4, 2019) *telegeography.com*



New Zealand

The government has confirmed that it will renew most spectrum rights in the 1800MHz and 2100MHz bands from 2021, although some frequencies will be reassigned for 'other uses'. A statement issued by Kris Faafoi, the Minister of Broadcasting, Communications and Digital Media, noted: 'Spectrum is a limited resource and the rights to use spectrum in these two bands only come up for renewal every 20 years. When it comes to considering the next round of spectrum management rights, it's important we strike the right balance to ensure spectrum is used efficiently to benefit all New Zealanders.' In the 1800MHz band,

each of the incumbent mobile operators – Spark, Vodafone and 2degrees – have been offered renewal rights covering 40MHz of their existing 50MHz allocation. The 2100MHz spectrum held by Spark (30MHz) and Vodafone (50MHz) will be renewed in full, as will the 30MHz block held by Hautaki Limited, part of a charitable trust dedicated to boosting Maori participation in the ICT sector. Telstra's rights in the 2100MHz band are not currently being used and will not be renewed; the Australian firm sold its New Zealand unit to Vodafone in 2012.

(March 13, 2019) telegeography.com



Norway

Norwegian regulator Nkom announced plans to issue a new license for the 450 MHz band. The current license held by Ice expires at the end of this year, and the new license for 2x5 MHz will be valid from 01 January 2020 for 20 years. The new license will come with a coverage obligation of 30 percent of the country within five years. The license will carry an annual fee of NOK 6.51 million in 2019, plus sector fees. The frequencies will fall under the proposed overall spectrum cap of 2x35MHz below

1 GHz for each mobile operator. This comes ahead of the planned auction of the 700 MHz and 2.1 GHz bands. The cap will apply to the 450, 700, 800 and 900 MHz bands. Interested applicants for the 450 MHz license have until 26 April to contact Nkom. If there is only one applicant for the license, the Nkom will issue the spectrum for a fee of NOK 5 million. If there is more than one bidder, the regulator will consider holding an auction. (March 20, 2019) telecompaper.com



Philippines

Eliseo M Rio, Jr., the acting secretary of the Department of Information and Communications Technology (DICT), has said that as part of efforts to ensure the optimal use of precious radio frequency spectrum the government may look to redistribute frequencies to a fourth, or even a fifth, telecoms operator. Rio confirmed that currently, around 68% of allocated spectrum belongs to PLDT's Smart Communications (including Sun Cellular) or Globe Telecom, with the rest designated for the country's anointed New Major Player (NMP) – the Mindanao Islamic Telephone Company (Mislatel) consortium. However, any firms found to be using their allocations 'inefficiently' face the threat of revocation so that they can be redistributed to alternative operators. In December 2018 the DICT revealed plans to publish a new policy document by Q1 2019 allowing it to take back and redistribute mobile spectrum frequencies currently allocated to the country's incumbent operators. At the time the Philippine Competition Commission (PCC) also said that the regulatory reforms are necessary to ensure that the NMP is able to compete against the de

facto duopoly – PLDT and Globe Telecom.

(March 27, 2019) telegeography.com

The National Telecommunications Commission (NTC) has opted to postpone its planned migration to an eight-digit telephone number format, following an intervention from stakeholders of the local banking industry. Previously, the NTC had instructed domestic telcos to start implementing the migration by 18 March 2019 – subscribers of Globe Telecom have been told to add an identifier of '7', while PLDT Inc. users will have the identifier '8' – but GMA News reports that the delay pushes back the plan to 6 October 2019 at the earliest after banking stakeholders including the Bankers Association of the Philippines (BAP) and the Credit Card Association of the Philippines (CCAP) requested the delay. 'BAP and CCAP initially requested for deferment of the implementation to January 2020. Extensive consultations were conducted between the Commission, public telecommunications entities (PTEs), BAP, and CCAP,' a public statement confirmed.

(March 7, 2019) telegeography.com



Poland

Polish Minister of Digitisation Marek Zagorski, would prefer a contract tender to an auction for the award of 5G frequencies, reports Telko.in. The necessary preparations for the award of frequencies include a 5G implementation plan, a special act on the 700 MHz band and the amendment of the Act on support of broadband network development (so-called Mega Act).

The implementation plan for 5G is practically almost ready and will soon be adopted by the government in the form of a resolution, the minister told PAP. He said that the first 5G frequencies will be distributed in the 3.4-3.8 GHz band. Zagorski gave an assurance that the ministry is finalizing work on the document called the Strategy for 5G, because it is formally a

kind of implementation plan that will describe in detail the activities of telecoms operators and the administration, including regulator UKE. Soon it will be submitted to the Council of Ministers, and the ministry wants it to be adopted in the form of a resolution. Representatives of the operators are taking part in the work of the working team preparing the document. Zagorski thinks a putting a contract out to tender would allow the award of frequencies faster than an auction, but he said the decision depends on UKE. The refarming of the band 700 MHz, to be awarded for 5G, will be supported by adoption of a special act for that band. Besides, he pointed out the ongoing legislative work in the Parliament on the amendments of the so-called Mega Act and the Telecommunications Act, which will also affect investments related to the development of 5G technology in Poland. The proposed amendment stipulates, inter alia, that the permissible level of electromagnetic field (PEM) standards will

not be defined in the ordinance of the Minister of Environment but of the Minister of Health. Poland is one of few countries applying stricter non-radiation emissions limits, which could be one of the hurdles to implementing 5G networks. Similar strict limits apply in Switzerland.

(March 8, 2019) telecompaper.com

The Polish Senate has approved amendments to the country's Telecommunications Law relating to spectrum management, removing clauses relating to the refarming of the 700MHz (694MHz-790MHz) band for telecoms use. The band is currently used for digital terrestrial TV, but is earmarked for 4G/5G services. On 28 December 2018 Poland's government applied to the EC to delay its scheduled reallocation of 700MHz spectrum from June 2020 to June 2022, due to potential problems with coordinating the switchover with neighboring Russia. (March 1, 2019) telegeography.com



Spain

A royal decree has reportedly been signed in Spain, as the government seeks to kick-start the release of spectrum in the 5G-suitable 694MHz-790MHz ('700MHz') band. Officials wanted the Plan Tecnico Nacional de la Television Digital Terrestre (National Technical Plan of Digital Terrestrial Television) rubber-stamped before the pending dissolution of the government – which will take place ahead of the

general election on 29 April. The spectrum – referred to as the 'second digital dividend band' – is currently utilized for Digital Terrestrial Television (DTT) services but will be freed up by March 2020. Late last year officials revealed that the auction of 700MHz spectrum would now take place in early 2020, rather than in the first quarter of 2019, as previously suggested. (March 13, 2019) telegeography.com



Thailand

The National Broadcasting and Telecommunications Commission (NBTC) board has opted to postpone the planned 700MHz auction from May to August/September, as it needs more time to complete the auction procedures. Takorn Tantasith, secretary-general of the NBTC, said that the draft for the spectrum recall, the compensation procedure and the auction conditions is expected to go into effect in April, with all related conditions (including reserve price for the blocks) to be finalized by May. The 700MHz band is currently occupied by digital TV operators, which will be migrated to the 470MHz-510MHz band, thus freeing the 700MHz airwaves for 5G adoption in late 2020. The regulator will tender seven slots of 5MHz each, with 20-year validity. Winning bidders will have to pay the first instalment in the first year (20% of the winning price), with the remaining nine instalments (at 10% each) due from the third year onwards. (March 27, 2019) The Bangkok Post

Thailand's military-appointed parliament has passed a controversial cybersecurity law. The Cybersecurity Act, approved unanimously, raised protests from civil liberties advocates, internet companies and business groups, Reuters reports. Internet freedom activists have dubbed the new legislation as "cyber martial law", as it encompasses all procedures from

everyday encounters of slow internet connections to nationwide attacks on critical infrastructure. In case a cybersecurity situation reaches a critical level, the new law allows the military-led National Security Council to override all procedures with its own law. The law also allows the National Cybersecurity Committee (NCSC) to summon individuals for questioning and enter private property without court orders in case of actual or anticipated "serious cyber threats". An additional Cybersecurity Regulating Committee will have powers to access computer data and networks, make copies of information, and seize computers or any devices. Court warrants are not required for those actions in "emergency cases", and criminal penalties will be imposed for those who do not comply with orders. Legislators also unanimously passed the Personal Data Protection Act, intended to imitate the European Union's General Data Protection Regulation (GDPR). The legislation does not require international firms to store data locally. The data protection law, effective after a one-year transition period, will apply not only to companies located in Thailand, but also overseas companies which collect, use, or disclose personal data of subjects in Thailand, specifically for advertisements and "behavior monitoring". (March 1, 2019) telecompaper.com



Ukraine

The National Commission for State Regulation of Communications & Informatization (NCCIR/NKRZI) has submitted its plan to allocate frequencies in the 2300MHz-2345MHz band for 4G LTE mobile services to the State Special Services Committee, reports BizLiga. The spectrum is being released after revoking the

license of S-Line, a company associated with Russian businessman Yevgeniy Roitman. At its meeting of 12 March the NCCIR decided that new licenses will be issued via a tender, a target date for which has not yet been set.

(March 14, 2019) [telegeography.com](#)



United Kingdom

A group of more than 40 MPs from the All-Party Parliamentary Group on Rural Business (APPGRB) has written to UK telecoms regulator Ofcom to stress the need for annual monitoring of mobile network operators' (MNO's) commitments related to increasing rural 4G mobile coverage. While the cross-party group was 'initially pleased' by Ofcom's decision to implement coverage obligations for spectrum in the 700MHz that it to be sold in an upcoming auction, it now notes that it is 'greatly concerned' about how cellcos will be monitored. Specifically, the APPGRB pointed to the fact that there is no requirement for MNOs to report on successful mast completions until the end of the review process in 2024. APPGRB Chair Julian Sturdy said of the matter: 'While Ofcom's initial announcement truly has the potential to revolutionize mobile coverage across the countryside, it will fall by the wayside if progress is not monitored on a regular basis. We need annual reporting to ensure that mobile operators are holding their promises to the public on delivering a 4G network which works for people wherever they live.'

(March 12, 2019) [telegeography.com](#)

The regulator Ofcom has introduced new Code of Practice for Internet Service Providers (ISPs), under which customers buying broadband packages should be told how fast their new service will be, before they sign a contract. The Code of Practice has come into effect on 1 March 2019. The new code is part of Ofcom's work to promote Fairness for Customers, which ensures people get a fair deal from their providers. Under the

code, broadband firms will always be required to give customers a minimum guaranteed speed at the point of sale. In case the broadband speed of a customer drops below the promised level, companies will have one month to improve performance before allowing the customer exit, penalty-free. The right to exit is also applicable to landline and TV packages bought at the same time as broadband. ISPs will also be required to tell customers about what speeds to expect during peak times. Part of Ofcom's Fairness for Customers work, the new protections apply whether people are switching to a new provider or changing their current package. All major broadband firms – BT, EE, Plusnet, Sky, TalkTalk and Virgin Media – which together serve around 95% of home broadband customers, have signed up to the new code. Ofcom consumer group director Lindsey Fussell said: "When you sign a contract, you should be treated fairly and know exactly what you're getting. "These protections mean broadband shoppers can buy with confidence. Before they sign up, customers will be told their minimum internet speed. "And if companies break that promise, they'll have to sort it out quickly, or let the customer walk away." According to Ofcom's latest data, only three in 20 broadband customers contacted their provider proactively and renegotiated their deal in 2018. Furthermore, people with a basic, copper broadband connection have less than a one-in-five chance of being able to stream Netflix in ultra-high definition. Ofcom said that the initiative is aimed at helping people who want to boost their broadband, switch provider or just renegotiate what they pay.

(March 3, 2019) [governmentcomputing.com](#)



United States

The Federal Communications Commission's auction of 24 GHz spectrum has garnered more than \$1.409 billion in bids after eight business days and 23 rounds. That's double the \$704 million that the 28 GHz auction raised in its entirety. Three rounds of bidding are being held each day at this point in the auction. The clock auction format begins with a "clock phase" (the current auction phase) which lets participants bid on generic blocks in each Partial Economic Area in successive bidding rounds, followed by an "assignment phase" that allows the winners of the generic blocks to bid for frequency-specific license assignments. The clock phase continues, with prices automatically increasing each round, until bidders' demand for licenses at a

certain price matches the supply – and at that point, the bidders who have indicated they are willing to pay the final clock price for a license will be considered winners and the assignment phase can begin. The most hotly contested licenses are those covering New York City and Los Angeles, California. New York City metropolitan licenses are dominating the bidding: four bids for NYC licenses in the upper portion of the band are currently above \$30 million. One of those is at \$41.1 million, the largest bid of the auction thus far. The most expensive bid for a Los Angeles license, also in the upper portion of the band, is up to \$31.6 million, with other bids on LA licenses as high as \$28.7 million and \$26.1 million. Auction 102 offers up more than

2,900 licenses in the 24.25–24.45 and 24.75–25.25 GHz band. The licenses up for bid are based on a Partial Economic Area geographic basis which divides the country into 416 sections. Seven blocks of 100 megahertz will be available in nearly all of the licensed markets. The FCC noted in its auction information that the G block in some markets is completely or partially encumbered, so in a few PEAs in Arizona and Nevada, only six blocks are available. The lower segment of the 24 GHz band (24.25–24.45 GHz) will be licensed as two 100 megahertz blocks, according to the FCC, while the upper segment (24.75–25.25 GHz) will be split into five 100 megahertz blocks. Those licenses are indicated as categories L and U in the bidding round results. Thirty-eight bidders qualified to participate in the auction, including AT&T, T-Mobile US, Verizon and Sprint (bidding as ATI Sub LLC); U.S. Cellular; Dish Network, bidding as Crestone Wireless; Starry Spectrum Holdings and Windstream Communications, which recently filed for bankruptcy protection in the wake of a court case. The auction is proceeding in spite of bipartisan objections from several House members, NASA and the National Oceanic and Atmospheric Administration, which have expressed concern to the FCC that the agency is pushing ahead with 5G development that could potentially impact weather data collection operations in adjacent bands and hamper the nation's weather forecasting capabilities. The FCC is making a total of 1.55 gigahertz of spectrum available through auctions 101 (which concluded in late January after raising \$702 million) and 102. The agency plans to hold three more mmWave auctions during 2019, covering spectrum at 37 GHz, 39 GHz and 47 GHz. Although the FCC has usually makes winning bidders public shortly after the close of an auction, the winning bidders from Auction 101 will not be publicly named until after the close of Auction 102.

(March 25, 2019) rcrwireless.com

The Federal Communications Commission (FCC) initiated 'Auction 102' – its sale of Upper Microwave Flexible Use Service (UMFUS) licenses in the 24.25GHz–24.45GHz/24.75GHz–25.25GHz (24GHz) band – on 14 March, generating bids of USD304 million after one day of bidding. The 38 registered bidders include the likes of AT&T (bidding as AT&T Spectrum Frontiers), Verizon Wireless (bidding as Cellco Partnership), T-Mobile US, US Cellular and Windstream. An additional bidder, ATI Sub, is said to be an affiliate of Sprint Corp. Participants targeting the US territories of Guam and the Northern Marianas Islands, meanwhile, include DOCOMO Pacific and GTA (bidding as TeleGuam Holdings). By comparison, the FCC's auction of 28GHz spectrum ('Auction 101') – which took place between November 2018 and January 2019 – raised just USD41.7 million on its first day of bidding and generated a total of USD702.6 million. (March 18, 2019) telegeography.com

The FCC unanimously voted to adopt new rules related to the spectrum above 95 GHz that encourage the development of new technologies—and may even lead to 6G. Once thought to be more or less useless—similar to how much of the industry used to think of the millimeter wave spectrum that's now being deployed for 5G—these super-high spectrum bands are now viewed as offering opportunities for innovation, especially for data-intensive, high bandwidth applications as well as imaging and sensing operations. FCC Chairman Ajit Pai invited NYU Wireless Professor Ted Rappaport, who was instrumental in conducting ground-breaking millimeter wave research, to present his institution's findings thus far on the opportunities afforded by the spectrum bands above 95 GHz, where "science fiction will become reality," Rappaport told the commission. The applications that become possible at these higher frequencies are kind of mind-blowing, he said. With so much bandwidth and wider bandwidth channels, you can start having data rates that approach the bandwidth needed to provide wireless cognition, where the computations of the human brain at those data rates could actually be sent on the fly over wireless. As such, you could have drones or robotics receive in real time the kind of perception and cognition that the human brain could do. The conventional wisdom is that as you go higher in frequency, you get more loss. "That's only if you use an omnidirectional antenna, the old way of doing cellular 10 and 20 years ago. When you start using directional antennas, what happens is, you actually do better as you go higher in frequency for a given power level and a given antenna physical size," Rappaport said. To enable innovators and entrepreneurs to most readily access this spectrum, the FCC's Spectrum Horizons First Report and Order creates a new category of experimental licenses for use of frequencies between 95 GHz and 3 THz. These licenses will give innovators the flexibility to conduct experiments lasting up to 10 years, and to more easily market equipment during the experimental period, according to the FCC. "Today, we take big steps towards making productive use of this spectrum," Pai said in his statement. "We allocate a massive 21 gigahertz for unlicensed use and we create a new category of experimental licenses. This will give innovators strong incentives to develop new technologies using these airwaves while also protecting existing uses." Commissioner Jessica Rosenworcel said it's worth noting that the spectrum in these higher bands is different from the lower bands in that it's subject to the authority of both the FCC and the National Telecommunications and Information Administration (NTIA), and that requires more meaningful coordination among the federal partners. Fellow Democratic Commissioner Geoffrey Starks also noted that the terahertz spectrum imaging could change the way doctors and researchers understand biological processes on the cellular

level and doctors may be able to use the technology to conduct noninvasive cancer screening tests. In security settings, terahertz spectroscopy can be used to identify dangerous materials and weapons, meaning threats to safety can be identified without body scans. But he added that he has serious questions about the FCC Enforcement Bureau's tools to detect interference in these and other high-frequency bands. It's not currently capable of policing a significant amount of millimeter wave spectrum, which is being used for 5G, and he's concerned that without sufficient resources for modern enforcement tools, efforts will be undermined. While voting for the order, Commissioner Michael O'Rielly said the FCC's action on this spectrum in no way reduces the need for making more unlicensed allocations of spectrum and he pointed to two items in particular—revisiting the 5.9 GHz band and taking steps to open the 6 GHz band for unlicensed use—as ways the commission can address that. In a statement provided to FierceWireless, Rappaport said he was honored to be invited by Chairman Pai to be part of the historic vote to open up spectrum above 95 GHz for the first time in the history of the United States. "The vision and hard work by Chairman Pai, the commissioners, the FCC staff, and past work by Chairman Wheeler, have kept the U.S. on the cutting edge of 5G, ensuring that our country will enjoy the vast applications and efficiency it will provide," he said. "Now, with the Spectrum Horizons initiative and this historic vote, the FCC has launched the race to 6G, helping to ensure the U.S. will play a leading role in future generations of wireless." "President Trump mentioned 6G a few weeks ago - perhaps the first world leader to do so. As an engineer and educator, I'm happy to know our country's leaders are working to support American competitiveness in Science, Technology, Engineering, and Math (STEM)," Rappaport said. "STEM and engineering research are so vital for our country's economic future, and it needs attention like the President gave to 6G."

(March 16, 2019) fiercewireless.com

The FCC released the list of 38 qualified bidders for the 24 GHz auction, and that list includes AT&T, Verizon, T-Mobile and, listed as ATI Sub LLC, Sprint. Bluegrass Cellular, U.S. Cellular, Windstream Services and Starry are also among the qualified bidders. On the list of entities not qualified to bid (PDF), of which there are 22, are Cox Communications and Frontier Communications. The FCC didn't explain exactly why they didn't qualify, but entities needed to make timely and sufficient upfront payments in order to qualify. Licenses in the 28 GHz auction were based on counties, while the 24 GHz licenses in Auction 102 are based on Partial Economic Areas (PEAs). The nation's big mobile operators tend to like PEAs rather than counties due to their economics. Specifically, the lower segment of the 24 GHz band (24.25–24.45 GHz) will be licensed as two 100-megahertz blocks, while the upper segment (24.75–25.25 GHz) will be licensed as five 100-megahertz blocks, with four 100-megahertz blocks and one 75-megahertz block offered in one PEA and only four blocks in three other PEAs. A mock auction will be held March 8. The 28 GHz auction, dubbed Auction 101, ended in January after more than two months of bidding that generated a total of \$702,572,410 in provisionally winning bids. That auction had 40 qualified bidders. The FCC still has not disclosed the winning bidders of Auction 101; that will happen after Auction 102 closes. With the 28 and 24 GHz auctions, combined with a single auction later this year for the upper 37 GHz, 39 GHz and 47 GHz spectrum bands, the U.S. is seeing a remarkable amount of millimeter spectrum up for grabs. Combined with the 28 and 24 GHz auction, all of the millimeter wave auctions will free up more spectrum than is currently used to provide terrestrial mobile broadband by all providers combined. But many operators say they need midband spectrum to remain competitive in 5G, and that remains elusive.

(March 7, 2019) fiercewireless.com



Zimbabwe

The government is hoping to raise USD350 million from the sale of shares in five state-backed companies, including three telecoms operators. The African country, which is currently experiencing a severe cash crisis, plans to sell stakes in cellcos NetOne and Telecel, plus fixed line operator TelOne, as well as interests in postal operator Zimpost and POSB bank. Reuters

cites Finance Minister Mthuli Ncube as saying: 'Work is already underway to identify transaction advisers.' TeleGeography's GlobalComms Database notes that NetOne and TelOne are both wholly state-owned, while the government has a 60% interest in Telecel. 🇸🇰

(March 20, 2019) telegeography.com

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