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# SAMENA TRENDS

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## BUILDING DIGITAL ECONOMIES



VISION رؤية
2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

CITC – KSA Steering the Market toward Fulfilling Vision 2030 through Highest Spectrum Availability...

etisalat

*Featured*

## Eng. Saleh Abdullah Al Abdooli
Chief Executive Officer
Etisalat Group

THIS MONTH

# eSIMs IN HANDSETS – THE NEXT BIG DISRUPTION

# MWC19

BARCELONA 25-28 FEBRUARY

## Building a Fully Connected, Intelligent World

HUAWEI

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**FEATURED**

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# eSIMs in Handsets - The Next Big Disruption

Embedded Subscriber Identity Modules (eSIMs) hold a great promise on some accounts, especially when convenience of switching to a local network comes to mind. Being a programmable chip, an eSIM cannot be removed from the phone or needs to be replaced, and thus is not prone to being damaged. Any device with an eSIM will be ready to use once it is turned on and activated on a network. Only the user profile is managed and transmitted to any network to gain access to cellular services in both home markets and abroad. However, as more and more smartphones and smartwatches with eSIMs are coming to the market, network providers in a select few markets where eSIMs are allowed to operator currently, have problems integrating the devices into the networks. The problems occur mostly if eSIM and profile are not from one and the same manufacturer. Moreover, the interoperability issues also arise due to different interpretations by eSIM developers and telecom operator-specific use and business cases, which can rarely be covered by any specifications or standard.

The rise of the eSIM is really linked to the machine to machine (M2M) communications concept, which has gained pace and increasingly we see all kinds of devices being connected to telecom networks, ranging from wearables to automobiles, from drones to refrigerators. Moreover, the limitations and the inconvenience in having to change and procure new traditional SIMs have far too long been a subject of inner discussions within the industry.

From among SAMENA Council members, besides Apple, AT&T, Etisalat, several other technology providers and telecom operators are exploring how eSIMs could add value to customers' (whether humans' or machines') digital experience and to operator's business. The embedded SIMs solve various problems associated with SIMs, but it is yet to be found out if and how new opportunities for operators could be created from eSIMs. From operators' point of view, dealing with the logistics of handling millions of SIM cards could be one area of opportunity, since, with the availability of eSIMs, operators can develop truly digital experiences for their subscribers, while reducing the burden on their supply chain and gaining customer loyalty.

Furthermore, as 5G development accelerates, with fifth-gen connectivity ready to dramatically alter mobile services, embedded SIMs could play an important role in the digital experience arena. One thing is clear that devices in the 5G and IoT ages will have very robust processing power, and they will need to rely on embedded SIMs.

The case for eSIMs is thus closely linked to 5G and IoT use-cases much more so than it is currently for users of SIMs. We have to delve into this subject further in the SAMENA region and assess its various positive features as well as policy and privacy issues.



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

# Saudi Arabia Takes Lead in 5G Spectrum Availability

CITC Steers the Kingdom's ICT Market in Becoming among the Fewest Markets with Most Spectrum Available





Saudi Arabia, over the recent years, has demonstrated a strong will to leverage ICTs to facilitate broader sustainable economic growth. Substantial evidence shows that the Saudi government, through the Ministry of Communication and Information Technology (MCIT) and the Communication & Information Technology Commission (CITC), along with Saudi Telecom Company at the forefront of communications infrastructure development in the Kingdom, have done much to make connectivity ubiquitous; to raise efficiency levels of services' infrastructure, welcome new competition, and

to develop human capacity. As a result, the Kingdom has become home to one of the most liberalized telecoms markets within the SAMENA region. Newest developments in the Saudi market with respect to making more spectrum available to telecom operators further, and more vividly, show that the Middle East's largest economy has also taken lead on making 5G a priority.

According to the CITC, in a presentation given at a December ITU Workshop in Riyadh, the amount of spectrum available can indeed make a big difference to data rates on mobile. For example, from September 2017 September 2018, average download speeds in Saudi Arabia increased from 9.3 Mbps to 26.3 Mbps. This almost tripling of the data speeds for consumers appears to have a lot to do with the three spectrum awards that have happened in the Kingdom since June 2017.

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Without an iota of doubt, massive increase in the amount of harmonised spectrum made available by the CITC to the local operators has become a true game-changer in the Kingdom as well as in its neighbourhood. Before June 2017, the amount of spectrum available to the mobile networks was 260 MHz, which placed KSA amongst the tail-end of MENA markets. But the CITC has carried through exceptionally well what the Saudi Vision 2030 had called for – that is, supplying a lot more spectrum. Saudi CITC did this with spectrum auctions in June 2017, February 2018, January 2019, with one additional auction expected in first quarter2019. By

**By the fourth spectrum award expected after the end of Mobile World Congress 2019, Saudi Arabia, according to analysis, will have made available 1,010 MHz of spectrum, which will place the Kingdom at the top spot for spectrum availability in the region (and a lot of other places, globally).**

any standards, this is a very quick turn around in spectrum allocation practices and is having its effect on the Saudi market. Needless it is to say, this spectrum availability sets a benchmark for other markets to follow.

By the end of January this year, spectrum available in Saudi Arabia stood at 710 MHz, putting the Kingdom in the top three markets. By the fourth spectrum award expected after the end of Mobile World Congress 2019, Saudi Arabia, according to analysis, will have made available 1,010 MHz of spectrum, which will place the Kingdom at the top spot for spectrum availability in the region (and a lot of other places, globally).

The Commission appears to be making every possible effort to pave the path for 5G, by consulting with industry stakeholders, and allowing trial networks – to help operators get to grips with complex new technologies (Massive MIMO, etc) and to envision 5G use cases. The CITC has also tried to promote competition in the market by allowing a fourth operator –– to participate in the mobile spectrum auction held in June 2017. Unfortunately, this could not materialize as the prospective competitor was unable to pay for the acquired spectrum, which was quickly re-auctioned in February 2018.

The importance of spectrum availability cannot be overstated anywhere, much less in Saudi Arabia. While mobile operators could try and get around having less spectrum, the law of diminishing returns, especially in the wake of 5G preparations, would have come into force: the harder scarce spectrum resources are squeezed, the more expensive it becomes to use the spectrum. Without spectrum operators need more and more radio sites, which are expensive to build and commission, adding to an already complex capex situation operators have highlighted over the years. Not only that, the closer and closer sites get, the more and more their signal transmissions interfere with each other, thus reducing capacity gains. It is simply a much better and logical approach to make more spectrum available in bigger markets such as Saudi Arabia.

And this is precisely what the CITC has done, successfully.

However, is the anticipated upcoming award the last one that the CITC will make for a while? Not necessarily.

Saudi Arabia, along with many other countries, is monitoring what will be needed in the future – and the future is millimetre waves (26 GHz). The US has just auctioned its version of millimetre spectrum for 5G.



**Commercial Mobile Spectrum (MHz) Availability in the Region**

| Country | Value |
|---|---|
| Saudi Arabia | 1,010.0 |
| Bahrain** | 720.0 |
| UAE* | 700.0 |
| Morocco *** | 625.0 |
| Kuwait | 528.8 |
| Oman | 480.0 |
| Sudan | 358.4 |
| Jordan | 330.0 |
| Egypt*** | 320.0 |
| Lebanon | 310.0 |
| Tunisia | 220.0 |
| South Sudan | 210.0 |
| Iraq | 189.0 |
| Algeria *** | 120.0 |
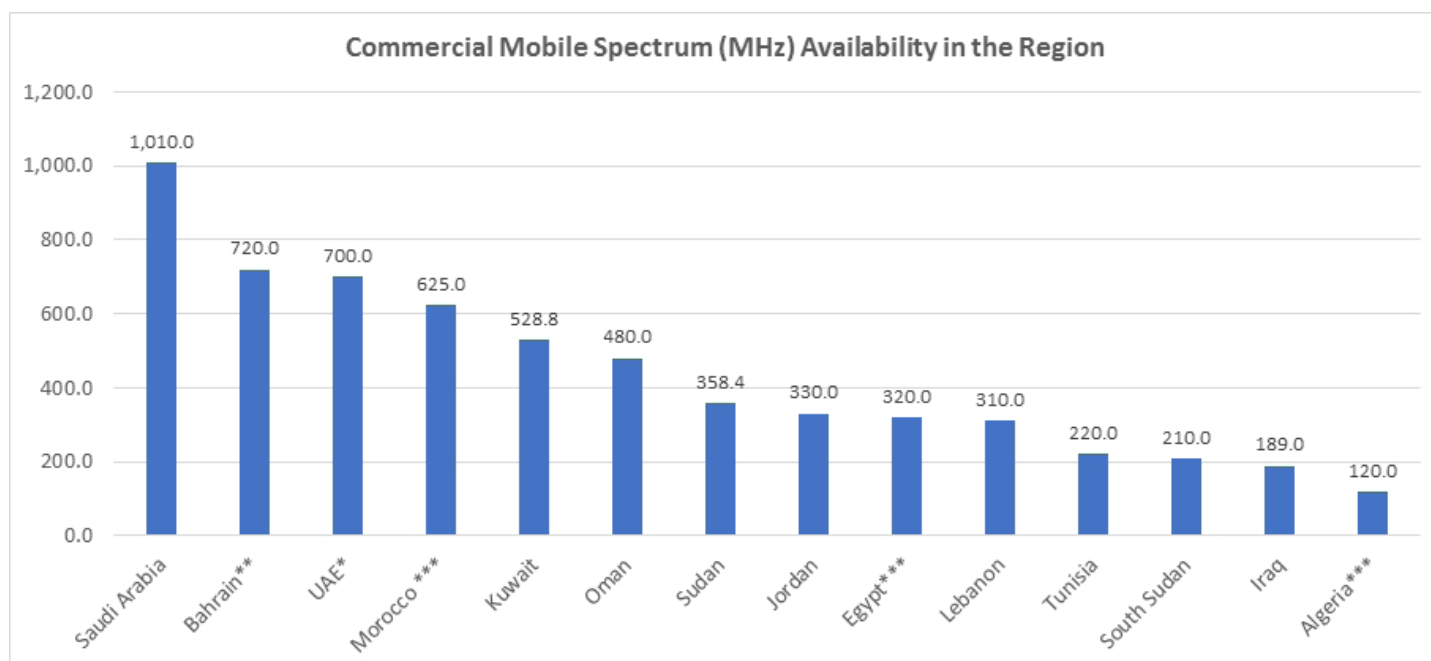
*** Source: Policy Tracker          ** including 800 and 2.6 bands under consultation          * assumes 3.6-3.8 available if needed.

The next World Radiocommunication Conference, WRC-19, in Egypt will decide on the new super -high frequency mm waves in November 2019, which would pave the way forward for a lot more mobile spectrum to be awarded in the region.

The CITC is also considering the future of the rest of the C band (3.8 to 4.2 GHz); to follow through with what is expected to be auctioned this quarter. The Commission has openly expressed its willingness to remain open to licensing this band, but that depends on market demand as well as successful sharing arrangements. The CITC plans to delve into this issue in 2020. Other potential bands are the 1500 MHz band. But, for the time being, the CITC anticipates that the spectrum releases so far should satisfy market demand for spectrum. The Saudi regulator believes this 1010 MHz of spectrum will keep operators busy for a while, and anticipates that for operators to fully deploy the newly acquired spectrum in their networks, two to three years will be required.

So, is there anything else that the CITC is doing to help fulfil the Kingdom's 2030 Vision, provide operators what they need, and steer through complex digital transformation trends throughout the region and the world?

The perennial issue of cross-border radio interference is always around. The situation is especially complex in the GCC region, with short distances between urban centres in different countries and different wireless technologies utilised across borders. If such issues are not addressed, then consumers in border areas could have some limitations on their 5G services. To this effect, the CITC has been active in the past with the Kingdom's neighbours to ensure common band plans as well as technical arrangements to alleviate interference. This is paramount to Saudi Arabia's digital transformation needs.

Transforming Saudi Arabia into a knowledge economy is a process that the leadership of the CITC is streamlining and fortifying in accordance with the spirit of national transformation plan and Vision 2030, which addresses policy needs from socio-economic perspectives and provides a long-term direction in which the government of Saudi Arabia wants to steer the country. In a country where both the population and the economy have expanded enormously over the years, combined with the national imperative of reducing reliance on mined natural resources, digital development and digitization are the best, if not the only, way forward. Addressing cross-border interference, as the Kingdom prepares for 5G launch, will be highly important.

Given the pace at which the CITC has delivered outstanding results on spectrum availability, it can be anticipated that the Saudi regulator will continue working to develop the bi- and multi-lateral agreements necessary to allow the unimpeded deployment of 5G all over the Kingdom.



*Roberto Ercole and Izhar Ahmad contributed to this writing from SAMENA Telecommunications Council.*

# Etisalat Sets New Benchmark as the First Middle East Brand Portfolio to Break US$10bn Barrier



**Eng. Saleh Abdullah Al Abdooli**
Chief Executive Officer
Etisalat Group

**5G a reality for the next generation**

Early in 2018, Etisalat set global benchmarks in 5G in technology and on the network. Etisalat successfully conducted a 5G trial with outdoor mobility. The trial demonstrated 5G capabilities in a real world environment over a live network, including tests on speed, latency and beam steering. The 5G trial system used 800MHz of spectrum in the 15GHz band, demonstrated over 20 times greater performance than what was currently used in 4G networks. The trial also achieved an aggregate site throughput of more than 24Gbps a significant improvement over current 4G networks.

Another major milestone for Etisalat and the telecom industry was the launch of the first commercial 5G wireless network in the UAE becoming the first telecom operator in the Middle East and North Africa (MENA) region to achieve this technological milestone and set an industry benchmark. Etisalat was the first operator to have a fully developed commercial 5G network available to provide gigabit internet services to its customers. The network will fuel enterprises digital transformation, IoT, smart cities and the fourth industrial revolution.

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Etisalat's network will provide the most advanced digital and telecom services to Expo 2020 Dubai and its millions of visitors, supporting an expected 300,000 users on peak days. It will be a key component of the Expo 2020 'smart site', that will deliver a unique and memorable experience for the millions of visitors.

**5G-Ready-Set-Go**
Etisalat is now ready to launch 5G service for all consumers with its infrastructure and network equipped to support all 5G devices set to be launched by global mobile device manufacturers in 2019. With continuous investments in technology and innovation on the network, Etisalat's infrastructure can enable 5G connectivity today for all fixed devices expected to be launched in the first half of this year.

Etisalat's technical teams are building 5G network sites to enable 5G coverage across the country. Our network and infrastructure will be ready to provide the service as soon as the 5G mobile handsets are available in UAE. With 5G technology consumers will witness unprecedented maximum speeds of 10Gbps.

With majority of 5G deployments to be implemented by 2020 on a global level, by the end of 2024 industry estimates indicate a projection of 1.5 billion 5G subscriptions accounting to 17 percent of all mobile subscriptions at that time. Etisalat foresees the future of connectivity and is already exploring use cases with new technologies and services that will blend our physical and digital world.

**Journey and achievements in 5G**
5G is becoming a reality in UAE, Etisalat's pioneering efforts in 5G will enable subscribers to enjoy technologies blending physical and digital realms from AR & VR to IoT, AI, autonomous vehicles, advanced robotics, 3D printing, wearable tech and more.

Our continuous investments and focus on enhancing and building one of the most advanced networks in the region have empowered digital transformation opening up opportunities to engage with our customers in new ways. Innovation was always at the core of our strategy to 'Drive the digital future to empower societies' putting our efforts on providing innovative solutions enabling connectivity, mobility, connected devices and IoT, energy efficiency, lower latencies and more reliability.

Etisalat embarked on its 5G journey four years ago when it started construction of the network with a dedicated team of engineers and specialists to build one of the most advanced networks in the region. In the same year, a number of strategic partnerships were signed with global technology companies to carry out trials and implement advanced technologies and solutions on the network. A series of tests were carried out in the infrastructure to gauge the extent of 5G readiness and get an insight into the upgrades required to launch the 5G network first in the region. The goal was to get the network ready for data heavy applications and content to be broadcasted across media platforms during the Expo 2020.

Another significant milestone in 2016 was the successful completion of the first live 5G experiment using millimeter waves (mmWave). This showcase was the first of its kind in the MENA region with Etisalat becoming the first telco globally to test speed at 36 Gbps on a 5G network. This was followed with another global milestone in 2017 with a speed showcase of 71Gbps setting a new global record in data transfer speed using e-band and massive MIMO technology.

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**Strong outlook and company performance**
Etisalat continued to deliver on its promise of strong performance despite the increasing global economic challenges and the mounting pressure facing the telecom industry. We have showcased good results underpinned by our continued commitment and investments toward next-generation services and solutions, adding remarkable value to the communities we serve and enhancing customer experience.

> **We will continue to focus on creating the world's best and leading networks across our markets to deliver long-term value to all our stakeholders.**

Our corporate strategy have enabled us to consistently push boundaries, by responding swiftly to the global digital advancements and proactively delivering cutting-edge services and solutions to our customers. We will continue to focus on creating the world's best and leading networks across our markets to deliver long-term value to all our stakeholders.

Etisalat Group is confidently moving forward in enriching lives and enabling societies across it markets. As a group, we will continue our efforts to sustain a healthy portfolio that maximizes synergies, and focuses on enhancing customer experience.

**Synergy among our operations**
Etisalat efforts across its operating companies has helped solidify our position with our superior network, strong core business and new revenue streams.

With an international footprint that extends across Asia, the Middle East and Africa, Etisalat Group operates in a wide array of macro-economic contexts. Whilst the group anticipates market fluctuations and changes in certain markets, we expect to transform business and operating models with our dynamic and adaptable corporate strategy in order to thrive these varying contexts.

The successful launch of 4G services in Egypt was a testimony to our efforts and a key milestone in the country, as it served as a catalyst for economic growth and deliver benefits to the entire society. Additionally with the deployment of VoLTE in 2018, Etisalat Misr has continuously played a significant role in the development of Egypt's telecom sector. In Saudi Arabia, Mobily's strategic vision under the Saudi Vision 2030 saw investments and partnerships to develop 5G and bolster the advanced network in the country.

Etisalat will focus on 'Driving the digital future to empower societies' to explore the future of connectivity as it fuels new technologies and services that will blend our different maturity levels in each market.

**Etisalat at Mobile World Congress 2019-Overview**
We are stepping into an era, which marks the beginning of 'Intelligent Connectivity' underpinned by ubiquitous and hyper connectivity. This term is used to describe the powerful combination of flexible, high-speed 5G networks, the Internet of Things (IoT) and Artificial Intelligence (AI). This will have a significant and profound change on individuals, industries, society and the economy, transforming how we live and work.

> **Etisalat Group is at the heart of this evolution by taking great strides in the rollout of 5G networks. The focus at MWC this year will be engaging in discussions in the future of the network and at the same time expecting healthy debate on the new challenges and opportunities presented by the next generation of Technologies.**

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**Leading the way to the future**
Innovation and digital transformation are key to our success and a result of our strategy and vision at the next level of development that has led the company to play a greater role in the digital lives of consumers and enterprises. This forms the backbone of a robust and one of the most advanced, fastest and widest network in the region.

Infrastructure investments have been key to this growth and leadership in the market, this continuous investment have led to the modernization of mobile and fiber-optic networks and infrastructure development through investments in future technologies such as IoT, AI and 5G.

Our robust network is a pillar in our long-term digital strategy that has helped in maintaining consistent leadership globally in setting benchmarks in the telecom industry. For instance, the UAE remains a global leader in terms of FTTH penetration, this enabled us to launch of innovative services meeting the growing demand and changing requirements of our customers. At the same time, Etisalat's 3G and 4G network coverage has set a benchmark by reaching 99.73 percent and 98.95 percent respectively.

Etisalat also recently was recognised as the ' The Most Valuable Portfolio Brand' in Middle East and North Africa (MENA) by Brand Finance for the 3rd year in a raw , as a recognition for the company's impressive portfolio of brands becoming the first Middle East group to break the US$10 billion barrier in terms of wider portfolio value.

Today Etisalat boasts of a portfolio of brands such as Etisalat Misr, Mobily, Ufone, Maroc Telecom, PTCL and Etisalat Afghanistan. The company has also seen an 8 percent growth since last year, resulting in becoming the first Middle Eastern brand to hold such a wide portfolio. For the second consecutive year, Etisalat also retained its position as the most valuable consumer brand in the Middle East and Africa.

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Operating in 15 countries across Asia, Middle East and Africa, Etisalat's success can also be attributed to its continued efforts in developing its customer loyalty programmes, sports sponsorship commitments and in driving the digital future to empower societies.

Several factors have attributed to the success and growth of Etisalat's brand value mainly driven by an innovative customer service driven strategy, adapting well to a digital savvy marketplace, leading the 5G revolution and the successful launch of global brand building initiatives. Etisalat has reached out and engaged with its consumers across markets with global branding initiatives by sponsoring global football teams and clubs aligning with the brand's priorities of being at the forefront of major sporting events. Etisalat also launched the new positioning campaign 'Together Matters' to highlight togetherness among its subscribers in today's world of connectivity.

**Fostering innovation and entrepreneurship**
Etisalat has always believed in the power of creativity long-term value and success by fostering the growth of tommorow's innovators and entrepreneurs. We are constantly looking to tap into the possibilities of the booming startup ecosystem. Etisalat is looking at nurturing entrepreneurial growth by creating partnerships that will provide them the platform to grow and showcase their abilities.

We were able to work together with these young innovators and entrepreneurs to imagine, design and co-create the future. Our teams focused on solving complex challenges while leveraging assets to create unparalled opportunities. With the accelerator whose mission is to play a pivotal role in shaping the future of strategic sectors in the region, Etisalat worked with government entities and scaleups to co-create solutions to address both the local and global challenges of the future. This partnership was part of Etisalat Digital's strategy to bring the latest technologies and innovations to enable a smart ecosystem.

Etisalat has also collaborated with the open innovation ecosystem with its own innovation programme 'Future Now' that focused on introducing new ways of collaborating with startups, IoT developers, government entities, enterprises and end-users. Young companies will get a platform to engage with experts, have access to Etisalat's robust network and use digital technologies to build viable products and create new revenue streams.
The ultramodern 'Open Innovation Centre' provided a platform to showcase these digital technologies and was in line with the overall strategy to empower the society' across our customers and enabling them with solutions and services on this digital journey. Businesses had the opportunity to experience Etisalat solutions applied in real-world scenarios and get a comprehensive view of technologies that deliver concrete business outcomes.

Our Digitisation efforts are not limited to business products and services but also in providing a digital experience for our customers. Customer experience has seen revolutionary changes using innovative digital platforms to interact and enhance the overall engagement while continually

creating new innovative products and offerings to meet their changing needs and requirements.

For instance, Etisalat implemented advanced systems for in-depth analysis and Customer Feedback Management modules implemented across all touchpoints to collect on-the-spot feedback on customer interactions

Another example is speech analytics utilising next-generation tools and systems to analyse voice-based communications aiming at enhancing service quality and derive actionable insights to fulfill the needs and expectations of our customers better and ensure a seamless experience.

With our portfolio of services for enterprise solutions, Etisalat offers a wide range of integrated services, from office connectivity to networking solutions. Etisalat has tailored solutions for the SMB sector to deliver the best possible value and a competitive offering. We have set up a first dedicated business hub for SMBs

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that is committed to provide owners with tailored advanced solutions that increase their productivity and profitability.

## SAMENA COUNCIL ACTIVITY

# SES Networks Enhances Satellite Service Providers' Presence Within the SAMENA Council Membership

**SES Networks**

SAMENA Telecommunications Council has announced that SES Networks, with its extensive geostationary and non-geostationary satellite broadband service footprint around the world, has joined leading telecom operators as a member of the SAMENA Council.

With the market's only non-geostationary satellite broadband constellation O3b MEO, the largest fleet of geostationary satellites and extensive ground infrastructure, SES delivers reliable, high-performance communications solutions to the world's hardest-to-reach places. SES Networks provides managed data services to telcos

and ISPs, mobile network operators, cloud solution providers, in-flight connectivity providers and maritime fleets, energy companies, and government agencies. The satellite operator's end-to-end managed solutions allow organizations to rapidly deploy and scale networks and services for the cloud era.

With its established and industry-recognized aim of bridging telecoms ecosystem priorities, including on sustainable investment and highlighting digital transformation needs of the region, SAMENA Council actively advocates on behalf of its operator members and works closely with private-sector stakeholders, including SES and other satellite service providers. SAMENA Council advocates for resolutions and

highlights among government and private-sector stakeholders' issues, such as those relating to spectrum, need for accelerated digitization and sustainable digital development through collaboration, among others, which are common to both terrestrial and satellite operators.

New members, including telcos, MNOs, satellite operators, and technology vendors 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 public and private-sector leadership, while working towards addressing digital development matters through collaborated positions on industry issues, remedying which would positively impact the future of the digital communications industry.

## MEMBERS NEWS

# STC Reports an 8% Increase in Net Profit to SAR11Bn in 2018
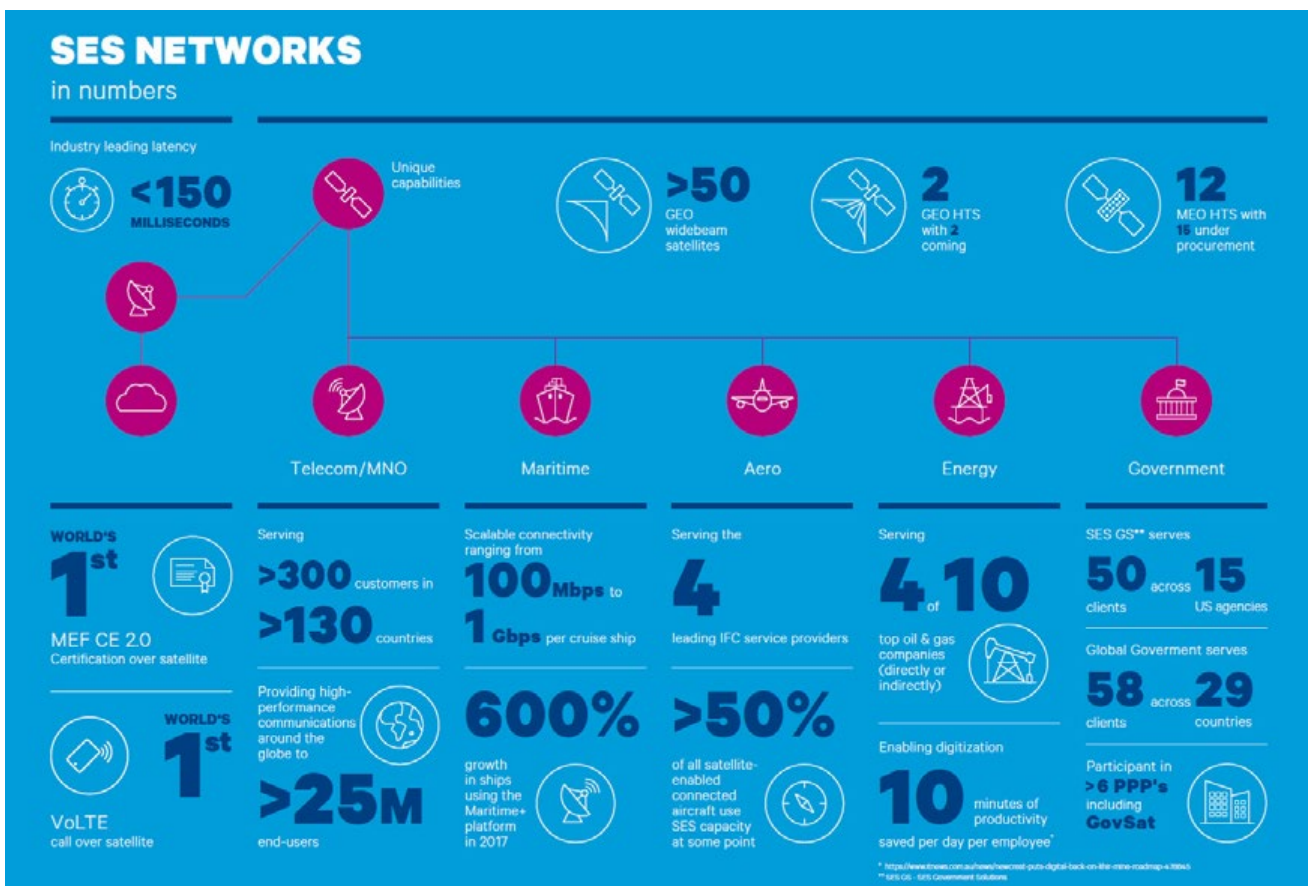
Saudi Telecom Company (STC) has published its financial results for the twelve months ended 31 December 2018, reporting a 7.7% increase in net profit to SAR10.790 billion (USD2.87 billion) from SAR10.016 billion in the corresponding period a year earlier. The company attributed the positive result to a SAR664 million increase in revenues and a SAR579 million decline in cost of revenues relating to the amendment of the mechanism for calculating service provisioning fees, which

resulted in a SAR1.303 billion increase in gross profit. In the period under review, STC reported a 2.7% Improvement in revenues to SAR52.068 billion, while EBITDA reached SAR19.857 billion, up 7.7% from SAR18.431 billion. In operational terms, STC disclosed that the number of its fiber-to-the-home (FTTH) customers increased by 18% year-on-year compared to 2017, to reach around 600,000 subscribers.

# STC Wins Award of "Saudi Arabia's Fastest Mobile Network"

OOKLA, The Global Internet Broadband Speed Test Company has awarded STC the valuable and inspiring "Fastest Mobile Network" in KSA award. STC achieved a speed score of 29.99 Mbps, with average download speeds of 32.95 Mbps. This is the outcome from Millions of tests which are actively initiated by consumers daily across the network to test the Internet speeds using various applications and platforms. The Speed test Awards for top providers are determined using a Speed Score that incorporates a measure of each providers network speeds to rank network speed performance. STC network was, by far, the fastest in KSA. Needless to mention

that STC currently has "Daring" plans to increase this speed dramatically in the next couple of years to provide impressive speeds and incorporate future services with KPIs targeting higher data rates, very low latency, massive device connectivity, IoT and energy efficiency services, etc. To achieve this, STC is transforming its existing network, upgrading its 4G-LTE network and rolling out the phenomenally fast 5G network. Eng. Haithem Al Faraj, Senior VP, Tech & Ops, STC, said: "Our mission has always been to enrich society by providing second-to-none experience with the network. We are continuously improving our network speeds and

rolling out new network technologies and services. STC 4G network is transforming all the time to provide remarkably faster speeds. We are also commercially rolling out the 5G network to introduce innovative services to our deserving customers in the Kingdom of Saudi Arabia, and across the region. This OOKLA esteemed Award is a true manifestation of STC efforts to continually improve the network and get the network ready for the total digitization transformation Era, and to meet the KSA National 2030 Vision. We are very proud of this award and look forward to many similar awards and successes in the near future."

# STCS Launches First iDirect DVB-S2X Network in Middle East

VT iDirect, a company of VT Systems, announced that STC Solutions Saudi Telecom Company (STCS), the leader of Information Communications Technologies (ICT) in the Kingdom of Saudi Arabia (KSA), will launch the first iDirect DVB-S2X network in the Middle East. Utilizing VT iDirect's iQ Series of remotes, its next-generation DVB-S2X technology will enable STCS to offer high-speed connectivity and expand its service

offerings to meet the needs of high-bandwidth applications cost-effectively and efficiently. The technological move is in alignment with the digital transformation strategy that the KSA plans to realize by 2030. The iQ Desktop remotes are designed to serve a wide range of performance scenarios and service providers can add new features on demand, based on a future-proof software-upgradeable design. This will benefit STCS's clients

across the KSA, such as users from the Government ICT and enterprises, and enhance cellular backhaul. "Launching the first iDirect DVB-S2X network in the Middle East gives us a clear sales advantage and enables STCS to meet escalating demands for bandwidth from customers," said Yasser Z. Alotaibi, Vice President of Connectivity Services, STCS. "We chose VT iDirect's next-generation DVB-S2X platform for its ability to allow us to scale

as we grow and offer our customers the best technology in the market today." "We are pleased to be a preferred technology partner to service providers like STCS, empowering them to offer their customers the best possible network experience," said John Arnold, Vice President, Global Sales, VT iDirect. "Our DVB-S2X platform is built to deliver now and well into the future, and will enable STCS to keep pace with customer demand." STCS is committed to continuous improvement for our customers and embracing the future now. A wholly-owned subsidiary of the STC Group, we are the leading ICT services and solutions provider in KSA with over 1,000 employees serving customers from 35 cities within

the Kingdom. We share a future vision with our customers – where the needs of society, the enhancement of education, the attainment of better citizen and customer outcomes, and safer, securer and smarter environments are not just a long term aspiration; they are achievable now. For STCS achievement thrives on finding better ways of doing things for our customers. This is the true spirit of innovation. VT iDirect, a subsidiary of VT Systems, is a global leader in IP-based satellite communications providing technology and solutions that enable our partners worldwide to optimize their networks, differentiate their services and profitably expand their businesses. For more than

20 years, the VT iDirect organization has focused on meeting the economic and technology challenges across the satellite industry. Today, the product portfolio, branded under the name iDirect, sets new standards in performance and efficiency, making it possible to deliver voice, video and data connectivity anywhere in the world. VT iDirect is the world's largest TDMA enterprise VSAT manufacturer and is the leader in key industries including mobility, military/government and cellular backhaul. In 2007, iDirect Government was formed to better serve the U.S. government and defense communities.



# STC Announces New Appointments of a Number of Saudi Senior Executives

Saudi Telecom Company (STC) has announced new appointments of a number of Saudi senior executives,



including the appointment of Eng. Haithem Bin Mohammed Al Faraj as Senior VP - Technology & Operations, Eng. Alayan

Bin Mohammed Al Wateed as Senior VP - Customer Unit, Eng. Badr Bin Abdullah Al Lahib as VP - Operation Sector in the Technology and Operations Unit, Eng. Abdullah Bin Mohsen Al Owaini as VP - Applications sector in the Technology and Operations Unit and Eng. Riyad Bin Hamdan Al Enzi as VP - Customer Care sector in the Customer Unit. STC CEO, Eng. Nasser Bin Suleiman Al Nasser explained that STC is committed to empowering Saudi cadres based on their qualifications and expertise and to appointing young Saudi qualified employees in leadership positions, in order to enhance the performance of the STC Group in line with its pivotal role in enabling the digital transformation in the Kingdom to the public and private sectors in accordance with Vision 2030. Al Nasser continues: "This also comes in line with STC "Dare" strategy to lead the transformation and development in new paths, especially with the rapid changes in the global ICT sector".

# Batelco, Cisco Meraki in Managed Wi-Fi Deal

Batelco, the leading digital solutions provider in the Kingdom, has partnered with Cisco Meraki to provide Batelco's small and medium enterprise customers with a managed comprehensive WiFi solution. The smart managed WiFi solution based on the Cisco Meraki Access Point extends to enterprise customers various features, including a wide range of high speed WiFi and strong coverage, Zero Touch Provisioning (ZTP) technology, Location Analytics, business grade firewall, bandwidth control, multi-SSID Support, and application control. Furthermore, the solution includes a customized landing page and WiFi monetization feature for businesses who wish to offer a personalized and customized WiFi experience for their customers and generate revenue from their Wi-Fi networks. Enterprise smart managed WiFi is offered as a managed service that is 100% supported and controlled by Batelco eliminating the need for enterprises to employ technical support staff and relieving them of some overhead and operating expenses. The solution however does include a subscriber portal from which customers are able to view usage

reports and statistics and additionally operate and manage the device, should it be needed. Batelco Bahrain Chief Marketing Officer Abderrahmane Mounir highlighted Batelco's focus to create a dynamic ecosystem that aims to create a digital community linked to an integrated communication system, and the company's keenness to provide smart technology solutions to support entrepreneurs in the advancement of their businesses. "Batelco is continuously developing its portfolio of solutions to support the growing demand

for advanced communications solutions applicable for all sectors, especially small to medium enterprises," commented Mr. Mounir. Batelco's efforts are focused on supporting the Kingdom's Economic Vision 2030, by developing and providing advanced solutions to support growth and innovation in the Kingdom. Batelco also seeks to strengthen its collaborations with global companies in order to provide the highest quality of services in the Kingdom and the adoption of the latest technologies and solutions.



# du Joins CBSG Consortium for Blockchain Innovations

du, part of Emirates Integrated Telecommunications Company (EITC), is set to work alongside some of the world's leading multinational telecommunications firms, as a member of the Carrier Blockchain Study Group (CBSG) – a global consortium of leading telecommunications companies building the next-generation of blockchain technology and innovations. In joining the CBSG, du will become a key part of the first worldwide telecom carriers' blockchain consortium and will drive the creation of blockchain-enabled services, such as Cross-Carrier Payment Systems (CCPS) – a blockchain-based global payment system offering streamlined cross-carrier mobile payments and cross-carrier remittances through mobile wallets to end users. The blockchain system was developed by CBSG Consortium founding member, TBCASoft, a U.S.-based blockchain technology company. "The advantages of blockchain are becoming widespread throughout the world, and unlocking the potential of this technology is essential for empowering individual users and

creating new value within the UAE's enterprise community. By joining the CBSG, our involvement with this expert consortium of industry leaders will launch the adoption of blockchain in the UAE telco sector and align us with the objectives of the UAEBlockchain Strategy 2021. This reflects our continual commitment towards creating safer, more secure networks and a refined focus towards the exploration of blockchain's endless possibilities," said Osman Sultan, CEO of EITC. As an active enabler of blockchain solutions in the UAE, du will build upon its capabilities by facilitating developments in transparency, security, real-time transactions, and data protection to address pain points across industries and to leverage blockchain solutions for its customers. "The CBSG Consortium has been gaining momentum because of our unique vision of a cross-carrier blockchain platform that has no reliance on crypto-currencies. We are excited to welcome du to the consortium," said Ling Wu, Founder and CEO of TBCASoft. Mr. Wu is also Chairman of the CBSG Consortium.

# du Plans End-2019 5G Launch

du, one of two telecoms operators in the United Arab Emirates, says it is looking to launch 5G mobile services towards the end of this year. A report from Mubasher says the telco will offer 5G connectivity to individual users once handsets supporting the technology hit the market. In November 2018 the Telecommunications Regulatory Authority (TRA) issued 5G wireless spectrum to the country's two incumbent telcos, Etisalat and Du. The pair were allocated frequencies in the 3.3GHz-3.8GHz range.



# Etisalat Digital Accelerates Adoption of Artificial Intelligence and Blockchain in the Region

Future Now, the innovation program of Etisalat, has signed agreements with four scaleups to develop Artificial Intelligence and Blockchain solutions following the successful Dubai Future Accelerators program. The signing ceremony also marked the opening of the Future Now scale-up collaborative space for Etisalat Digital's partners, namely Yitu Technology (China), Com IoT Technologies (UAE), 300cubits (Hong Kong), and Tradefin (USA). They were chosen based on their capability to build and launch their core technology and be able to demonstrate traction and substantial use cases. These selected companies will continue their journey through the 'Future Now' scale-up program, where they will receive access to Etisalat Digital resources and experts, office space, and support needed to deliver joint projects to Etisalat's client base. As part of the fifth cohort of Dubai Future Accelerators, Etisalat Digital launched in July this year three challenges to companies across the world. Out of all the companies that applied, seven companies were selected to address these challenges. The companies had the opportunity to network with a number of key stakeholders and have access to resources and expertise. Etisalat Digital selected two companies, Yitu Technology (China), and Com IoT Technologies (UAE), for the first challenge that sought to leverage artificial intelligence for video surveillance systems and create solutions that would reduce crime rates and road congestion. To support the UAE 2021 vision of making the UAE the safest place in the world, the challenge focused on scaleups that could deliver solutions that would analyse behavior and predict crime-related patterns, in addition to enhancing transportation issues like congestion and accidents, and take automated decisions with the use of artificial intelligence on existing video surveillance systems. The second challenge addresses the use of Blockchain to reduce the transactional costs and complexity in business processes for banks, governments and private organizations, with the goal of reducing the costs and complexity by 40 percent over five years. 300cubits (Hong Kong) was selected for this challenge.

Tradefin (USA) was selected for the last challenge that was focused on the adoption of Blockchain to enable exchange across various loyalty currencies and to transform a loyalty currency into a crypto currency that can be used to perform online and physical transactions. In line with the Future Now's vision of accelerating innovation, the partnerships will fast track the deployment of latest technologies such as Artificial Intelligence and Blockchain to avail them to Etisalat's client base. The scale-up program is a key pillar of the Future Now ecosystem that aims to provide a collaborative platform for innovators, partners and customers to expedite the adoption of such cutting-edge technologies.

# Etisalat Sets New Record as First Middle East Brand Portfolio to Break US$10bn Barrier

Etisalat received 'The Most Valuable Portfolio Brand' in Middle East and North Africa (MENA) by Brand Finance as a recognition for the company's impressive portfolio of brands becoming the first Middle East group to break the US$10 billion barrier in terms of wider portfolio value. Etisalat boasts of a portfolio of brands such as Etisalat Misr, Mobily, Ufone, Maroc Telecom, PTCL and Etisalat Afghanistan. The company has also seen an 8 percent growth since last year, resulting in becoming the first Middle Eastern brand to hold such a wide portfolio. For the second consecutive year, Etisalat also retained its position as the most valuable consumer brand in the Middle East and Africa. "We are proud to achieve the recognition as the most valuable portfolio brand and the first Middle Eastern brand to break the US$10 billion barrier in terms of wider portfolio value in the MENA region. Thanks to the UAE leadership's support, vision and encouragement that helped Etisalat achieve this significant milestone surpassing some of the top renowned regional brands. This achievement is also due to our continuous efforts in digital transformation whereby we have amplified our reach and presence in a highly competitive marketplace by investing in new digital platforms and global brand building initiatives. Etisalat's success as a brand was also reinforced by the synergy of operating companies across our footprint, creating brand loyalty and enhanced engagement with our customers," said Saleh Abdullah Al Abdooli, CEO, Etisalat Group. David Heigh, CEO, Brand Finance said: "It is a real testament to the leadership of the UAE that Emirati brands are leading the charge for the Middle East, amongst the world's most valuable brands. As celebrations for the 'Year of Zayed' wrap up, we recognize the achievements, will and determination of the UAE's Founding Father, the late Sheikh Zayed bin Sultan Al Nahyan." Operating in 15 countries across Asia, Middle East and Africa,

Etisalat's success can also be attributed to its continued efforts in developing its customer loyalty programmes, sports sponsorship commitments and in driving the digital future to empower societies. Etisalat pioneering 5G efforts in the region and delivering one of the fastest, smartest and best-connected places on earth during the global mega Expo 2020 Dubai has attributed to its success as a brand in the region. As the premier digital and telecommunications partner of Expo 2020 Dubai, Etisalat is prepared to deliver the event's visitors and delegates 5G connectivity that brings the Expo themes to life for the 25 million expected visitors. Several factors have attributed to the success and growth of Etisalat's brand value mainly driven by an innovative customer service driven strategy, adapting well to a digital savvy marketplace, leading the 5G revolution and the successful launch of global brand building initiatives. Etisalat has also led digital innovation in the country with its overall strategy focused on 'Driving the Digital Future to empower societies' by working on several

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

# Etisalat's 'OneCloud Platform' Provides the Foundation of ASGC's Digital Transformation

Etisalat announced its strategic partnership with ASGC Construction to provide Enterprise Level Cloud Solutions combined with its secure managed IP connect service as part of their digital transformation roadmap. Herbert Fuchs, Chief Information Officer at ASGC, said: "We've selected Etisalat and their OneCloud Services as it perfectly meets our needs from scalability, flexibility, reliability and performance perspectives while at the same time offering the most attractive ROI among the cloud vendors that we've analyzed. "Etisalat's OneCloud platform represents one of the foundations in our digital transformation roadmap which spans across all aspects of our business – ranging from the IT operations and service delivery to cross departmental core business process automation onwards to construction asset optimization as well as labor productivity and labor safety aspects." Ragy Magdy, Vice President/ Enterprise Sales at Etisalat, said: "We are pleased to offer Etisalat's OneCloud Services that cater to the growing needs of ASGC, a leading construction company in the UAE, and set a benchmark in the construction sector. With Etisalat's

corporate strategy focusing on 'Driving the digital future', we are working closely with all our customers and partners to transform their businesses by investing in digital services and solutions. "Etisalat's OneCloud solution is a vital tool in enabling ASGC's digital transformation that aims to reduce its IT capital spend and operational expenses while simultaneously increasing

IT agility in a secure environment." Etisalat OneCloud offers a wide range of cloud solutions designed to satisfy the security, performance and data location needs of UAE enterprises. This end-to-end managed cloud solution includes infrastructure-as-a-service, managed security services, managed backup, managed applications and managed disaster recovery services.



# Zain Recognized as 'Best Telecom Company in Kuwait' for 2018



Zain Kuwait, the leading digital service provider in Kuwait announces that its huge investment in 5G has made lots of progress recently and the operator is ready to go live with the state-of-the-art service across all strategic and heavily populated areas of Kuwait. Zain will continue developing and expanding the 5G network gradually across Kuwait until the devices are available, expected during the course of 2019. The company also is awaiting approvals and spectrum allocation from the country's regulatory authorities. Once commercially launched, the 5G network will empower government entities and enterprise (B2B) digital transformation,

smart city development and the fourth industrial revolution. Fifth-generation technology represents a quantum leap in the operational efficiency of Zain's network which will make it one of the first companies in Kuwait and the region to adopt this solution to meet the ever-growing digital needs of its individual and enterprise customers. Telecom services are one of the most important sectors in accelerating economic growth and promoting trade. Existing mobile networks will not be able to satisfy the future needs of the telecommunications sector and 5G technologies will contribute to the

digital transformation and prosperity of Kuwait supporting the leadership's future 2035 vision for the country and its people. The practical applications offered by 5G technologies will expand the scope of services provided by Zain Kuwait especially to the government and enterprise (B2B) sector, who will benefit enormously from high speeds, stimulating both the economic growth of the country as well as creating boundless new business opportunities, especially in the delivery of unique products and services, smart cities, and Internet sectors. This announcement follows the MoU signed

during a two-day strategy summit held in Shanghai in October 2018 between Zain and Huawei whereby the two companies discussed and assessed the expected business cases for 5G in the region, including its impact on IoT, mobility, connectivity, healthcare, government; and other essential sectors. Zain is on track to have its operations in Kuwait be the first to launch 5G commercially, maintaining its technology leadership in the quality and range of services offered to the country's community, whether it be government, enterprises or individuals.

# App Store Caps Record-Breaking 2018 with Blockbuster Holiday Week

Apple announced that App Store customers worldwide set new spending records over the holidays, wrapping up a record-breaking year. App Store spending topped US$1.22 billion between Christmas Eve and New Year's Eve. Customers also spent over $322 million on New Year's Day 2019 alone, setting a new single-day record. "The App Store had a record-breaking holiday week and New Year's Day. The holiday week was our biggest week ever with more than $1.22 billion spent on apps and games, and New Year's Day set a new single-day record at more than $322 million," said Phil Schiller, Apple's senior vice president of Worldwide Marketing. "Thanks to the inspiring work of our talented developers and the support of our incredible customers around the world, the App Store finished off an outstanding 2018 and kicked off 2019 with a bang." Apple announced Wednesday that the App Store helped drive Services revenue to an all-time record in the holiday quarter. Apple services set new all-time records in multiple categories, including the App Store, Apple Music, Cloud Services, Apple Pay and the App Store's search ad business. Gaming and self-care were the most popular categories of app downloads and subscriptions during the holidays.

Globally, multiplayer games including Fortnite and PUBG were among the top downloaded games over the holidays, along with Brawl Stars, Asphalt 9 and Monster Strike. Productivity, Health & Fitness and Education apps are already capturing the attention of customers in the first few days of the year with 1Password, Sweat and Lumosity charting in their respective categories. Apple revolutionized personal technology with the introduction of the Macintosh in 1984. Today, Apple leads

the world in innovation with iPhone, iPad, Mac, Apple Watch and Apple TV. Apple's four software platforms — iOS, macOS, watchOS and tvOS — provide seamless experiences across all Apple devices and empower people with breakthrough services including the App Store, Apple Music, Apple Pay and iCloud. Apple's more than 100,000 employees are dedicated to making the best products on earth, and to leaving the world better than we found it.
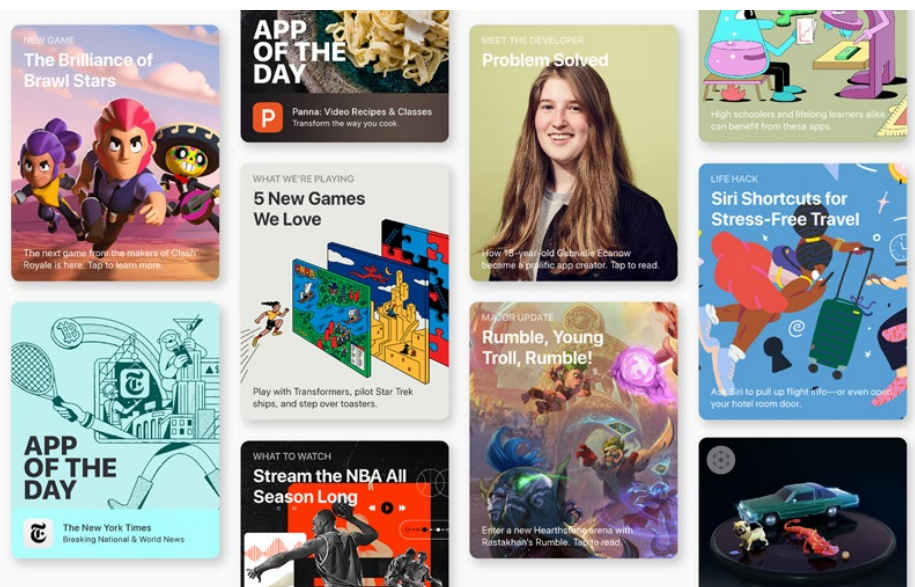
# Apple Inks Samsung Deal as Services Drive Continues

Zain Kuwait, the leading digital service provider in Kuwait announces entering an agreement with Zain Drone to undertake inspections of its tower infrastructure. The agreement sees Zain Kuwait as one of the first operators in the MENA region to deploy drone technology to inspect and maintain its cell tower infrastructure, demonstrating the operator's drive to become a more agile and cost-efficient operator. The agreement also represents the first commercial deal for Zain Drone. The pioneering Zain Drone as-a-Service (DaaS) offering was announced at a ceremony at GITEX in Dubai in October 2018, with the business set to unlock opportunities in various industries to fast-track growth and exploit the Internet of Things (IoT) in an efficient, safer and faster way. The

offering delivers state-of-the art bespoke drone solutions and provides advanced analytics for governments and businesses. In a growing trend globally for the telecom sector, progressive mobile operators have identified the need to constantly monitor their towers to ensure smooth and hassle-free relay of signals between devices and infrastructure to ensure a great mobile experience for customers. Drone cell tower inspection reduces costs and the time taken to detect any flaws considerably, as well as providing companies with complete details of defects through visual imagery, making it easier to develop lasting solutions for the problems that are identified. Commenting on the agreement, Zain Kuwait Chief Technology Officer, Nawaf Al Gharabally said, "Zain Kuwait is a

flagship operation within the Group, and as such it is important for us to lead the way with regards to developments related to efficiency and infrastructure maintenance. Zain Group has always benefited from its broad portfolio of operations, be it from a geographic perspective or a technological one, and tying up with Zain Drone is another example of how strong synergies are being driven within the Group to significant positive effect." AbdulAziz Jawad, CEO of Zain Drone said, "We are pleased to announce our first commercial agreement with Zain Kuwait, one of the most innovative and forward-looking telecom operators in the region. Our business case is based on providing tools to our partners that help them optimize their operations and maximize gains from the efficient running of infrastructure. Kuwait will be a great showcase market for the capabilities of Zain Drone-as-a-Service, and we look forward to winning further business in Kuwait and other markets across the region from Zain operations as well as from non-Zain affiliated organizations." Zain Drone is investing heavily to build the required capabilities in drone operations and is positioning itself to become the leading strategic partner in the fast-developing markets for unmanned data acquisition. The Zain Group enjoys solid in-house expertise in drone technology, drawing from international experts, and enjoys unparalleled knowledge of the enterprise market in Kuwait and across the region.
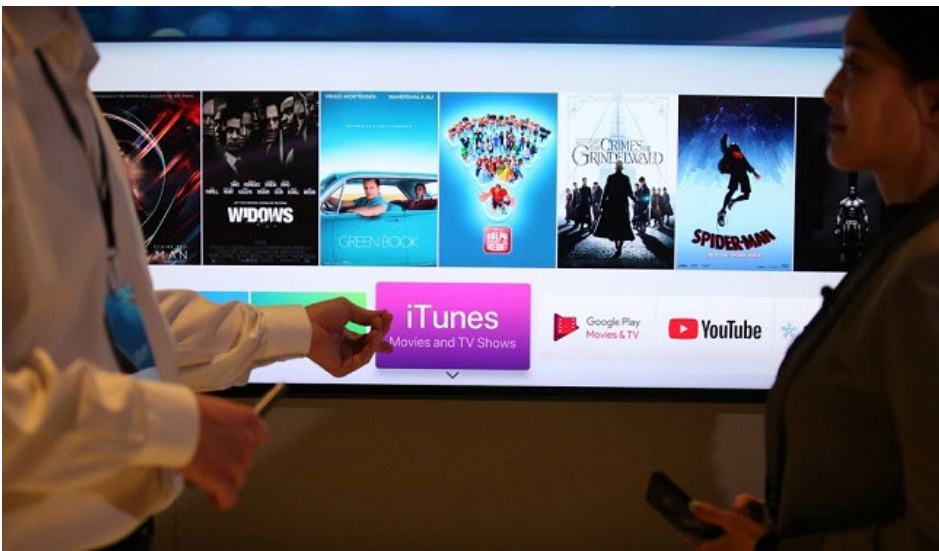


# BT Scores Telecommunications Licenses in China

BT announced Thursday that it's the first international telecommunications company to garner nationwide licenses in China. BT received two "value added licenses" from the China Ministry of Industry and Information Technology. The China nationwide Domestic IP-VPN license and China nationwide Internet Service Provider (ISP) license allow BT China Communications Limited to contract directly with its cus-

tomers in the country and bill them in local currency. While the licenses are a milestone for BT, it didn't have to contend with China's "great firewall" to get its traffic out of the country using the internet infrastructure. "This is about providing physical connectivity rather than content services or management of data that travels over the network," BT said via an email to Fierce-Telcom. The value added licenses give BT

more reach for its multinational customers that want to expand their business efforts inside of China. "We are delighted with this major benefit for our customers," said BT's Bas Burger, CEO of Global Services, BT, in a prepared statement. "Thanks to cooperation between the governments of the PRC and the U.K., we are now able to offer a nationwide service in China that can be scaled up to match the ambitions and

needs of our customers. Being able to service and bill locally significantly simplifies the process of delivering connectivity and other communication services. It is what our customers expect from us and we are very grateful for the opportunity to do this

as of today." BT won the licenses against the backdrop of increased tensions over China-based Huawei being banned for use in some countries' 5G networks, including New Zealand and Australia, and security espionage concerns in the United States

and the U.K. Last month, Reuters reported that BT was removing Huawei Technologies' equipment from the core of its existing 3G and 4G mobile operations and that it would not use the Chinese company in central parts of its 5G network.

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## Cisco and ADSSSA Embark on Digital Acceleration Initiatives

Premier and Minister of Housing, Utilities and Urban Communities Mostafa Madbouly witnessed the ceremony of signing a Memorandum of Understanding (MoU) between the Ministry of Communications and Information Technology (MCIT) and Cisco, the world's leading company in IT and networking areas, to promote digital transformation and stimulate technological innovation. The MoU was signed by the Information Technology Industry Development Agency (ITIDA) Acting CEO Maha Rashad and Cisco General Manager Ayman El Gohary. The MoU is within the framework of implementing the Country Digital Acceleration Program (CDA), launched by Cisco in the Middle East and Africa two years ago, to help the countries in implementing their digital development plans. The program is implemented in Egypt in line with Egypt's Vision 2030 and focuses

on the digital acceleration in implementing a number of initiatives based on Cisco's global experience in digital transformation. The Minister of Communications and Information Technology Amr Talaat stated that, under the MoU, Cisco partakes in the implementation of MCIT strategies for building capacities and developing digital skills, particularly those related to presidential initiatives, including the IT national academy for People with Disabilities (PwDs), and the Presidential initiative "Africa Games and Digital Applications. The MoU stipulates that Cisco is to expand "Cisco Networking Academy" program in Egypt and double the number of Egyptian and African students benefiting from the program to reach approximately 20,000 in 2019, and up to 30,000 in 2020. The ICT Minister added that the MoU entails cooperation in

implementing the digital integration of a number of sectors, including education and digital services, through building on the increasing use of ICTs and benefiting from the post offices network throughout Egypt, thus post offices can be main centers for citizens to receive various digital services. Cisco, under the MoU, is to implement a number of initiatives that will contribute to implementing the government's digital agenda and work on the deployment of Internet of Things (IoT) technologies and smart city solutions in Egypt. Cisco will also support MCIT efforts in digital health areas by leveraging Cisco technologies in automating at least 40 health units. In the field of entrepreneurship and startups, Talaat stated that Cisco will cooperate with the Technology Innovation and Entrepreneurship Center (TIEC), affiliated to the Information Technology Industry Development Agency (ITIDA), to create a sustainable creative environment through providing training to local startups. The ICT Minster said that this cooperation emphasizes MCIT commitment to implement digital transformation as soon as possible in Egypt and to promote the growth of the ICT sector in line with Egypt's vision 2030. He added that MCIT seeks to create a supportive environment to equip young creative calibers with the digital skills necessary to keep pace with technology developments and meet market future needs. Cisco program aims to accelerate the digital transformation in Egypt at all levels. The company seeks to strengthen its commitment to cooperate with Egypt in this field. Since 1999, more than 95,000 students has benefited from Cisco Networking Academy courses, and accordingly, 92% of its graduates have found employment opportunities and continued their education in the same field.

# Cisco CEO Warns Higher Tariffs Will Force Companies to Cut R&D

Cisco Systems Inc. Chief Executive Officer Chuck Robbins cautioned U.S. officials against increasing tariffs on Chinese goods, saying it would come at the expense of American innovation. U.S. companies will end up absorbing the costs of higher tariffs, spending less on the research and development that can lead to technological breakthroughs, Robbins said during a meeting with government officials in D.C. earlier this month. He told Bloomberg News that he was representing the view of several big U.S. technology companies in addition to his own: Hewlett Packard Enterprise Co., Dell Technologies Inc. and Juniper Networks Inc. "If we go to the next wave in tariffs, tech companies in the U.S. will have to absorb that and cut back in R&D when what they

want us to do is lead in innovation," Robbins said in an interview at Bloomberg's New York office. Cisco, like many U.S. hardware companies, uses contract manufacturers in Asia -- mainly China - to make its products. That makes it susceptible to U.S. tariffs when bringing those goods into its home market, increasing costs. Robbins said Cisco has been able to absorb tariffs at current levels by making its supply chain as efficient as possible and passing some costs onto customers. But unless trade talks with China produce a deal by March 1, the White House is set to increase tariffs to 25 percent from 10 percent on US$200 billion of Chinese goods. That would potentially put funds for research and development in jeopardy, Robbins said. Cisco allocated more than US$4 billion in 2017 to R&D in the U.S. for networking products, according to a joint filing by Cisco, Hewlett Packard Enterprise, Dell and Juniper last September. The companies asked U.S. Trade Representative Robert Lighthizer to spare their products from additional tariffs. Juniper put almost 20 percent of its global revenue toward research and development, while Hewlett Packard Enterprise invested US$1.5 billion, the firms wrote. In addition to having less to invest back into their businesses under higher tariffs, companies are also less likely to collaborate with others on research, according to Bloomberg Economics Chief Economist Tom Orlik. Even if firms do have money available to spend, they may hold off on research and development due to the heightened uncertainty, he added. "The flip side of that, of course, and the argument which the U.S. government makes is that it's China's intellectual property theft which is the real disincentive to R&D investment," Orlik said.



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# SSTL Finishes Build for Eutelsat Quantum Satellite

Surrey Satellite Technology (SSTL) completed the build of the platform for Eutelsat Quantum, the first Geostationary Orbit (GEO)



telecommunications satellite that will be fully reconfigurable in orbit. The Eutelsat Quantum satellite is being built under a public–private partnership between the European Space Agency (ESA) and Eutelsat, with Airbus as the prime contractor. Eutelsat Quantum uses technology developed by Airbus and SSTL in the U.K. under the ESA Advanced Research in Telecommunications Systems Program (ARTES) and supported by the U.K. Space Agency. The platform consists of a composite central thrust tube, which houses a bipropellant chemical propulsion system that will enable the satellite to stay on station throughout its 15 year lifetime. "The completion of our work on the Eutelsat Quantum satellite platform is an important milestone for SSTL as it represents our first venture into the global commercial telecoms satellite market," said SSTL Managing Director Sarah Parker. "The design and assembly of this innovative spacecraft has enabled us to advance the knowledge and skills required to develop highly capable satellite products for the evolving telecoms market, where we are actively engaged in seeking new opportunities."

# Konnect Africa to Launch Satellite Broadband in Côte d'Ivoire

Konnect Africa, an initiative from Eutelsat dedicated to satellite broadband on the African continent, revealed that it is launching internet access offers in Côte d'Ivoire. According to the Telecommunications Sector Observatory of the Telecommunications Regulator/ICT of Côte d'Ivoire (ARTCI), the number of fixed internet subscribers in Côte d'Ivoire stood at 155,541 in the second quarter of 2018,

representing 0.6% of the total population. At the same time, according to Deloitte's TMT 2017 report, the country has 9 million mobile internet subscriptions. Some areas of Ivorian territory, however, are not properly served by mobile technology. Konnect Africa aims to help to bridge the digital divide in Côte d'Ivoire by offering its broadband Internet offers to individuals and professionals, particularly outside

major cities, where no reliable broadband solution is available. Konnect Africa has also joined forces with local partners in Côte d'Ivoire, including Lifi-Led, Watec, Open Services, HubLive, and Ecosat. Konnect Africa is targeting rural areas in particular by offering an adapted and lightweight solution called Konnect Wi-Fi, which provides shared internet access through a single point of reception.

# HGC Links with Expresso to Serve Africa and Middle East

HGC Global Communications has expanded its services into the Middle East and Africa via a link-up with Dubai-based Expresso. HGC and Expresso will collaborate to extend the comprehensive network and data transmission in Africa and Middle East, said the companies. HGC aims to bring high-volume data transfer to African-based customers. Ravindran Mahalingam, HGC's senior vice president of international business, said: "We are delighted to collaborate with Expresso,

and to accelerate expanding telecom footprint from Africa to worldwide. We believe that through this industry collaboration, we can drive innovation, growth, and wide range of global data transmission solutions for local and regional customers." Expresso Telecom is a subsidiary of Sudan-based Sudatel Telecom, providing a one-stop center for the group's international operations, including wholesale and carrier relations. Expresso CEO Tarig Hamza Rahamtalla

said: "We will leverage each other's strengths to deliver quality services to our common customers – existing and future – given the global reach this partnership provides us." Mahalingam added: "We are delighted to collaborate with Expresso, and to accelerate expanding telecom footprint from Africa to worldwide." The companies listed advanced business solutions as including data center colocation, NNI, MPLS, IPLC, IPX, voice and messaging solutions and big bandwidth solutions.

# Facebook and Alcatel Submarine Networks Launch Aluminum Conductor for Subsea Cables

Alcatel Submarine Networks (ASN) and Facebook announce the availability of aluminum conductor cable for fiber-optic subsea cable systems. After what the company calls an "extensive testing and qualification program" the conductor has proven its suitability for ultra-long haul deep-sea transmissions systems. The demonstration included mechanical, electrical, optical and environmental tests carried out on deep-sea and armored cables during a sea trial. Najam Ahmad Vice President of Network Engineering at Facebook, said, "Our efforts are focused on expanding connectivity and increasing the adoption of innovative technologies, without compromising reliability. The use of aluminum cable in submarine systems represents an attractive evolution

as technology advances and demand increases for more data throughput and higher speeds." Using an aluminum conductor meets the needs of operators and content providers that require better support for growing demand and to reduce subsea cable costs. By introducing an alternative to the current copper conductors used in in repeated subsea systems costs are saved as copper is one of the most expensive raw materials. This new conductor has already been selected for a major long-distance project and is part of the SDM1 by ASN solution, designed to optimize the cost per bit. "The introduction of a new cable variant using aluminum conductor addresses the market demand for more cable capacity at a reasonable cost, while keeping the same level of

quality and reliability," said Philippe Piron, president and CEO of Alcatel Submarine Networks. "After the introduction of loose tube technology in submarine cables 25 years ago, ASN is again the first to bring an innovative improvement to submarine cable design, and continues to show its leadership by anticipating customer demands." Other benefits to the aluminum conductor include:

- Cost effectiveness with performance equal to copper.
- A sustainable supply market – driven by the oil and gas industry.
- Higher speed of production for the delivery of new systems.
- An enabler of solutions for low direct current resistance with a higher number of fiber pairs.

# Facebook and the Technical University of Munich Announce New Independent TUM Institute for Ethics in AI

Facebook has announced a new partnership with the Technical University of Munich (TUM) to support the creation of an independent AI ethics research center. The Institute for Ethics in Artificial Intelligence, which is supported by an initial funding grant from Facebook of $7.5 million over five years, will help advance the growing field of ethical research on new technology and will explore fundamental issues affecting the use and impact of AI. Artificial intelligence offers an immense opportunity to benefit people and communities around the world. But as AI technology increasingly impacts people and society, the academics, industry stakeholders and developers driving these advances need to do so responsibly and ensure AI treats people fairly, protects their safety, respects their privacy, and works for them. At Facebook, ensuring the responsible and thoughtful use of AI is foundational to everything we do — from the data labels we use, to the individual algorithms we build, to the systems they are a part of. We're developing new tools like Fairness Flow, which can help generate metrics for evaluating whether there are unintended biases in certain models. We also work with groups like the Partnership for AI, of which Facebook is a founding member, and the AI4People initiative. However, AI poses complex problems which industry alone cannot answer, and the independent academic contributions of the Institute will play a crucial role in furthering ethical research on these topics. The Technical University of Munich is one of the top-ranked universities worldwide in

the field of artificial intelligence, with work extending from fundamental research, to applications in fields like robotics and machine intelligence, to the study of the social implications of AI. The Institute for Ethics in Artificial Intelligence will leverage the TUM's outstanding academic expertise, resources and global network to pursue rigorous ethical research into the questions evolving technologies raise. The Institute will also benefit from Germany's position at the forefront of the conversation surrounding ethical frameworks for AI — including the creation of government-led ethical guidelines on autonomous driving — and its work with European institutions on these issues. Drawing on expertise across academia and industry, the Institute will conduct independent, evidence-based research to provide insight and guidance for society, industry, legislators and decision-makers across the private and public sectors. The Institute will address issues that affect the use and impact of artificial intelligence, such as safety, privacy, fairness and transparency. Through its work, the Institute will seek to contribute to the broader conversation surrounding ethics and AI, pursuing research that can help provide tangible frameworks, methodologies and algorithmic approaches to advise AI developers and practitioners on ethical best practices to address real world challenges. To help meet the need for thoughtful and groundbreaking academic research in these areas, Facebook looks forward to supporting the Institute and help offer an industry perspective on

academic research proposals, rendering the latter more actionable and impactful. The independent Institute will be led by TUM Professor Dr. Christoph Lütge, who holds degrees in business informatics and philosophy and has served as the Peter Löscher Endowed Chair of Business Ethics at TUM since 2010. Working with a diverse advisory board of representatives from academia, civil society and industry, the Institute will identify specific research questions and convene researchers focused on AI ethics and governance-related issues. "At the TUM Institute for Ethics in Artificial Intelligence, we will explore the ethical issues of AI and develop ethical guidelines for the responsible use of the technology in society and the economy," Dr. Lütge said. "Our evidence-based research will address issues that lie at the interface of technology and human values. Core questions arise around trust, privacy, fairness or inclusion, for example, when people leave data traces on the internet or receive certain information by way of algorithms. We will also deal with transparency and accountability, for example in medical treatment scenarios, or with rights and autonomy in human decision-making in situations of human-AI interaction." While Facebook has provided initial funding, the Institute will explore other funding opportunities from additional partners and agencies. Facebook may also share insights, tools, and industry expertise related to issues such addressing algorithmic bias, in order to help Institute researchers focus on real-world problems that manifest at scale. The Institute will also pursue opportunities to publish research and work with other experts in the field; organize conferences, symposia, and workshops; and launch educational activities with other leading institutions in common areas of interest. Realizing AI's huge potential for good while balancing its risks is a global effort, and it will not be accomplished overnight. The Institute is an exciting step forward in our continued commitment to partnering with academic institutions, governments, NGOs, advocacy and industry groups, and others who are working to advance AI in a safe and responsible way.

# Facebook Focuses on Digital Literacy to Improve Online Safety in Sri Lanka

Facebook's efforts to tackle misinformation, promote online safety in Sri Lanka and boost digital literacy skills were among several topics debated at a fireside chat, held as a part of the Fairway Galle Literary Festival 2019. Speaking to an audience of authors, professionals, academics and journalists, Shelley Thakral – Facebook's Head of Policy Programs for India, South Asia and Central Asia, took the opportunity to outline the steps Facebook has taken to tackle misinformation, as well as reiterating its commitment to continued progress. "We take misuse of our platform incredibly seriously and are committed to fighting misinformation and hate speech on the platform in Sri Lanka with the same energy and effort that we are demonstrating globally," said Thakral. Some of the programs that Facebook is scaling up in Sri Lanka are those aimed at promoting digital literacy and economic development in partnership with civil society organizations and local community groups. These initiatives include a digital literacy program run in conjunction with Sarvodaya, one of the oldest civil society organizations in Sri Lanka, to train up to 20,000 school children by the end of 2019 on how to engage on social media safely. Facebook has already trained more than 11,000 people, reaching more than 1200 villages across Sri Lanka. Chamindha Rajakaruna – Executive Director, Sarvodaya, who works closely with Facebook on this initiative said, "We are committed to empowering the next generation of digital users with the right tools and resources to have a safer online experience. Our partnership with Facebook enables us to reach thousands of young Sri Lankan women and men, helping them navigate this digital divide." A similar program called Smart Social Circles is operating in collaboration with the country's Information Communication Technology Agency to enhance connectivity within a Grama Niladhari Division and empower citizens through the effective use of digital technologies and ethical use of social media. At the same time, Facebook has supported Boost Your Business programs in Colombo to support local economic development, with more to follow in Kandy and Galle later this year. Its #SheMeansBusiness program was launched in Jaffna in 2018 encouraging aspiring women entrepreneurs to take their businesses online. This year, Facebook is planning to take the program to Kandy, Galle, Polonnaruwa and Kalutara.



# FCC Waves on Google Gesture Tech Research

Google secured approval from the US Federal Communications Commission (FCC) to continue development of a radar-based motion sensing technology for smartphones and other devices known as Project Soli. The sensor technology has been in development since 2015, but trials until now had been restricted to low power levels due to concerns from Facebook and others it might cause interference with existing technology operating between 57GHz and 64GHz. However, the FCC granted Google a waiver which will allow it to test the hand gesture technology both at higher power levels and on board aircraft going forward. The commission concluded there is "minimal potential" Project Soli will cause harmful interference, adding development of the product is in the public interest: "The ability to recognize users' touch less hand gestures to control a device, such as a smartphone, could help people with mobility, speech, or tactile impairments, which in turn could lead to higher productivity and quality of life for many members of the American public." Project Soli uses a tiny embedded chip to track motions of the human hand using radar beams, enabling touch less control of device functions. For instance, it allows users to push a virtual button by bringing together their thumb and index finger or twist a virtual dial by rubbing their thumb and forefinger together. Google has said it sees applications for Soli across smartphones, wearables, computers, cars and IoT devices, adding it is part of the company's vision of "a future in which the human hand becomes a universal input device for interacting with technology".

# Google Assistant Aims for Dominance at CES

Google announced new features, dozens of product integrations and an expansive plan to create a wider platform for its virtual assistant at CES. Google Assistant, which was first released in May 2016, has evolved into a standout product and Google's best chance of competing with Amazon's domination of the space with its Alexa assistant. The company is embarking on a bold plan to bring Google Assistant to millions of iPhones. Google Assistant will arrive on Google Maps for Android and iOS starting this week, expanding the reach and availability of the voice-enabled assistant by significant magnitude. The integration will allow Google Maps users to share their estimated arrival time with friends and automatically get directions home with their voice. Perhaps more importantly, though, it will introduce millions of Google Maps users on iPhone to the offering. Google also introduced a preview of Google Assistant Connect, which enables third-party device makers to more easily integrate the virtual assistant into their products. The company says Google Assistant now works with more than 1,600 home automation brands and more than 10,000 devices. At CES it announced support for more smart home devices later this year, included appliances, security systems and other connected devices. Google Assistant is coming to a range of new devices, including Instant Pot's Smart WiFi Programmable Pressure Cooker, Sub Zero's refrigerator and wine store, Wolf E-Series and M-Series ovens, Cove dishwashers and the U by Moen shower. Google also announced support for McAfee's Secure Home Platform, Rheem's Econet Smart Thermostat, the Côr 7C thermostat by Carrier, eMotorWerk's JuiceBox Level 2 and SolarEdge's EV Charging Solar Inverter. Irrigation products and water leak sensors are also on the horizon for Google Assistant, including LeakSmart Leak and Flood Protection, Flo by Moen, Rachio 3 Smart Sprinkler Controller, Rain Bird Smart WiFi Controllers and Orbit's B-Hyve. Philips Hue smart light bulbs will also gain a new feature called "gentle wake up" that simulates the sunrise 30 minutes before a morning alarm. Lenovo, Sonos, KitchenAid and Dish also announced new products or integrations with Google Assistant at CES. Google Assistant is also making headway in the automobile arena with forthcoming accessories that plug into a vehicle's socket and connect smartphones to car stereos via Bluetooth or auxiliary inputs. The Anker Roav Bolt, JBL Link Drive and the HumX by Verizon were all announced this week at CES, demonstrating Google Assistant capabilities. Google also announced new features that will enable users to gain more access to Google Assistant in the lock screen and automatically translate conversations on Google Home devices and smart displays. Google says the Google Assistant is now built into more than 1 billion devices, including Android phones. Active users have quadrupled in size during the last year, according to the company.
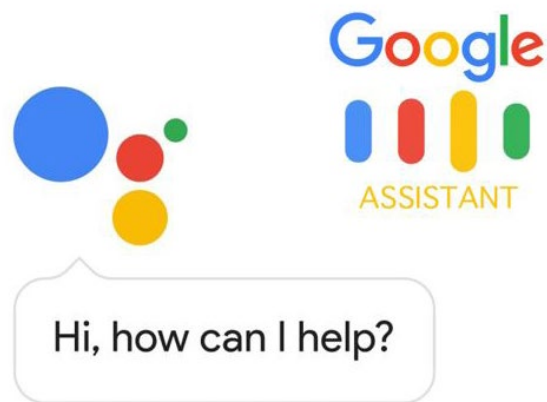


# Google Planning Band 48 Shared Spectrum (CBRS) Support for Pixel 3 in Future Update

Citizens Broadband Radio Service (CBRS) is a promising communication technology that utilizes shared spectrum. Several companies, including Google, and U.S. carriers are exploring the cost-saving potential, with the Pixel 3 possibly getting CBRS support in the future. The FCC (via XDA) disclosed a November request by Google to enable LTE Band 48 on the Pixel 3 (G013A) through a future software update. The 3.5GHz CBRS spectrum in the US requires Band 48 support, with Verizon announcing back in April that it was targeting CBRS-compatible devices and service by the end of 2018. By using LTE Advanced technology and carrier aggregation, Verizon will be able to use this shared spectrum to add capacity to its network. Verizon customers will benefit from more capacity, higher peak speeds and faster throughput when accessing the network. At the moment, the Pixel 3's Google Store spec page does not list Band 48, nor have the monthly security patches from Verizon noted any new band support. The change filed under this application is to enable LTE Band 48 operation through software. There is no hardware change. Software security remains unchanged from the original application. Additional RF, SAR, and HAC test reports/evaluation in B48 are included in the filing. The highest SAR values and HAC ratings remain the same as listed on the original grant. The central conceit behind Citizens Broadband Radio Service is shared spectrum. Sharing occurs between multiple parties with the 3.5GHz band split into three tiers. Priority is given to the military for Navy radar and other carrier-aircraft communication. A second tier is open to bidding from companies, but when not in full use can be made available to others. The third tier is dedicated to open and shared usage. Meanwhile, instead of acquiring spectrum licenses, carriers can instead share airwaves, which could help speed up 5G deployment moving forward. Google's role in CBRS is as a Spectrum Access System (SAS) provider that manages priority and usage on the network. For example, if a Navy vessel is near (along the coastal United States), consumers will be switched to other channels to not disrupt military usage.

# Google, Emirates Foundation to Partner on Arabic Language Initiative

Google has announced it is announcing its Arabic language digital skills initiative with a new partnership with the Abu Dhabi government. Through its philanthropic arm, the tech giant will grant the Emirates Foundation $300,000 to expand the scope and distribution of its Maharat min Google training programs in the UAE. The digital skills trainings and career pathway programs will roll out to 5,000 unemployed youth in rural areas and underserved communities, and will aim to help prepare them for and secure jobs. The Emirates foundation is an Abu Dhabi Government

initiative to facilitate youth empowerment and employment in the UAE. The programs will carry a target to have 50 percent of training delivered to women. Launched in April, the Maharat min Google program has delivered training to more 100,000 students across the Middle East, amassing mover 560,000 hours across 100 lessons and 26 core topics in digital marketing, including include search engine marketing, social media, video, e-Commerce, and data analytics. Trainings delivered have led to 15 percent of job seekers saying they have found a job, with 20% of knowledge

seekers saying they have grown in their career because of the program, according to a survey by Ipsos. "Our partnership with Google is a critical part of our model of Youth Development which is about solving social problems systemically and at scale," said Mohamed Al Hosani, Director of Programs at Emirates Foundation. "This requires more than just funding. By partnering with the private sector, we offer youth a unique opportunity for advanced skills development that will prepare them for the job market. We look forward to working with Google – only collectively can we achieve our goal of creating a positive and permanent impact on the lives of young people in the UAE," he added. Google has announced it is seeking more local partnerships across the region with governments, universities, private-sector businesses and nonprofits to expand the program. "Maharat Min Google is an all-Arabic and free one stop shop online platform on everything from building a website to marketing your business around the world. Earlier this year, we set out to do our part to fill this [digital skills] gap. through and we've been working with partners to help all Arabic speakers, whether they are students, employed individuals or job seekers to grow their skills, careers, and businesses through our digital skills program," said Tarek Abdalla, Regional Head of Marketing, Middle East & North Africa at Google.

# GCC Countries on Huawei's First Type of 5G Markets Globally

In his meeting with top international media held at Huawei HQ in Shenzhen China, Huawei Rotating Chairman Eric Xu openly answered media questions, addressed security concerns over Huawei and discussed Huawei's open engagements with external stakeholders. Mr. Xu said: "Cyber security, first and foremost, should be a technical issue; it should not become a political issue. The most effective way to address cyber security issues is to establish cyber security standards that are transparent, clear

and fair to all participating companies". On the US allegations, He said: "I don't know what their intention is. We virtually have no equipment that is running in US networks. No matter it's AT&T, Verizon, T-Mobile or Sprint, none of them is using Huawei equipment. In the US, we do have several base stations that are being used by telecom operators, but those are very small rural telecom operators. The US is essentially not using Huawei's equipment, so what kind of a security threat we can possibly pose to the US? Since Huawei's

equipment is not used in the US networks, is the US having the most secure networks in the world? I don't think so. Based on what we see right now, cyber security is no longer a technical issue, because technical issues can always be resolved through the right solutions. Therefore, we think cyber security is a political issue. And maybe an ideological issue". "It seems the US government is not only interested in the cyber security of itself. They're also interested in the cyber security of other countries. I don't believe that if Huawei

shuts itself down, selling nothing to the world, then all the networks in the world would be secure. If someone can prove that if Huawei does not exist and then people would not have to worry about cyber security and networks in the world would be secure, then probably shutting down Huawei would be a good option" he added. On the existing communication channels between the US and Huawei, Mr. Xu said: "We do not have communication channels with the US right now. We tried in the past. But now we do not have access of communication. And currently we do not have a willingness to further communicate with the US government. Rather, we would focus our time and effort to engage and communicate with governments and customers that are willing to engage with Huawei". On Huawei 2018 business figures and 2019 outlook, Eric Xu said: "Even though there have been so many different types of media stories, in fact these voices still come from a very few number of countries. For Huawei, all of our business operations are normal. Our revenue in 2018 reached US$108.5 billion. That was 20%+ increase compared to the previous year. We anticipate continued growth for 2019 at a rate of over 10% to reach US$125 billion in annual revenue. On 5G, he said: "All the teams within Huawei that are focused on 5G development or 5G productization have a full confidence about 5G. They want to see better growth for our 5G business. I think this is totally understandable, because 5G is like their "son". They want their "son" to be good. If you talk with those people, I think essentially what they say will be all positive. They will say 5G is coming soon, and demand for 5G is enormous". "I think there are three different types of markets in the world. And the three different types have different requirements for 5G. The first type of market includes China, Japan, South

Korea, and GCC countries in the Middle East, where data traffic consumption is growing very fast and there is real need for 5G. In those markets, I believe 5G will grow faster and the user demand for 5G will be greater than in other markets". "The second type of market is Europe, where real demand for 5G has not come yet. Even 4G is not very developed in this market. Therefore, European countries would still go for 5G deployment, but the scale would not be very significant. One of the primary considerations for 5G deployment is for marketing and branding purpose". "The third type of market is where 4G has not started in a big way. 5G would be pretty far away for those markets". As of the link with the Chinese government, Eric Xu said: "As a private Chinese company, Huawei falls under the jurisdiction of the Chinese government, so there must be some kind of link. But any suspicion, any guess, would at its very best, remain a suspicion and a guess. Mr. Ren also mentioned that as a privately owned enterprise in China, if we want to pursue commercial success, we must follow our own business ethics. We will never harm the interests of any

customer or nation". "China's Ministry of Foreign Affairs has already clarified that no law in China requires companies to install mandatory backdoors in their equipment. Up until now, Huawei has never received any such requests" he added. On the US China negotiations and Huawei CFO issue, Mr. Xu said: "Of course we look forward to positive outcomes from the trade negotiations between China and the United States. Because after such a long period of time, I believe both countries have seen the level of interdependence between the two sides. No party can live without the other. However, it has always been Huawei's position that we do not want to become one of the items on the negotiation agenda between China and the US. Because Huawei is too small compared with China and the United States. As Mr. Ren put it, we're just like a sesame. Definitely the national interests of two big powers cannot be affected because of one single company. Therefore, our position is very clear. We would resort to legal means to address this situation. We believe the legal systems of Canada and the United States are open and fair".

## Huawei Launches 5G Multi-mode Chipset and 5G CPE Pro

Huawei officially launched its 5G multi-mode chipset Balong 5000 – along with the first commercial 5G device powered by it, the Huawei 5G CPE Pro. Together, these two new products provide the world's fastest wireless connections for your smartphone, your home, the office, and on the go.

Balong 5000 officially unlocks the 5G era. This chipset supports a broad range of 5G products in addition to smartphones, including home broadband devices, vehicle-mounted devices, and 5G modules. It will provide consumers with a brand new 5G experience across multiple scenarios.

"The Balong 5000 will open up a whole new world to consumers," said the CEO of Huawei's Consumer Business Group, Richard Yu. "It will enable everything to sense, and will provide the high-speed connections needed for pervasive intelligence. Powered by the Balong 5000, the Huawei 5G CPE Pro enables consumers

to access networks more freely and enjoy an incredibly fast connected experience. Huawei has an integrated set of capabilities across chips, devices, cloud services, and networks. Building on these strengths, as the leader of the 5G era, we will bring an inspired, intelligent experience to global consumers in every aspect of their lives."

**Balong 5000: Ushering in the 5G era**

With a small form factor and high degree of integration, Balong 5000 supports 2G, 3G, 4G, and 5G on a single chip. It effectively reduces latency and power consumption when exchanging data between different modes, and will significantly enhance user experience in the early stages of commercial 5G deployment. Balong 5000 marks a significant step forward for the Balong series of chipsets. Balong 5000 is the first chipset to perform to industry benchmarks for peak 5G download speeds. At Sub-6 GHz (low-frequency bands, the main spectrum used for 5G), Balong 5000 can achieve download speeds up to 4.6 Gbps. On mmWave spectrum (high-frequency bands used as extended spectrum for 5G), Balong 5000 can achieve download speeds up to 6.5 Gbps – 10 times faster than top 4G LTE speeds on the market today.

Balong 5000 is also the world's first chipset that supports both standalone (SA) and non-standalone (NSA) network architectures for 5G. With non-standalone, 5G network architecture is built on top of legacy 4G LTE networks, whereas standalone 5G, as the name implies, will have its own independent architecture. Balong 5000 can flexibly meet different user and carrier requirements for connecting devices throughout different stages of 5G development. Balong 5000 is the world's first multi-mode chipset that supports Vehicle to Everything (V2X) communications, providing low-latency and highly reliable solutions for connected vehicles. Huawei's 5G smartphones powered by Balong 5000 will be released at this year's Mobile World Congress in Barcelona.

**Huawei 5G CPE Pro: Changing user experiences in home broadband networks**

Powered by Balong 5000, the Huawei 5G CPE Pro supports both 4G and 5G wireless connections. On a 5G network, a 1-GB HD video clip can be downloaded within three seconds, and 8K video can be streamed smoothly without lag. This sets a new benchmark for home CPEs. In addition to homes, the Huawei 5G CPE Pro can also be used by small and medium-sized enterprises for super-fast broadband access. Adopting new Wi-Fi 6 technology, the Huawei 5G CPE Pro delivers speeds of up to 4.8 Gbps. It is the first 5G CPE that supports HUAWEI HiLink protocols, bringing smart homes into the 5G era. As a 5G pioneer, Huawei began research and development in 5G as early as 2009, and is currently the industry's only vendor that can provide end-to-end 5G systems. Huawei has more than 5,700 engineers dedicated to 5G R&D, including over 500 5G experts. In total, Huawei has established 11 joint innovation centers for 5G solutions worldwide.

# Huawei Unveils New ARM-Based Chipset and Server

Huawei is attempting to move on from last year's turbulence by announcing a new server and chipset at its Shenzhen media conference. The ARM-based CPU is called Kunpeng 920, and Huawei is claiming it's the highest performance chipset in the industry. In addition to the 64-core chip, Huawei also announced its new ARM-based TaiShan server. Huawei said it developed the new chipset and server in response to the growing use of big data, edge computing and artificial intelligence. While Huawei has a history of working with Intel, it decided to develop its own chipset and server based on the ARMv8 architecture license. "We believe that, with the advent of the intelligent society, the computing market will see continuous growth in the future. Currently, the diversity of applications and data is driving heterogeneous computing requirements," said Huawei's William Xu, director of Huawei's board and chief strategy marketing officer, in a prepared statement. "The Kunpeng 920 CPU and TaiShan servers newly released by Huawei are primarily used in big data, distributed storage, and ARM-native applications. We will work with global partners in the spirit of openness, collaboration, and shared success to drive the development

of the ARM ecosystem and expand the computing space, and embrace a diversified computing era." Xu also said that Huawei would continue to work with Intel. Huawei said it improved the processor performance by optimizing branch prediction algorithms, increasing the number of OP units and improving the memory subsystem architecture. Huawei claimed that at typical frequency, the Kunpeng 920 CPU scored over 930 in

the SPECint Benchmarks test, which is 25% higher than the industry benchmark. Huawei said the TaiShan server would enable computing platforms with high performance and low power consumption for enterprises. For example, in big data scenarios, the TaiShan servers can be tuned for optimal multi-core high concurrency and resource scheduling to deliver a 20% computing performance boost.



# Huawei Releases Wireless Fiber Solution to Increase HBB Rates and Improve Penetration

Huawei released the latest Wireless Fiber Solution (an enhanced WTTx solution). Huawei focused on how to maximize wireless network potential and quickly provide broadband services. This presented a unique opportunity to meet with government ICT organizations, operators, and industry organizations to discuss fixed wireless broadband development and how to accelerate national broadband penetration. Huawei's Wireless Fiber solution increases home broadband (HBB) rates and improves market penetration. Rapidly developing LTE technologies, such as wideband 4T4R and massive MIMO, have significantly improved wireless bandwidth, capability, and greatly reduced the cost per GB.

LTE has become a viable solution for broadband rate improvement. 5G spectrum release and various new 5G technologies will further improve spectral efficiency, capacity, and reduce the cost per GB to enhance the capability of wireless fiber broadband. Wireless fiber broadband has become an option to improve broadband rates. According to the Digital Economy and Society Index Report 2018 in Europe, wired broadband rates in Europe are between 7 Mbit/s and 23 Mbit/s, and the LTE rate has already reached between 20 Mbit/s and 42 Mbit/s. 37% of households in Finland and 23% in Italy use only LTE wireless technologies to access the Internet. Wireless fiber broadband speeds up broadband popularization in developing

countries. Wireless broadband services have been rolled out in many developing countries, such as the Philippines, Sri Lanka, and South Africa, to significantly accelerate national broadband development. The growth rate of wireless broadband has surpassed that of fixed broadband. As a result, the broadband penetration rate increased from 12% to 17% in the Philippines, and from 9% to 25% in Sri Lanka. Over the past five years, 230 operators in 124 countries have deployed WTTx to provide fixed wireless broadband services for 75 million households, small- and medium-sized enterprises (SMEs), schools, and hospitals. Huawei's Wireless Fiber solution creates the following benefits:

## Full services

With the popularization of HBB services, people have more and more diversified requirements for broadband access, such as telephone access, Internet, and VOD through broadband set top boxes. As for enterprise broadband private line access services, the headquarters and branch offices of SMEs require VPN-based intranet and mobile office services. These services depend on VoIP, VPN, video surveillance, and other network capabilities. The Wireless Fiber solution supports a full range of diverse services, including broadband, video, VoIP, and VPN, helping operators deploy a basic, full-service broadband network for both households and enterprises.

## Fiber-like experience

The Wireless Fiber solution offers a Gbps-level broadband experience, helping operators provide superior HBB services. Huawei's innovative massive MIMO and wideband 4T4R full-series base stations work with high-end CPEs (which are stationary) to improve spectral efficiency by three to five fold. Along with the Wireless Fiber solution, Huawei released the industry's first 8-antenna outdoor CPE (B3368), a CPE that can achieve peak rates of up to 1 Gbit/s. The B3368 combined with Huawei's advanced massive MIMO base stations leverages exclusive performance enhancing technologies to achieve three times higher service provisioning capability than other industry solutions and reduces the cost per line by 60%. This allows operators to maximize the value of their networks and provide broadband access services for more households and enterprises without adding more base stations.

## Fast deployment

Fast service provisioning: Traditional wired broadband services require several weeks, or even several months, to deploy, but WTTx services can be on air within a single day. Huawei offers the WTTx Suite commercial solution, the only one of its kind available in the industry, to help operators provide, manage, and remotely activate services. The B2368 is the industry's first full-band 4R CPE with a 360° adaptive omnidirectional high-gain antenna. The B2368 not only provides better signals but can also perform automatic optimization based on network conditions to achieve the best signal quality possible. This optimized CPE features simple installation and can be easily installed by the users themselves, improving service deployment efficiency. With the WTTx Suite and the B2368, WTTx services can be provided within a single day.

## Fast user growth:

WTTx offers broadband service via wireless connections. No trenches need to be dug, no cables need to be deployed underground, and no approvals need to be obtained from property owners. This helps operators rapidly increase the number of users.

## Less expensive O&M and higher investment efficiency:

Traditional wired broadband service provisioning requires on site testing and adjustment. Fault diagnose for these services requires dialing tests. Wired connections are prone to aging and physical damage. As a result, a lot of manpower is required to maintain the network, resulting in high O&M costs. However, WTTx provides unfettered wireless access, which helps to reduce overall O&M costs. Operators can take the money saved on O&M and use it to cover their CAPEX to improve ROI, or they can invest the spare man power in accelerating user growth and service provisioning, making their investments more efficient than ever.

## Flexibility, flexible speed on demand

There are several user segments requirements. Some of these users are price-sensitive and would rather get more data traffic at a lower cost. Other users are more sensitive to service experience and require high-quality broadband services. During wireless broadband development (since broadband users require high traffic), operators also consider to maintain the experience of mobile customers. The Wireless Fiber solution leverages wireless fiber broadband technologies, which promote network resource sharing. This solution helps operators provide prepaid and postpaid packages for different consumer segments to meet different user experience requirements. Prepaid packages unlock the enormous potential of broadband services in many developing countries. For example, in countries such as the Philippines, South Africa, and Sri Lanka, once prepaid packages were provided, the growth of WTTx users outpaced that of fixed broadband users.

## 5G-oriented evolution

As for network investment, operators need to pay attention to sustainable development of network architectures for the arrival of the imminent 5G era. Huawei's Wireless Fiber solution features an advanced architecture that allows operators to evolve from 4T4R/8T8R to massive MIMO based on their needs. The latest hardware platform also supports 5G NR hardware evolution, helping operators invest more efficiently. For the users, Huawei's exclusive CPE design supports smooth evolution to 5G CPEs with just an ODU replacement, quickly meeting user requirements for higher speeds.

Wang Qingwen, President of Huawei Wireless WTTx Product Line, commented, "Wireless technologies have witnessed remarkable development over the past few decades. Mobile voice services have been popularized around the world. Every household and every individual user can enjoy these services anywhere at any time. Huawei is committed to bring digital to every person, home, and organization for a fully connected, intelligent world. The Wireless Fiber solution will promote the development of the broadband connectivity and meet the requirements of Broadband speed upgrade in developed countries. This solution will also further accelerate the penetration of affordable HBB services in developing countries and bridge the digital divide for more homes."

# Huawei Launches ICT Training Center, Opens New Headquarters in Amman

Huawei Technologies Cooperatief/Jordan inaugurated its new headquarters in Amman and launched the Huawei Academy Jordan. The academy was launched to support Jordan as a regional platform for the development of human resources in the ICT sector, the Jordan News Agency, Petra, reported. The inauguration ceremony was attended by Minister of Labour Samir Murad, Minister of Industry, Trade and Supply Tareq Hammouri,

Minister of ICT Muthana Gharaibeh and Chinese Ambassador to Jordan Pan Weifang, as well as Huawei officials and senior executives. The Huawei Academy in Jordan is expected to offer over 3,000 students advanced ICT training over the next three years, in cooperation with several Jordanian universities and institutions. The academy will deliver training on state-of-the-art ICT technologies, encourage students to receive Huawei certification

and help trainees develop practical skills in the ICT industry. In 2016, His Majesty King Abdullah discussed the vital role of the ICT sector in Jordan with Huawei's deputy chairman and rotating CEO, Guo Ping. The ICT sector in Jordan offers investment incentives and capable human resources, which has made Jordan a regional hub in the field, King Abdullah said at the time. His Majesty commended the China-based multinational telecom company's role in developing the ICT sector in the Kingdom by establishing centres for training and planning, in addition to developing networks for the empowerment of entrepreneurs at the time. Ping commended the "Reach 2025" initiative which aims to help Jordan become similar to advanced countries in the field of ICT, which he said is also important for the national economy and society. During the meeting, he said that Huawei would provide support to enable the sector to keep up with developments and contribute to building smart cities. Huawei is a leading global provider of ICT infrastructure and smart devices. It launched its first office in Jordan in 2005 and provides telecom operators in the Kingdom with the latest requirements for the sector.

# Huawei Hosts ICT Job Fair in Saudi Arabia to Support Local Digital Transformation

Huawei, has co-launched an ICT (Information and Communications Technology) talent job fair with Saudi Arabian Ministry of Communications and Information Technology on Thursday in Saudi capital Riyadh. The event, providing more than 100 job vacancies to Saudi youth, aims to promote promising students who took part in previous Huawei training programs, and offer them an opportunity to develop their careers. Hundreds of students participated in the event, applying for the ICT jobs offered by Huawei and its 16 partner enterprises. Chinese Ambassador to Saudi Arabia Li Huaxin said, the job fair is yet another

example of China's strong partnership with Saudi Arabia, and a springboard for the young generation to enter the digital era. "I proudly recognize the contribution that Huawei has made through its social responsibility programs as it plays a major role in developing skills of the youth of the kingdom (Saudi Arabia)," Li added. Huawei also launched on the fair the Saudi Talent Enabling Program (STEP), an educational program that not only trains young Saudi ICT talents, but also develops the ecosystem for them and helps them find satisfying jobs. Hazem Bazan, vice president of Channels and Commercial Sales of Huawei Middle East, said that

Huawei, through its programs, supports the Saudi Vision 2030, which aims at building "an innovative and globally-competitive economy through digital transformation." "We are grateful to Huawei for its great contribution to accelerating our kingdom's digital transformation by equipping our students with the skills they need to drive forward the ICT industry. We look forward to continuing our collaboration and partnership in the upcoming years," said Saad Almaleki, general manager of Digital Capabilities at Saudi Ministry of Communications and Information Technology.

# Huawei Releases an AI Fabric White Paper

Huawei released AI Fabric, Intelligent and Lossless Data Center Network in the AI Era. The white paper presents the urgency and necessity of building an intelligent and lossless data center network by seizing AI opportunities to monetize data value. It elaborates on the unique technical advantages and customer benefits of using AI Fabric to build an intelligent and lossless network with zero packet loss, low latency, and high throughput. The release is a valuable reference for building next-generation data center networks. According to data analysis, 67 percent of CEOs among 2,000 cross-border companies have identified digitalization as the core of their strategies. Using AI to mine intelligence from the enormous amounts of data generated during digitalization is a common practice. Huawei's Global Industry Vision (GIV) predicts the AI procurement rate will reach 86 percent by 2025 — and leveraging AI to make decisions, reshape business models and ecosystems, and rebuild customer experiences will be a key driving force. AI is driving the transformation of ICT architecture. Storage mediums have transitioned from Hard Disk Drives (HDDs) to Solid-State Drives (SSDs), latency has been reduced by 100 times, and CPUs for data processing have become GPUs (or even dedicated AI chips), with a 100-fold computing performance improvement. Latency bottlenecks force the evolution of network communication from TCP/IP to Remote Direct Memory Access (RDMA). Distributed application architecture brings much collaboration between servers, and

N:1 traffic exchanges and large-byte data packets aggravate network congestion. The evolution of communication protocols and changes in application architecture not only call for network transformation, but also require intelligent scheduling and lossless forwarding to achieve zero packet loss, low latency, and high throughput for the intelligent and lossless data center network. At HUAWEI CONNECT 2018, Huawei launched the AI Fabric Intelligent and Lossless Data Center NetworkSolution to help customers build RDMA networks that are compatible with traditional Ethernet networks. This solution provides optimal performance with zero packet loss, low latency, and high throughput for data centers. The white paper describes Huawei's AI Fabric algorithm innovation in terms of congestion management and traffic control. One network carries three types of traffic: LAN, SAN, and IPC. According to the EANTC, a third-party independent test institute in Europe, Huawei's AI Fabric can effectively reduce

the communication duration between HPC nodes by as much as 40 percent, greatly improving efficiency of innovative services such as AI training. "The popularity of the RDMA network is becoming a trend, and it has been deployed in some leading Internet enterprises," Huawei Data Center Network Domain General Manager Leon Wang said. "The intelligent and lossless data center network has become one of the transformation directions of the network in the AI era. Huawei's AI Fabric is an innovative solution in the AI era. It accelerates data computing and storage efficiency, and brings dozens of folds of ROI to enterprises." Huawei's AI Fabric has been successfully put into commercial use in leading enterprises such as the Internet and finance. It helps an Internet enterprise improve AI training efficiency and accelerate the commercial use of autonomous driving. AI Fabric helps China Merchants Bank improve cloud storage performance by 20 percent, and leads the retail banking 3.0 era.
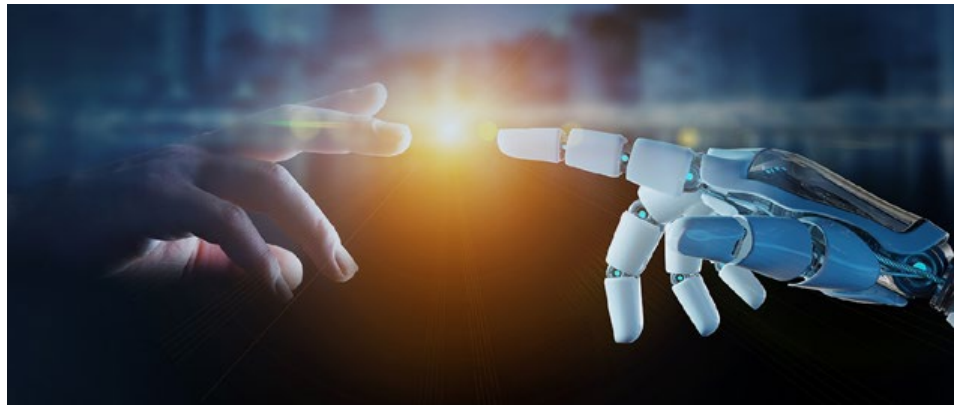


# Huawei Launches Flagship Experience Store in Pakistan

Just as the year comes to an end, Huawei has launched its Flagship Experience Store in Lucky One Mall Karachi, Pakistan. This is the first store of its kind that has been opened in Pakistan with Karachi being the first city to have the honor. Huawei flagship experience store will offer all of Huawei's products to interested customers

such as Huawei wearable tech such as smart watches, Huawei Smartphones including the latest flagship Mate 20 Pro, Laptops and other accessories. As per Huawei, this is the first of its kind Huawei store in Pakistan. The store is based on state-of-the-art infrastructure and can accommodate many customers at once.

Customers seeking to ask questions will be facilitated and they will also be able to experience the products first hand. You can also purchase the newest Huawei mate 20 Pro at this shop for around 160,000 PKR. Moreover, there are also some special offers for customers who choose to buy certain Huawei products from this store.

# Huawei Releases Industry's First Data Center Switch Built for the AI Era

Huawei unveiled the industry's first data center switch built for the Artificial Intelligence (AI) era −− CloudEngine 16800, at its network product launch event for Spring 2019 themed "A CloudEngine Built for the AI Era". Huawei defines three characteristics of data center switches in the AI era: embedded AI chip, 48-port 400GE line card per slot, and the capability to evolve to the autonomous driving network, and innovatively incorporates AI technologies into data center switches. The pervasive use of AI will help customers accelerate intelligent transformation. According to Huawei's Global Industry Vision (GIV) 2025, the AI adoption rate will increase from 16% in 2015 to 86% in 2025. The capability of leveraging AI to reshape business models, make decisions, and improve customer experiences will become a key driving force. Kevin Hu, President of Huawei Network Product Line, said, "A fully connected, intelligent world is fast approaching. Data centers become the core of the new infrastructures such as 5G and AI. Huawei will first introduce AI technology to data center switches, leading data center networks from the cloud era to the AI era." With the advent of the AI era, the AI computing power is affected by the performance of data center networks, which is becoming a key bottleneck of the AI commercial process.

On a traditional Ethernet, the AI computing power of data centers can only reach up to 50 percent due to a packet loss rate of 1‰. At the same time, the industry expects that the annual volume of data worldwide will increase from 10 zettabytes in 2018 to 180 zettabytes (180 billion terabytes) in 2025. Existing 100GE data center networks will be unable to handle the predicted data flood. In addition, traditional manual O&M methods will be unable to meet requirements as the number of data center servers continues to increase and the computing network, storage network, and data network become converged. It is therefore imperative that innovative technologies be developed and introduced to improve the intelligent O&M capability. "The data center switch built for the AI era has three characteristics," said Kevin Hu, namely "embedded AI chip, 48-port 400GE line card per slot, and the capability to evolve to the autonomous driving network." Industry's first data center switch with an embedded AI chip, reaching an AI computing power of 100% The CloudEngine 16800, the first data center switch in the industry to leverage the power of an embedded high-performance AI chip, uses the innovative iLossless algorithm to implement auto-sensing and auto-optimization of the traffic model, thereby realizing lower latency and higher throughput based

on zero packet loss. The CloudEngine 16800 overcomes the computing power limitations caused by packet loss on the traditional Ethernet, increasing the AI computing power from 50 percent to 100 percent and improving the data storage Input/Output Operations Per Second (IOPS) by 30 percent. The CloudEngine 16800 boasts an upgraded hardware switching platform, and with its orthogonal architecture, overcomes multiple technical challenges such as high-speed signal transmission, heat dissipation, and power supply. It provides the industry's highest density 48-port 400GE line card per slot and the industry's largest 768-port 400GE switching capacity (five times the industry average), meeting the traffic multiplication requirements in the AI era. In addition, the power consumption per bit is reduced by 50%, ensuring greener operation. The CloudEngine 16800 is embedded with an AI chip, greatly enhancing the intelligence level of devices deployed at the network edge and enabling the switch to implement local inference and rapid decision-making in real time. With CloudEngine 16800's local intelligence and the centralized network analyzer FabricInsight, the distributed AI O&M architecture identifies faults in seconds and automatically locates the faults in minutes, helping to accelerate the advent of autonomous driving network. Furthermore, this architecture greatly improves the flexibility and deployability of O&M systems. Leon Wang, General Manager of Huawei Data Center Network Domain, said, "Huawei CloudEngine series data center switches have been successfully launched into commercial use for more than 6000 customers, helping digital transformation of industry customers such as finance, Internet, and carrier customers. Huawei launched the CloudEngine 16800 to help customers accelerate intelligent transformation, achieve pervasive use of AI, and jointly build a fully connected and intelligent world."

# Huawei Takes the Lead in Completing China's 5G Technology R&D Trial Using 2.6GHz Spectrum

Recently, Huawei completed the 5G NR (New Radio) test at 2.6GHz spectrum in the 5G trial organized by the IMT-2020 (5G) Promotion Group. To date Huawei officially completed the third phase of China 5G Technology R&D (Research and Development) Trial including laboratory and field testing in NSA (Non-Stand Alone) and SA (Stand Alone) scenarios. The most mainstream NR frequency bands, including the 3.5GHz and 4.9GHz that have been tested earlier, and 2.6GHz that has just been tested, demonstrate the powerful support capability of Huawei 5G gNB. This 2.6GHz test was conducted in Huairou 5G test field and CAICT (China Academy of Information and Communications Technology) MTNet (Mobile Communication Trial Simulation Network) Lab using Huawei's latest 5G Massive MIMO 64T64R gNB. For 2T4R 5G terminals, the single-user downlink peak throughput exceeded 1.8Gbps. The successful verification of Huawei's 2.6GHz NR gNB fully proves that 2.6GHz can be one of the excellent choices for operators to deploy 5G NSA/SA commercial network. It also shows Huawei's strong determination to accelerate the development of 2.6GHz industry together with industry. Currently, 2.6GHz with large bandwidth is abundant spectrum resource around the world, but not fully used in many areas. Huawei has accumulated years of research and development on Massive MIMO and self-developed antennas in the 2.6GHz frequency band. In the 5G era, Huawei wakens the accumulated advantages with great power. Based on large bandwidth,

flexible Numerology, Massive MIMO, and narrow-beam scanning technologies are used in 5G products. Therefore, both the vertical coverage and horizontal coverage are much better than that of 4G, and capacity is greatly improved. Huawei 2.6GHz NR gNB products and solutions activate large bandwidth advantages ,farther, lay a solid foundation for the current and even future experience competitiveness of 2.6GHz spectrum. Yang Chaobin, president of Huawei's 5G product line, said: "In the early stage of 5G network deployment, C-Band and 2.6GHz are undoubtedly the most mainstream frequency bands. The C-Band industry chain is gradually becoming mature under the joint efforts of all of us. Similarly, the industry chain of 2.6GHz needs to be promoted together. Huawei has completed the full testing of C-Band and 2.6GHz in China's 5G Technology R&D Trial, which demonstrates the strength

of Huawei's end-to-end 5G products and solutions, and is also a Huawei's substantial action for accelerating the maturity of the 5G industry chain." In the past three years, Huawei has conducted a large number of 5G NR verification tasks under the organization of the IMT-2020(5G) Promotion Group in China. The lab and field tests of all 5G Sub6GHz mainstream frequency bands have been completed. The network performance in the NSA and SA architectures is greatly improved compared with 4G network. The test results are valuable for the global 5G tests and commercial deployment. In 2019, Huawei will continue to conduct extensive 5G trials with the IMT-2020 (5G) Promotion Group, including VoNR (Voice over New Radio), and terminal chip IOT (Interoperability test), prepare for 5G commercial trials and commercial scale in 2020.



# Nokia Working with Italy's Open Fiber to Deploy Rural FTTH

Italian wholesale network operator Open Fiber has selected Nokia to deploy fiber-to-the-home (FTTH) equipment in small towns and rural areas. The vendor says it will 'deliver products, services and software needed to plan, design, deploy and support the end-to-end active network infrastructure based on GPON

technologies'. Users will be able to access services at speeds of up to 1Gbps. State-backed Open Fiber was the winner of three government tenders to roll out infrastructure to bridge the digital divide in rural areas of Italy. There has been speculation that its network assets could be merged with those of Telecom Italia

(TIM) to create a single national broadband infrastructure. Italian economy minister Giovanni Tria told Reuters this week that a single telecoms network would be more efficient, and the government would like favor any plan to merge the two sets of infrastructure.

# Nokia Completes the Sale of its IP Video Business

Nokia has just completed the sale of its IP video business to the Canadian Volaris Group where the technology and the media business will continue life within a "pure play streaming technology company, Velocix." Nokia says the money raised will go to lower its debt. Terms were not disclosed. Nokia is divesting pretty much its full video product portfolio: the caching and streaming products, storage technology, and stream personalization software will all form an independent business within Volaris Group's Communications & Media portfolio. This is not news: the divestment was announced in September but it's worth taking a moment to digest Nokia's business model adjustment here. Like its major rival, Ericsson, Nokia has effectively trimmed its ambition and abandoned ideas of becoming a major and lead supplier of video kit and accompanying applications to both telco customers and 'adjacencies' . Yes, Nokia is going to stay in the game with a minority shareholding and it will "become a Global Channel Partner for Velocix, enabling [Nokia] to continue to sell and support Velocix video solutions (to Sky for instance, which is an existing customer)."

Nokia will also keep bits of the video unit and the existing integration business to support existing customers, but there's no disguising that it's a retreat and a major one. Video and its various associated applications (AR/VR, for instance) are, by all surveys and projections, the dominant and growing traffic type on the internet and with 5G arriving on the horizon, will become ever more dominant. Surely the telcos will be able to claim a big slice of the video streaming infrastructure pie? And with that ambition the likes of Nokia and Ericsson could play a supporting technology role? It appears not. The opportunity is presumably being - or about to be - snatched by the Web-scalers. Along with 'Cloud', where AT&T has just announced a similar retreat (see - AT&T closes sale of data center colocation operations and assets to Brookfield Infrastructure). Video looks as though it's been either tackled too late, in the wrong way, or with not enough push behind it. Perhaps a mixture of all three. And it's not as if Nokia, via its Alcatel assets, hadn't been full of optimism just a year or two ago. In April 2017 it was demonstrating

"skim storage" said to allow TV and video providers to serve programming to time-shifted viewers more effectively with lower broadcast lag. That followed hot on the heels of an announcement that it was providing Velocix CDN to Sky "to temporarily cache content closer to customers in localized cloud data centers to reduce transportation costs and improve the customer experience." Further back, in 2016, it had high hopes for virtual reality and was producing applications to complement its OZO VR camera, including live VR broadcasting, 3D stitching, and a VR player software development kit (SDK). Taken together its activities shouted one thing: networked video was where it was at and Nokia and its assets were going to play a winning game. Nokia may have another strategy for video streaming support up its sleeve, but that looks unlikely in the immediate term. In the meantime Nokia needs to husband its resources and narrow its efforts to concentrate on getting a good slice of the 5G market as telcos up their spend.

# Nokia Names Sandra D. Motley as President of Fixed Networks Business Group

Nokia has named Sandra D. Motley as President of its Fixed Networks Business Group effective January 1, 2019. She will report to Nokia President and CEO Rajeev Suri. Motley will succeed Federico Guillén, who as previously announced has been named President of Customer Operations, EMEA & APAC effective January 1, 2019. "Sandy is an exceptional leader with comprehensive executive management background across global business functions, and she brings business acumen, strong customer relationship skills, and proven success in leading cross-functional teams to deliver on challenging

business and operational objectives. I am pleased that she has accepted this role," said Nokia President and Chief Executive Officer Rajeev Suri. Motley is a seasoned telecommunications professional with leadership experience spanning business development, sales, marketing, research, product development, portfolio management and strategy. She started her career at AT&T Bell Laboratories, held a range of R&D and sales leadership positions at Alcatel-Lucent in both fixed and wireless businesses, and then joined Nokia in 2016. At Alcatel-Lucent, her roles included leading sales for U.S. wireless

accounts and serving as Chief Operating Officer (COO) for that company's wireless business, where she was responsible for R&D, Quality and Operational functions. After becoming part of Nokia, Motley oversaw end-to-end solutions for the North America market, and most recently, she has held the role of COO for the Fixed Networks business group. Motley holds MS and BS degrees in Mechanical Engineering from S.U.N.Y. at Buffalo and received an MBA in Finance from Fairleigh Dickinson University.

## Fiber in Water Pipe Technology

Oman Broadband, a state-owned open network infrastructure provider, always seeks to find practical solutions to provide high-speed Internet services to all regions of the Sultanate with high quality in line with international standards. The technology development department within Oman Broadband is always on the hunt for latest technologies to assist in the delivery of FTTH service efficiently. Recently in collaboration with an Omani SME, Swift Beam, provided Atlantis Hidrotiec technology manufactured exclusively by CRALEY Group Limited, which allows the installation of fiber optic through water pipes without the need for excavations, that has the greatest impact on: -



- Reduction of excavation work in the homes of customers to almost zero. Thus, reducing the presence of installation workers in the customers' home.
- Better utilization of available resources.
- Reduction of fiber installation time.
- Reduction of noise and disturbance.

The fibre-in-water pipe technology is based on the insertion of a small diameter tube inside the emergency tanker pipe, which is used to fill the water tank by water tankers from the outer wall of the house to the roof of the house - or anywhere else that makes it easy to reach the house - where the small tube is used to pass the fiber optic cable to the desired point from the roof to the inside of the house.

On Monday, December 26, 2018, for the first time in the Middle East, the technology was used to deliver Awaser 1GB internet package to one home in Al Hail North.

Engineer Bader bin Saud Al Zaidi, V. P of Technology and Commercial Affairs. commented Oman Broadband is always seeking innovative solutions that can provide the best solutions and practices used to serve customers. We hope that this technology (if it is adopted) will enable the speed of connecting subscribers in a

record time while reducing noise and noise compared to the conventional methods. This is a great inconvenience to the user during the delivery process. I would like to thank the Water Authority for their response and support for the success of this experiment. As one of the innovative solutions for delivering broadband services to homes.

Ahmed Al Waili house owner said: " I would like to extend my gratitude to the Oman Broadband for using the technology in my home, that I noticed has reduced the time of internet connection and I am very proud to be the first customer in the Middle East to be served by this technology.

Commenting on the experience, Ahmed Bin Saeed Al Rawahi, Swift Beam Technology Manager, said: "We are delighted with the value added to Oman broadband connection mechanism, which is result of a strategic partnership between the public and private sectors because of its importance in enhancing local capabilities. "The keenness of the Oman Broadband Company to develop and improve the mechanisms of home connection process is the most important motive for us in the search process and to find the best global solutions and use them locally to improve the quality of provided services."

## PCCW Global Partners TierPoint for Software-Defined Interconnection Offering

PCCW Global has agreed a partnership with data center and cloud firm TierPoint to offer US-based enterprises access to what they claim is the world's first software-defined interconnection platform. The collaboration between PCCW Global, which is the international operating arm of HKT, and TierPoint leverages the latter's data center infrastructure alongside PCCW Global's Console Connect platform. Console Connect offers enterprises a platform that makes easy-to-manage and secure

connections to cloud-based applications, partners, and client IT infrastructure. It also offers seamless access to a number of the world's major cloud providers such as Amazon Web Services, Microsoft Azure, Google Cloud, IB, Alibaba Cloud and Tencent. The partnership will see Console Connect initially made available at TierPoint facilities in Andover, MA, Bethlehem, PA, and Durham, NC, meaning TierPoint's data center tenants can also utilize PCCW Global's Tier 1 IP network, which spans more than

150 countries worldwide. Tony Rossabi, chief revenue officer at TierPoint, said: "A growing number of companies are seeking more reliable and secure alternatives to the public Internet for cloud connectivity. This new collaboration with PCCW Global helps address that need, further expanding the options available to clients in our leading, edge-capable facilities." TierPoint's customers will be able to provision on-demand direct access to business critical applications through Console Con-

nect, which can also connect all points in a network to automation software, helping to remove some of the complexities of network configuration. The offering leverages PCCW Global's Console Connect platform, which it acquired in a deal at the end of 2017. The deal, announced in November 2017, saw PCCW Global acquire Console Connect's brand, platform and technology team, but its network assets and customer contracts were hived off and put under separate ownership under the name IX Reach. Paul Gampe, who was previously CTO of Console Connect, has also become CTO of PCCW Global. According to PCCW Global CEO Marc Halbfinger (pictured), who spoke to Capacity in our December/January issue, Console Connect is now enabled at more than 70 of PCCW Global's data center locations. It is on-net in over 33 countries across four continents, he added. On the TierPoint partnership, Halbfinger said: "The various Console Connect points of presence in TierPoint's data centers will deliver simple and dynamic access to applications by pairing network and cloud more easily."



## PCCW Media Secures the Exclusive Broadcast Rights for Premier League from 2019/20 to 2021/22F

PCCW Media is pleased to announce it has secured the exclusive rights of Premier League for the broadcast of the 2019/20 to 2021/22 Premier League seasons in Hong Kong. Now TV continues to be the exclusive licensed broadcaster in Hong Kong delivering live coverage of all 380 matches, bringing viewers exciting live action throughout the season. Committing to providing viewers with the best viewing experience with the highest quality, a total of 76 matches will be delivered in 4K per season through the Now One set-top box. Now TV customers can also enjoy matches on-the-go via the Now Player app or relive their favorite matches using Now TV's Video-on-Demand service. Ms. Janice Lee, Managing Director of PCCW Media Group, said, "We are pleased to extend our long-time partnership with Premier League for the coming three seasons exclusively in Hong Kong. PCCW Media has once again acquired all rights to the live Premier League matches with pay-TV, free TV and OTT rights. Being Hong Kong's home of sports, the continued broadcast of the Premier League and the introduction of matches live in 4K reaffirmed our commitment to bringing the world's best sports actions to our customers." Mr. Paul Molnar, Director of Broadcasting, Premier League, said, "We know that Hong Kong has many passionate fans of the Premier League and our clubs, and that PCCW Media does an excellent job making the competition available to them. We are very pleased to continue our partnership with PCCW Media and look forward to working with them for the next three seasons." Together with the top European leagues and other major leagues currently available, Now TV customers can enjoy more than 1,600 of the world's top football matches in a season. Now TV continues to bring the most comprehensive football coverage with expert analysis and Cantonese commentary to audience in Hong Kong, offering viewers unprecedented enjoyment in watching the most popular football leagues on one platform. PCCW Media is pleased to announce it has secured the exclusive rights of Premier League for the broadcast of the 2019/20 to 2021/22 Premier League seasons in Hong Kong. Now TV continues to be the exclusive licensed broadcaster in Hong Kong delivering live coverage of all 380 matches, bringing viewers exciting live action throughout the season. Committing to providing viewers with the best viewing experience with the highest quality, a total of 76 matches will be delivered in 4K per season through the Now One set-top box. Now TV customers can also enjoy matches on-the-go via the Now Player app or relive

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# Tech Mahindra to Fuel Digital Growth in Bangladesh

Tech Mahindra, a leading provider of digital transformation, consulting and business re-engineering services, which already has a considerable presence in the Bangladesh IT industry, will fuel digital growth in Bangladesh across government and private sectors. Tech Mahindra plans to address the growing business opportunities that have come up with the booming IT market in the country through its innovative next generation technology solutions and service offerings. Tech Mahindra currently offers a diverse range of professional services to clients in the Telecom and BFSI (Banking, Financial Services and Insurance) space in Bangladesh and is also running large scale operations in the financial inclusion space. As part of its expansion strategy, Tech Mahindra aims to focus on generating new revenue streams through digital transformation projects in both Government as well as private sector across various industries with focus on ICT (Information and Communications Technology) & government business. Sujit Baksi, President, Corporate Affairs, Tech Mahindra, said, "Driven by strong domestic demand and macroeconomic stability, Bangladesh has emerged as one of the most buoyant economies of the SAARC region. Adding fuel to that fire, is the rapidly growing communication landscape that has thrived with increased Internet connectivity, smart mobility and rise of digital media. We at Tech Mahindra, are bullish on the strong growth potential of this market and hope to leverage our digital expertise in pushing forward the "Digital Bangladesh

mandate." "Creating jobs, boosting investments, diversifying exports and building human capital will be the key focus areas for the Bangladesh economy to sustain itself in the coming years. We look forward to collaborate with the country in its pursuit of a 'Developed Bangladesh' agenda and we hope to forge formidable partnerships with local businesses in the region to nurture and utilize local talent pool to make the most of this opportunity," he further added. With a sustained GDP (Gross Domestic Product) growth rate of more than 7%, rising per capita income and improved social indicators, Bangladesh has become one of Asia's most remarkable success stories in recent years. With over 9% increase in GDP growth rate forecasted in the next five years, Bangladesh's dynamic and growing economy, booming IT market and strategic location next to India, China and the ASEAN markets, provides the perfect opportunity for Tech Mahindra

to expand its operations in the country, as well as generate revenues from the SAARC region. As part of the TechMNxt charter, Tech Mahindra aims to leverage its global expertise in the use of cutting-edge digital technologies such as Blockchain, 5G – Telecom of the Future, Artificial Intelligence, Automation, Robotics, and Internet of Things to develop solutions that cater to the rapid evolving needs of the consumers in Bangladesh. Tech Mahindra already has a sizable presence in Bangladesh along with its subsidiary, Mahindra Comviva, which has an extensive portfolio spanning mobile finance, content, infotainment, messaging and mobile data solutions. As part of the USD 21 billion Mahindra Group - a major player in the Bangladesh market across various sectors since the past 20 years - Tech Mahindra aims to leverage the footprints of its parent organization to scale up its operations in the country.

# VIVA Bahrain announces the launch of its Innovation Center

VIVA Bahrain announces the launch of its Innovation Center – showcasing breakthrough technologies to support the government's vision of digital transformation while enabling businesses and customers to leverage next-generation solutions and services. Located within the headquarters in Seef district, the VIVA Innovation Center is a platform for developing solutions in modern technologies for various business verticals as well as an innovation think hub. With its continuous investments in best in-class solutions, providing an evolving portfolio of business solutions, VIVA's Innovation Center will showcase technologies such as physical and cyber security, smart, managed and modular data centers, automation in hospitality, remote e-learning and smart healthcare, smart office set-up and applications combined with latest enhancements to transport and fleet management services. In addition, the facility features interactive demo areas that showcase VIVA's extensive array of innovative solutions and services that can be tailored to the needs of business and consumers. Announcing the opening of the VIVA Innovation Center, Mr. Ulaiyan Al Wetaid, VIVA Bahrain CEO said, "Technological innovation is key to VIVA's corporate strategy and this will be the focus of our facility to showcase our proactive nature in ICT capabilities, supporting innovation across the country and Bahrain's business sector. With the launch of our innovation center, businesses will have the opportunity to visit and experience VIVA's ICT portfolio in the most up-to-date technology and in real-time." VIVA Bahrain's services have been key digital enablers for other sectors within Bahrain's economy and with technology as part of its DNA, the telecom operator continues to develop the most agile network and infrastructure to enable customers to meet their business objectives.

# Zain, Saudi Telecom Ink Deal to Provide FTTH Broadband Services

Mobile Telecommunications Company Saudi Arabia (Zain Saudi) has inked a memorandum of understanding (MoU) with Saudi Telecom Co. (STC) to extend fiber to the home (FTTH) broadband services to households across the Kingdom. Zain Saudi will capitalize on STC's infrastructure to deploy the FTTH broadband services, the telco said in a statement. Earlier this month, Zain Saudi signed two agreements with Dawiyat Integrated Telecommunications & Information Technology Co. to extend high-speed fiber to the home (FTTH) broadband services to households and deploy telecommunication services in enterprise sector companies, Argaam reported.

# Zain Saudi Arabia Signs FTTH Provision Deal with Integrated Dawiyat

Zain Saudi Arabia has signed two new agreements with Integrated Dawiyat, a subsidiary of Saudi Electricity Company (SEC). One is for provision of broadband services in new cities and neighborhoods, and the second agreement for the supply of telecommunications services to the business sector. Under the deal, Dawiyat and Zain KSA will provide FTTH service for a second launch to residential customers in the cities of Riyadh, Dammam, Jeddah and Medina, thus serving another 101,678 households.

## ARTICLE

# eSIMs in Handsets - The Next Big Disruption

The eSIM technology is the latest advancement in Subscriber Identity Module (SIM) technology. It is a global specification by the GSMA which enables remote SIM provisioning of any device that supports this technology. The embedded Subscriber Identity Module, commonly referred to as eSIM, allows end users to store multiple profiles on a device simultaneously, and switch between them remotely, without having to physically carry SIM cards. Because it is embedded within the mobile device, the eSIM cannot be removed easily.

**An ecosystem of trusted platforms and players has been facilitated by the GSMA to create the eSIM solution. It offers an equivalent level of security and protection to that provided by the removable SIM card. By having a programmable SIM card for networked devices, they can be connected, managed and controlled remotely for end users.**

According to ABI Research, over 400 million eSIM smartphones, including the already available Apple XR, XS and XS Max e-SIM supported devices, will enter the global market by 2022.

**How does it work?**
Although the role of SIM technology isn't changing with the introduction of eSIM, and that the SIM's functionality aspects remain the same, the way in which it is used will change dramatically.

To enable this change, an ecosystem of trusted platforms and players has been facilitated by the GSMA to create the eSIM solution. It offers an equivalent level of security and protection to that provided by the removable SIM card. By having a programmable SIM card for networked devices, they can be connected, managed and controlled remotely for end users.

**What are the benefits for consumers?**
eSIM enables remote SIM provisioning for e-SIM supported devices.

**Saleem AlBlooshi**
Chief Infrastructure Officer
Emirates Integrated Telecommunications
Company (EITC)

**Beyond the consumer segments, eSIM technology has advantages that extend to new business models through different implementations for Internet of Things (IoT) and Machine-to-machine (M2M) solutions for enterprise devices.**

For consumers, this means they can use different phone numbers for separate voice or data plans, all on one device. If they travel abroad, they will be able to switch to a local carrier that supports eSIM and access that operators network remotely.

Consumers will appreciate the simplified user experience and benefit from eSIM, such as shorter time required to connect a device to a network, simplified handling and more reliability, since the eSIM is embedded in the device itself. Having an embedded SIM also minimizes the risk of SIM damage, allows more room within the phone for other purposes, and will ultimately mean that future developments of mobile devices will become slimmer as well as enable enhanced connectivity.

Beyond the consumer segments, eSIM technology has advantages that extend to new business models through different implementations for Internet of Things (IoT) and Machine-to-machine (M2M) solutions for enterprise devices.

eSIM enables Mobile Network Operators (MNOs) to offer subscriptions to millions of new devices without the existing SIM card logistics, and to improve the customer experience with "immediate" connectivity for their new device. Device Vendors can manufacture devices with a single generic eSIM that can be delivered and connected

anywhere in the world. Service Providers can simply and remotely change the subscription profile.

According to Ericsson close to 29 billion connected devices are expected to be in use by 2022, with around 18 billion related to IoT. This will add convenience through cost reduction for logistics and minimises the need for handling of legacy SIM cards. This also opens up new use cases for remote device management and will become more and more beneficial to many industrial sectors as 5G cellular mobile communications reach deployment in the GCC.

**What are we doing around eSIM?**
As a recent report into the future of eSIM, from Oliver Wyman, indicates, "the eSIM era has arrived and is here to stay". Illustrating this further, the forecast number of connected objects "range anywhere from 25 billion to 75 billion connected devices by 2020".

In the UAE, EITC has brought this technology to life for both consumer and enterprise segments in partnership with Munich-based Giesecke+Devrient Mobile Security, by using its AirOn eSIM Management Solution. This technology has brought the next evolution of SIM technology closer to customers and means that EITC is better equipped to allow remote subscription provisioning of eSIM subscriptions to eSIM devices based on AirOn remote SIM Management Solution. To avail of du's eSIM solutions, all consumers need to do is to request a change from physical to eSIM at their nearest du store or request a new mobile connection through a du store or online if they are new to the operator.

**What are the key challenges for its implementation?**
M2M eSIM solutions will present key challenges for end users, especially enterprise applications, as the level of connectivity needed to power the millions of eSIM that will be enabled connections

in coming years could lag behind the growth in eSIM popularity. According to a report from Accenture, companies in the US are projected to spend upwards of US $275 billion to revamp infrastructure to handle the increase in network speed and connectivity. The full deployment of 5G cellular mobile communications will facilitate this challenge and is expected to rapidly transform the number of M2M use cases as networks become faster and more powerful.

**In the UAE, EITC has brought this technology to life for both consumer and enterprise segments in partnership with Munich-based Giesecke+Devrient Mobile Security, by using its AirOn eSIM Management Solution. This technology has brought the next evolution of SIM technology closer to customers and means that EITC is better equipped to allow remote subscription provisioning of eSIM subscriptions to eSIM devices based on AirOn remote SIM Management Solution.**

Thankfully, an ecosystem of trusted platforms and players has been facilitated by the GSMA to create consumer and enterprise eSIM solutions. These will provide a global network of eSIM enablers and operators with a mandate within the framework of GSMA which will create global standards for eSIM rollout to avoid individual solution disorganizing the global eSIM market.

## REGIONAL NEWS

# Digital Transformation Spending in the Middle East, Turkey & Africa to Top US$25 Billion in 2019

Overall spending on information and communication technology (ICT) in the Middle East, Turkey, and Africa (META) is set to grow 2.5% year on year in 2019 to reach US$213 billion. That's according to the latest insights presented today by International Data Corporation (IDC) as it hosted 200 of the region's most influential technology vendors, telecommunications operators, and IT service providers at the Address Dubai Marina hotel for its annual ICT industry gathering, 'IDC Directions'. Running under the theme 'Multiplied Innovation: Scaling a Technology Revolution in the Middle East, Turkey, and Africa', the highly anticipated event explored the emerging trends and priorities that will shape ICT investment in 2019 and beyond, with IDC's group vice president and regional managing director for the META region, Jyoti Lalchandani, highlighting the critical role that digital transformation (DX) initiatives will play in driving ICT investment across the region. "Developing an effective digital transformation platform that can sustain, advance, and scale business operations may be the most important task facing the region's decision makers," said Lalchandani as he opened the day's proceedings. "We expect DX spending across the META region to cross the US$25 billion mark in 2019 and that figure is only going to increase over the coming years as more and more organizations experiment with transformative technologies such as robotics, artificial intelligence (AI), and the Internet of Things in a bid to spur innovation and revolutionize their

customer experience." IDC's senior vice president and chief analyst, Frank Gens, built on this during the event's keynote address as he presented his outlook for the global ICT industry and highlighted the radical changes we can expect to see as organizations strive to broaden the scale of their innovation and accelerate the responsiveness of their operations. "In the next two years, the proportion of digitally determined organizations with a fully integrated enterprise-wide technology architecture will grow from 34% to nearly 90%," he said. "By 2022, 25% of endpoint devices and systems worldwide will be executing AI algorithms, and between 2018 and 2023, more than 500 million new apps will be created, equaling the total that was built during the preceding 40 years." The event also featured a session hosted by Nenad Pacek, founder and president of MEA Business Group, that explored the region's economic outlook, while a panel of senior IDC country heads dissected

and contextualized the technology-led innovation and entrepreneurship that is taking root in a variety of different geographies across the region. This was complemented by a series of individually themed technology tracks that enabled attendees to further tailor the agenda to meet their specific areas of interest. Bringing the event to a close, IDC's associate vice president for research in the META region, hosted an executive panel session featuring insights from Abdulaziz Alfalahi, CEO of corporate technology support services at Dubai's Roads and Transport Authority (RTA), and Khaled Khamis Al Mansori, CISO of Abu Dhabi's Department of Energy. Together, they examined the emerging priorities that are shaping the CxO growth agenda of tomorrow, with a particular focus on the challenges end-user organizations will encounter as they strive to strike an effective balance between traditional systems and next-generation technologies.



# Exchange of Internet Traffic inside Iran Hits 800 Gbit/s

The exchange of Internet traffic inside Iran has increased from 263 Gbit/s since June 2017 to 800 Gbit/s in January 2019, making up 50% of the country's total Internet traffic, ICT Deputy Minister Hamid Fattahi

said. He maintained that the increase in the Internet traffic exchange is thanks to services rendered to users on the National Information Network in the format of video and online transport services. Fattahi also

announced the inauguration of a project to increase the country's IP network to a capacity of 18.5Tb/s in the near future.

# Digital Innovation Boosts Middle East's US$650 Million Startup Market

As the Middle East and North Africa's startup market nears USD 650 million, global social entrepreneurship organization Ashoka, global technology company SAP, and members of the World Economic Forum's Global Shapers Community have joined forces to drive dialogue and action with social entrepreneurs during the recent Global Entrepreneurship Week 2018 in Bahrain. The Middle East and North Africa's digital startup ecosystem is rapidly growing, with funding reaching USD 650 million from 270 deals in 2017, according to a recent report by ArabNet and Dubai SME. During the recent ChangemakerXchange Talks and Actions at the University of

Bahrain and Brinc Batelco IoT Hub, six startup leaders presented, inspired, and empowered young people and social entrepreneurs to embark and scale their startup journeys. The event was part of a larger effort to celebrate entrepreneurship during Global Entrepreneurship Week 2018, promoted by Tamkeen. "Strong turnout at the ChangemakerXchange Talks and Actions shows Middle East entrepreneurs are global leaders in using technology to make a social impact," said Batoul Husseini, Director of Corporate Social Responsibility, SAP MENA. "By fostering connections, learning, and collaboration, SAP and Ashoka are helping startups to



scale, exchange best practices, and foster social change." Leveraging the power of technology – including artificial intelligence and machine learning, blockchain, cloud, and the Internet of Things – was a main topic of discussion. Lana Al Attar, Founder of Bahrain's Gudjuju digital agency with a conscious, talked on "Using Technology to Empower Good." Saad Hamid, the CEO of Pakistani digital consultancy DEMO and founder of the SkillsFirst digital skills bootcamp, presented on "What Does Opportunity Mean in a Digital World?". Reaching new levels of funding was also highlighted. Ammar Shawoosh, a Saudi Arabian entrepreneur and consultant, presented on "Five Lessons to Leverage Your Competitive Advantage." Ameen Hadeed, the CEO of Iraqi medical startup Pharx, presented "The Journey: From Survival to Entrepreneurship." Attendees eagerly heard about how entrepreneurs have overcome personal challenges. Nour El Assaad, the Founder and President of the Lebanese anti-bullying nonprofit No Label NGO, presented on "The Power of Self-Learning and Perseverance." Yostina Boules, the Founder of waste-to-electricity startup Taqa Solutions in Egypt, presented on "Women in Tech." While exploring the potential of harnessing technology for social change, the social entrepreneurs also took time to deepen their bond on a human level and to cultivate their wellbeing. These are important practices to sustain their motivation and becoming more effective in their work as change makers.

# Super-Fast WiFi Rolls Out in UAE

Millions of passengers at Abu Dhabi Airport will now have access to the fastest WiFi connection in the world. Abu Dhabi Airports on Sunday announced its airport-wide 'Super-Fi' connection that will increase internet upload and download speeds to a maximum of 200 mbps per user. According to airport officials, the super-fast internet connection will be available throughout the

three terminals. Internet access will be free for public use across the terminals of Abu Dhabi Airport – a move that comes as part of the operator's commitment to enhance passenger experiences. In a statement, Abu Dhabi Airports' chief executive officer, Bryan Thompson, said: "We understand just how important WiFi has become to the travelling public. At Abu Dhabi

Airports, we value our customers first and foremost, placing a primary focus on their experiences while coming and going from the UAE's capital. "Access to fast internet is a crucial factor that makes a big difference for our travelers. Providing our customers with enhanced connectively services is in line with our vision of becoming the world's leading airports group."

# GCC Telecom Operators Lead Regional Peers

The Arabian Gulf's telecommunications companies lead the Middle East and North Africa's operators on the back of GCC consumers' spending power, economic diversification and investment into advanced technologies. The UAE, at the forefront of the region, is the most attractive telecoms market in the Middle East and North Africa region, due to "its strong combination of high rewards and low risks," according to a new Fitch Solutions report. The Arab world's second largest economy, where Etisalat and du are focused on post-paid and company subscribers scored 56.3 out of 100 points, compared with the regional average of 44.2, in a Fitch index.

"The UAE remains the most attractive telecoms market in the MENA region, Fitch said."In the face of limited organic growth opportunities (and) with the penetration rate reaching very high in the third quarter of 2018, (UAE) operators Etisalat and du are focusing on high value post-paid and enterprise subscriptions while shedding inactive prepaid subscriptions." The UAE is followed by Saudi Arabia, biggest Arab economy, which declined by 0.1 point due to a slightly lower country risk score. Bahrain in third place and Oman in sixth have not seen their scores change this quarter. A high penetration rate and a decline in mobile subscribers led to Kuwait

coming in fifth place. Gulf telcos are focused on digitalization of the industry and the integration of 5G services - which are poised to include rapid data transfer rate, energy saving, cost reduction and widespread device connectivity through Internet of Things. Operators in the UAE alone stand to gain an additional US$3.3 billion (Dh12.1bn) in revenues by 2026 from the digitalization of industries, according to Swedish technology company Ericsson - which works with leading telecom operators such as du, Etisalat and Kuwait's Zain Group in the Arabian Gulf region. Morocco jumped two notches up to seventh place thanks to an improved economic outlook this year. The North African country's mobile market is expected to stay positive in the medium- and long term, as operators remain focused on expanding 4G services and attracting post-paid subscribers. Iraq, ranked eighth in the index, has witnessed a sustained growth of mobile subscriptions with the restoration of services in the western and northern parts of the country, according to Fitch. Lebanon, one of the most expensive countries in the world for mobile use, ranked 14th in the index and is "held back by low mobile growth prospects in the near future." Syria, Yemen and Libya trail their regional peers at the bottom of the index.

# Mobile, Internet Penetration Nears 100% in 2018 in Saudi Arabia

Penetration for mobile phones and the use of the internet has neared 100% among families in Saudi Arabia in 2018, data released showed. Mobile phone use reached 99.16% in 2018, the General Authority for Statistics (GASTAT) revealed after conducting a survey on families and individuals in the kingdom, indicating that such a level of penetration confirms the kingdom's transformation. Around 75.19% of individuals of varying ages said they used a mobile phone, while 92.66% of people aged 12 to 65 said they used mobiles in 2018. Around 26.68% of people

of various ages said they used a computer, while 33.16% of people aged 12 to 65 said they used them in 2018, according to GASTAT's survey. As for the internet, the report showed that 89.77% of families had internet access, particularly through long-term evolution (LTE) connections. Of this figure, 68.82% of families said they used internet using mobile data plans, while 33.01% used a portable modem. Over 91% of people in Saudi Arabia said they used the internet at least one per day, while 5.61% said they used it once a week. Survey respondents said that social media

topped the reasons they accessed the internet, followed by gaming sites.

# TRA Bahrain Launches Video Call Service for its Consumer Call Center

As part of its keenness to better serve all society segments including deaf and people with hearing impairment and based on its belief that the telecommunications technology should be utilized to foster communication with all subscribers, the Telecommunication Regulatory Authority (TRA) has launched a video call service for its Consumer Call Center: 81188 at the end of November 2018 in cooperation with Silah Gulf, a company specializes in contact center services and external outsourcing. The new feature will allow any android user to initiate a video call directly to TRA's Consumer Call Center: 81188 to submit their complaints and enquiries. The initiative comes in response to the message recently launched by Omar Farooq in social networking accounts "I am deaf", which included the challenges faced by the deaf and people with hearing impairment in the society. The initiative also comes in implementation of the outputs and proposals of the ITU Plenipotentiary Conference recently held in the UAE for the Resolution on Telecommunication & Communication Technology Accessibility for Persons with Specific Needs, and it also comes in complementation of the recent consumer rights introduced in the TRA's Consumer Protection Regulation. "TRA stresses on its significant duties and powers to protect the interests and rights of telecommunications subscribers in the Kingdom of Bahrain and places a great importance to those people with special needs, especially with regard to their rights as consumers in the telecommunications sector, by continuing expanding and enhancing the communication channels between

TRA and the all consumer segments and improve the level of services provided to them." said TRA Acting General Director Sh. Nasser Bin Mohamed Al Khalifa. The TRA's Consumer Call Center 81188 receives consumer complaints and enquiries during official working hours from Sunday to Thursday from 8:00 am to 4:00 pm.



# Data Consumption on the Rise in Bangladesh

Data consumption in the country increased by 34 percent in the July-November period of the current fiscal year (2018-19) due to growing use of internet for individual and business purposes. Besides, flourishing of local contents and online-centric services also helped attract more internet users and bandwidth usage accordingly, said market experts. They also said increased online activities by the users in the run-up to the December 30 national polls were another reason for the rise in data consumption in the country in the period. According to Bangladesh Telecommunication Regulatory Commission data, international internet bandwidth consumption increased by 228 gigabits per second to 900Gbps at the end of November, 2018 from 672Gbps in June. Bandwidth consumption by the country's internet users was 411Gbps in June, 2017. In June, 2016, country's total international bandwidth consumption was 265Gbps while it was 186Gbps in December, 2016 and only 8Gbps in 2009. As per the BTRC's latest data, people used

9.18 crore connections through mobile and broadband internet as of November, 2018. Of the connections, 93.68 per cent or 8.6 crore were given by the mobile phone operators and the rest 6.32 per cent or 57.78 lakh were given by the broadband internet service providers. The number of internet users in the country was 7.33 crore at the end of June, 2017. Although the mobile operators have the maximum number of internet connections, they are using around 35 per cent bandwidth of the country's total consumption, said a senior official of Internet Service Provider Association Bangladesh. International terrestrial cable (ITC) service providers, which provide bandwidth to the mobile and broadband internet service providers, have capacity to provide 960Gbps of bandwidth against the total demand for around 900Gbps in the country, an official of an ITC service provider said. Of the total data usage in Bangladesh, state-owned Bangladesh Submarine Cable Company Limited provides 65 per cent bandwidth,

Summit Communications provides 18 per cent and Fiber @ Home Global provides 15 per cent bandwidth to the internet users. Besides the entities, Novocom, Mango Teleservices, BD Link Communication and 1Asia Alliance Communication meet the rest 2 per cent demand. The lone state-owned submarine cable company has already got connected with the second cable which also supplies a huge quantity of bandwidth, the official said. Initially, the capacity of the cable was 200Gbps of bandwidth but it has the capacity to provide up to 1,500Gbps of bandwidth. The country currently receives 200Gbps of bandwidth from its first connection, SEA-ME-WE 4. BSCCL got connected with the cable in 2016. It got connected with the second submarine cable in 2018. Bangladesh joined the consortium in March, 2014 at a cost of Tk 660 crore. Besides providing bandwidth to the local subscribers, BSCCL also exports 10Gbps bandwidth to seven northern states of India.

# Oman TRA, PDO Ink Pact to Fund Training of 200 Job Seekers

As per government's directives to support SMEs and provide job opportunities to Omani youth, the Telecommunications Regulatory Authority (TRA) has signed a Memorandum of Understanding (MoU) with Petroleum Development Oman (PDO) to train 200 job seekers for two years. The program will guide the trainees to set up businesses in the telecommunications sector. This initiative aims to Omanise jobs in the last mile connectivity (LMC) services, which are now occupied by untrained non-Omanis which contributes to unemployment levels among Omanis. Additionally, the number of



companies offering services has created an unhealthy competition by lowering prices beyond a sustainable level for well-established businesses to survive. Also, there has been very little regulation in the LMC sector, which has affected the quality of services provided. Dr Hamed al Rawahi, Executive President of TRA, stressed, "The LMC program is a great example of the way we should look to work in the ICT sector projects as we move towards the future of Oman. This is a program that is designed and developed by Omanis, for the benefit of Omanis." Raoul Restucci, Managing Director of PDO, said, "We are determined to sustain our efforts to create employment and business opportunities for job seekers in a variety of economic sectors including telecommunications. By joining forces with trusted partners, such as the TRA, we aim not only to create job opportunities for young Omanis, but also to equip them with the tools and skill sets which will empower them to start their own businesses." Omar al Qatabi, Chairman of the project steering committee, said, "This project is very ambitious as it would open new opportunities for many SMEs in the telecom industry directly with the licensed operators and would open the opportunity for job seekers." The first phase of the project started in early 2018, in which, several concerned stakeholders including the telecom operators, Oman Development Bank, the National Business Centre, Riyada, and others worked jointly to develop a strategic framework and governance policies to regulate LMC services and to accelerate national development of Omanis.

# Vianet to Deploy FTTH Broadband Network across Nepal

Vianet, an Internet Service Provider (ISP) in Nepal, will deploy a Fiber-To-The-Home (FTTH) broadband network across Nepal to connect more than 200,000 customers. Vianet will be deploying over 100,000 of Nokia's GPON Optical Network Terminals (ONTs). Nokia's GPON fiber solution will help Vianet to build up to 2.5 Gbps capable network for subscribers – enabling them to access Internet applications such as 4k video content, Internet TV, live streaming, online gaming, etc. The FTTH broadband network will provide existing Vianet subscribers with the option to upgrade their current bandwidth up to 100Mbps. Nepal has 1,006,285 ADSL broadband customers and 2,192,687 cable / FTTH broadband customers as of September 2018, according to Nepal Telecom Authority. In addition, there are 283,894 Wi-Fi broadband customers, 87,152 WiMax broadband customers, 10,132,289 3G broadband customers and 2,060,750 4G broadband customers in Nepal. Vianet said it will be expanding the new fiber network beyond the metropolitan area of Kathmandu and address rural areas across Nepal, Binay Bohra, managing director of Vianet. "Customers will be able to enjoy high bandwidth applications

without any network-related problems. It will also lead to increased consumption of broadband thus helping Vianet to add to its revenue," Vinish Bawa, head of emerging business for the India and Nepal Markets at Nokia, said.

# Saudi CEOs Voice out Their Thoughts on the Kingdom's ICT Sector

Business leaders in Saudi Arabia view technological disruption as an opportunity rather than a threat with plans to continue investing in emerging technologies, such as blockchain, Internet of Things (IoT) and data analytics over the next three years, according to the Saudi Arabia CEO Outlook – a report published by KPMG Al Fozan & Partners. The report outlines the results of the annual survey that was released recently, where 50 CEOs in Saudi Arabia were asked how technology was affecting their business. "CEOs views on disruptive technologies continues to gain more prominence, increasing from 95 percent in 2017 to 100 percent in 2018, which reconfirms their belief that technological disruption is an opportunity to grow their business rather than a threat," said Dr. Samer Abdallah, the Head of Digital at KPMG in Saudi Arabia. In pursuit of their growth objectives, majority of the CEOs in Saudi Arabia (more than 60 percent) believe in four key action items that they intend to undertake — selling online, joining technology related industry consortia, partnering with cloud technology providers and increasing investments in disruption detection and innovation processes. The survey results showed that 58 percent of the CEOs in Saudi Arabia are taking personal ownership of digital transformation to provide customized customer experiences. Besides, 80 percent of CEOs believe that they are either meeting or exceeding their customer expectations. More than half the CEOs (52 percent) said they are actively disrupting the sector in which they operate rather than waiting to be disrupted by competitors. The majority of the CEOs in Saudi Arabia (58 percent) are prepared to lead their organization through a radical transformation of their business and operating model. CEOs in Saudi Arabia are optimistic about investing in emerging technologies for their businesses overall growth and transformation. The vast majority (more than 90 percent) expects a significant return on investment (ROI) from artificial intelligence and robotics process automation, although only in the long run, within the next five years. Ninety-six percent of CEOs are already either piloting of implementing artificial intelligence (AI) in a small number of processes, mostly for the automation purpose. With several strategic challenges, changing customer demands and technological advancements in the economy, CEOs (72 percent) consider agility as the new currency of business. CEOs believe that agility can be achieved by focusing on third-party partnerships. Along with agility, CEOs in Saudi Arabia (8 out of 10) also rely more on their experiences and intuition rather than data analysis or computer-driven models, while making strategic decisions. "Easy access to business model enablers such as Cloud Computing has led to emerging technologies becoming disruptive on a large scale. Hence, it is imperative that CEOs adopt emerging technologies, such as artificial intelligence (AI), 3D printing, advanced robotics, IoT and augmented reality (AR), quickly as they become foundational tools for businesses," stated Dr. Abdallah. "Companies have greater access to platforms, processing power, software and data to turn emerging technologies into useful, scalable solutions. Most industries around the world have seen disruption in some shape or form, primarily due to digital transformation," Dr. Abdallah concluded.

# Egypt to Replace 95% of Its Copper Network with Fiber Optics Cable by 2020

Ahmed Zidane, the deputy spokesperson of Egypt's communication and IT committee, revealed that by 2020, the government would replace 95% of its copper telecom network, which is now 60% replaced, with fiber optics cable. By modernizing its internet network, Egypt wants to improve its broadband internet penetration rate that was 43.3% in 2015. In 2019, the government plans to reach 53.5 % ; the aim being to greatly improve the population's access to internet. For Egypt, that is making the internet a driver for future growth, improving the population's internet access is a pre-requisite for the emergence of a digital economy. To meet its goal, which is to cover the whole country with optical fiber and at a minimal cost, Egypt will benefit from the expertise of the optical fiber cable manufacturing plant inaugurated by the authorities in March 2018. Installed in the industrial town of Badr, in the northeast, this $30 million investment is the result of a partnership between the Egyptian HitekNofal Solutions and the Chinese Hengtong Group.

# UAE Consumers Are Amongst the Most Connected Technologically
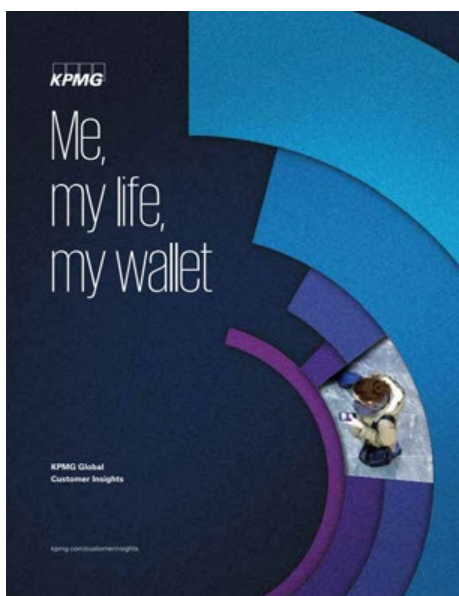


UAE consumers are increasingly relying on technology and have a growing desire to be connected, with 67 percent stating that they see value in harnessing the power of technology. This is according to the findings of the UAE edition of a new study by KPMG International, titled Me, my life, my wallet. The report analyses factors driving consumer behavior and choices in the UAE — and how these could change as the customer of tomorrow emerges. Almost half of all UAE consumers interviewed were impressed with how much a smartphone could help them manage their schedules. With 97 percent receiving their news online and 93 percent on social media, this level of enthusiasm for digital world innovation was beaten only by the smartphone-crazy consumers of China and India. Interestingly, despite recent global data breaches, 78 percent of UAE consumers feel comfortable sharing their data with retailers and other institutions, but they would be more likely to do so if they saw tangible value. When asked about trading their data for personalization or better deals, UAE consumers were midway between the privacy-conscious Europeans and the more carefree consumers in China or India, with 22 percent saying they would not trade their data at all. Globally, more than half of consumers expressed anxiety about identity theft, including hacking of financial, medical, or other personal information online; 46 percent were concerned about the theft of credit card details when shopping online; and 38 percent were concerned about the unauthorized tracking of their online habits by companies, governments, and criminals. The study found that consumers are more likely to trust companies with the data that is directly relevant to the service they are providing. For example, 71 percent of global consumers said that they trust banks with their financial data, but only nine percent said they would trust retailers with this information. Likewise, 47 percent of consumers trust telecom providers with their mobile data, but only eight percent said that they would trust advertisers. In the UAE, sectors that enjoyed the highest level of trust among consumers were healthcare (63 percent), banking (52 percent), retail (51 percent) and technology firms (38 percent), while the least trusted was advertising at 15 percent. Farhan Syed, Partner, Digital and Innovation at KPMG Lower Gulf, said: "Today's consumers grow more complex with every passing day — and there is a greater need to understand them more intimately. This is putting more pressure on brands to deliver increasingly personalized experiences in today's hyper-connected and informed world. We believe that there is a tremendous need to understand consumers' expectations, especially regarding their data, and it is imperative that organizations do not take this for granted in the future." Meanwhile, as the UAE consumer grows accustomed to a seamless physical retail experience, enjoying some of the world's most iconic malls, matching this experience in the digital world is proving to be tough but necessary if consumers are to switch to spending more online. "The challenge now for e-commerce platforms is to provide a population that is accustomed to superb offline customer experiences the same online experience," added Pilar De Miguel Veira, Partner, and Head of Customer Advisory at KPMG Lower Gulf. "This will help UAE strengthen its position as a leading regional e-commerce hub in the future".

# Funds Required Towards ICTs for NGOs in Libya

A global network of organizations working to provide shared communications services in humanitarian emergencies requires US$2,4 million to provide lifesaving telecommunications services to the humanitarian agencies in Libya. The Emergency Telecommunications Cluster (ETC) requires the funds to cover the provision of internet connectivity services, an information and communications technology (ICT) helpdesk and facilitate emergency communications systems that are minimum operating security standards (MOSS)-compliant. ETC has so far received $550 000 from the United Nations Central Emergency Response Fund (CERF) to establish some services in the new hub in the northern Benghazi, Libya's second-most populous city after the capital Tripoli. Teams are exploring options to implement Services for Communities (S4C) projects. ETC S4C Adviser conducted a mission to Tunis in November to explore ways to implement a complaint feedback mechanism, such as a call center. Libya is in crisis eight years after civil unrest erupted during the so-called Arab Spring. Provision of lifesaving telecommunications services to the response community in operational areas is set to enhance the overall response and ensure assistance is efficiently provided to people most in need. The humanitarian footprint in Libya is expanding, with an international humanitarian presence in many locations throughout the country. Most agencies are in the process of establishing a presence in Tripoli and elsewhere.

# Mobile Broadband Widespread Adoption Fosters Digital Financial Services in Pakistan

The account ownership in Pakistan has witnessed a reasonable increase and crossed around 39 million which was 15 million at end of 2015. This increase has been significantly contributed by branchless/mobile banking accounts and account ownership in the country has increased to 22 per cent from 13 per cent in 2014. It is important to highlight that since biometric verification of mobile connections in 2015, more than 23.5 million new branchless banking accounts were added in market. The rapid and widespread adoption of mobile phones and mobile broadband technology with over 62 million mobile broadband subscribers in Pakistan has not only created a solid base for digital transactions but is also resulting in new and innovative business models that deliver financial services at lower prices and with broader customer reach. According to Pakistan Telecommunication Authority (PTA) report under bank-led model, authorized financial institutions, cellular mobile operators and technology firms have improved their financial services and necessary infrastructure by developing user friendly and real time solutions. These players are capitalizing on the technological advancements to bring disruption across distribution channels and product lines. The financial and telecom regulators have also extended continuous support to the Digital Financial Service (DFS) growth in the country by providing enabling environment through improved policies, laws and regulations according to changing market dynamics. The scope of alternate delivery channels and technologies has been expanded to include 3g and 4gspectrum for providing branchless banking services. The relevant regulations have allowed opening of basic level remote m-wallet accounts to promote usage of financial services among all segments of society. The SBP has issued 11 branchless banking and three Payment Service Providers licenses to various players. PTA and SBP have already issued first joint license for interoperability solutions and more are in the process. The above mentioned DFS ecosystem has

provided a reasonable base for uptake of digital financial services in the country. According to Finance Survey 2015, 23 per cent adult population has access to formal financial institutions compared to only 12 per cent in 2008. The report further said despite above mentioned improvements over the years, we are well short of DFS growth potential available through over 153 million biometrically verified mobile connections across the country. In order to tap this potential, our DFS ecosystem needs to evolve to a state where consumers and businesses feel comfortable to leave their funds in digital form rather than cash. First step towards this direction is delivery of bulk payments including Government to Person (G2P) and Business to Person (B2P) through mobile wallet accounts. Payments through these wallet accounts should be acceptable and as easy as paying cash at the merchants' outlets. However, consumers do not keep their funds in digital wallets and mostly use cash as they do not find utility in keeping their funds digital, due to lack of convenient options to use those funds for day to day transactions. The government has initiated delivery of Benazir Income Support Program (BISP) payments through wallet accounts which is the biggest program of poverty alleviation in Pakistan. Many other

G2P payments can be channelized through mobile wallets. Secondly, payments across different channels should be ubiquitous and interoperable for consumers, wherein, anyone can transfer money to anyone through any channel. In this direction, PTA and SBP have initiated joint licensing for interoperability of digital financial services under any-to-any model, however lot more efforts are required to accomplish large scale interoperability. Thirdly, delivery of additional services including savings, insurances, investments and loans through digital wallets can be an enabler to achieve long term financial inclusion targets and sustainability of the digital financial services in the country. For the overall success, development of consumers' trust in digital technologies is crucial and realizing critical role of information technology in banking industry, the financial and telecom regulators have been pushing financial and telecom industries to upgrade and transform their systems for digital age. Various initiatives for the implementation of electronic payment channels in the country have been taken that include development of strong legal and regulatory framework such as SBP's branchless banking regulations 2008 (upgraded in 2011 &2016).

# GCC Online Hiring Leaps 30%

Online hiring in the GCC registered a 30 per cent increase during the third quarter of 2018, mainly due to efforts by governments to diversify their economies. According to the latest whitepaper research by Monster Gulf, despite experiencing a slight decline from the first and second quarters of 2018, online recruitment demand in the GCC has been steadily increasing on a quarterly basis since the fourth quarter of 2017. The International Monetary Fund recently raised the economic forecasts of all GCC countries for 2018 and 2019, and, in its latest World Economic Outlook report, estimates that the UAE's fiscal position is predicted to strengthen by 2.9 per cent. Saudi Arabia and Kuwait are expected to grow by over 2.3 per cent each in 2018. Bahrain, which recently received US$10 billion in financial aid from neighboring GCC



states, is projected to record a 3.5 per cent increase in GDP growth by the end of this year. "The growing online hiring trends experienced across the GCC region can be largely attributed to the various reforms and stimulus packages being rolled out by regional governments to advance the non-oil sector. Furthermore, we are now seeing structural reforms across the GCC, as opposed to revenue injections, which underlines the regions' determination to taper off its oil dependency and achieve long-term economic sustainability. Economic and market diversification will play a significant role in the continued recovery of the GCC," said Abhijeet Murkherjee, CEO of Monster for the Apac and Gulf. Reforms designed to promote the private sector, such as the introduction of long-term visas for professionals and easier licensing requirements for new businesses, will catalyze market competitiveness and job demand, he added. The technology sector is the top hiring industry of 2018, with a 40 per cent growth from the same period last year. This coincides with recent announcements of smart city projects across the region - including Sharjah's US$6.5 billion Aljada Smart City Project and Kuwait's eco-friendly Saad Al Abdullah City Project - which have generated job demand within the technology sector. "The high demand for technology professionals is no surprise given the rapid digital transformation of the GCC in recent years and the recent announcements of smart city megaprojects," Murkherjee added. "Furthermore, customer demands are evolving putting pressure on businesses to offer more digitalized services and creating opportunities for IT professionals. Given these developments, it will be interesting to see how the GCC job market will react next year. Although it may be slow, the road ahead appears to be positive and we can feel optimistic for 2019 as we prepare for a busy and vibrant 2020."

# Communication Balloons to Be Launched Across Iran

Emergency communication balloons will be launched in various Iranian provinces within the next year, said the Director of Space Transportation Research Institute. Rahim Ehsani said a new plan to design and produce at least 20 communication balloons is about to be implemented, to provide the country with communication and monitoring services in emergency conditions. "The project is part of a lager plan called Space Ship, which aims at enabling communication, monitoring and photography applications," he was quoted as saying in an interview with ISNA. According to Ehsani, the Space Ship project is accomplished within a new mission named "Stratospheric Platform", which refers to a platform with a higher

height than planes and lower than space. Elaborating on the platform, he said there are two types of the platforms: fixed and changing. "In the earlier communication balloon project, each balloon was capable of carrying 50 km cargoes at 500 meter height." He noted the balloons offer WiFi services to the users and added that last year, during Arba'een pilgrimage, Iran deployed a balloon near its border with Iraq as part of a new project to provide free Wi-Fi internet service for the pilgrims. Arba'een services were offered after the balloon was successful tested in the quake-hit areas of the western province of Kermanshah. Ehsani said that at the order of Iran's Communication and Information Technology Ministry, all provinces across

the country are to be equipped with the communication balloons for emergency uses. "To this end, at least 20 balloons are set to be designed and produced within next year," he said. Elsewhere, Ehsani said, each balloon is capable of carrying 300kg cargos and covering a 10 to 15 km radius. "In the previous project, each balloon could offer services up to 5 km. But in the new project, the radius has increased to 15 km," he added. The official said Space Ship project is a strategic 10-year-old plan which is set to establish a space ship in a 20 km height in the next ten years. He noted that the ship can move to a 400 km height at a speed of 200 km/h.

# Sayada Inaugurates the First Decentralized, Free Wi-Fi Community Network in Tunisia

The Tunisian revolution brought the hope for a better system of internet governance – one that is participatory, democratic and open. Today, the town of Sayada is pioneering an open government initiative. Since 2013 – and with the support of the local municipal government – civic technologists inaugurated the first decentralized, free community Wi-Fi network in the country. This is part of a recent local government code that aims to decentralize the power of decision making and spending to the local level. Now, with the sharing of the Sayada community network experience, the country is in a strong position to make an open, free and resilient internet ecosystem a reality in the country. The challenges that Tunisia faces in increasing internet access, especially in rural areas, are significant. The country is ranked 65th out of 201 countries in terms of internet usage. The country has 5,472,618 internet users with a penetration rate of 48.1%. The number of people not connected to the internet is a little more than that, in the order of 5,902,602 people. Tunisia is ranked ahead of Algeria and Morocco, its nearest comparable neighbors, in terms of internet usage. Official statistics published by the Tunisian national telecommunications regulator in April 2016 indicate that there are 516,061 fixed data subscriptions and 7,280,197 mobile data subscriptions, with a penetration rate of 16.02% for fixed data and 64.5% for mobile data. Most Tunisians are using a 3G/4G connection with a bandwidth capacity of 180 Gb/s. Connecting 100% of the population is still a challenging issue and the focus of the government is to reach the unconnected people in the rural areas and households below the average income. The main factors related to increasing connectivity in rural areas are expanding infrastructure, ensuring affordability, increasing usability and developing innovative state policies. In this context, the coastal town of Sayada, some 140 km from Tunis and in the administrative governorate of Monastir, inaugurated the first free Wi-Fi community network in Tunisia in December 2013. The community, represented by students,

technology experts, civil society activists, policy makers and municipality officials, was helped by CLibre, a local association that aims to promote the culture of a free and open internet. Today, the Sayada community network – called "MeshSayada" – which covers 70% of the town, is a success story of a community-designed wireless network system. The community network also serves as a platform for locally hosted content, such as Wikipedia and OpenStreetMap, and will expand to include more locally created content. The network consists of 11 rooftop nodes (using 12 routers), including the cultural center, town hall and nine residences. The network links major areas of the town and covers the main streets, the weekly market, the train station and high schools. The routers have been placed in different interconnected nodes to have optimal coverage of the network, whether on the street or inside the houses. More than 15 Wi-Fi nodes were installed throughout the town via two unidirectional transmitters that have a diffusion angle of 60 degrees. Their range can reach two or three kilometers in a free zone without obstacles. The municipality of Mestir provided bandwidth for synchronization and proxy of sites to the community of local developers who synchronized the Sayada web portal with the Sayada Wikimedia site. Multistakeholder collaboration is critical to the project. On 13 November, 20 computer scientists and engineers came together in Sayada Cultural Centre with a group of 14 girls (10 to 14 years old) from the city of Mestir and Sousse, Sayada community members, people from nearby towns, and groups from across Tunisia to learn and contribute with different skills toward building the network. The Ubuntu Tunisia Association arrived from the neighboring city of Sousse on the second weekend to help set up the server and to create the network portal page. Local engineers, academics and technology experts focused on participatory network planning, site planning, and solving various technical challenges. Everyone put their skills to practice when installing two directional routers on the town hall and using the

router interfaces to test the mesh link distances to connect with battery-powered routers set up in the street. Fifty children came to attend the workshop. They later went home and explained MeshSayada to their parents. Several IT developers from around Tunisia volunteered to contribute by adding additional applications and content to the local network. The applications and content are installed in the network service. These include OpenStreetMap, Wikipedia in French and Arabic, a collection of 2,500 free books in French, an Etherpad application for collaborative document editing, and a Media Grid application for secure chat and file sharing. To consolidate the idea of inclusiveness and the bottom-up approach, a young developer created a local portal that links to each of these services, and that allows people to use easy-to-remember names such as Sayada.mesh or Wikipedia.mesh to access the local applications. The project cost the association and the town of Sayada no money. The equipment was provided entirely by the Open Technology Institute (OTI), a non-governmental organization that works on community network development to help strengthen the participation of residents through open government processes. Residents donated their time and effort to build the Sayada network. In terms of the network quality, it offers a useful user experience when accessing web pages, text chat and web-based maps. The challenge came when needing more bandwidth for intensive tasks, such as file sharing and video streaming. This would require additional work by local network administrators to optimize links and increase throughput. The bandwidth capacity performance declined between two-hop and three-hop connections. On average, the two-hop throughput was 2 Mbps, and the three-hop links averaged 1.8 Mbps. However, the links are of an acceptable quality given the nature of the content on the local server; for web pages, text chat and web-based maps, the throughput constraints over the network should not result in a degraded user experience.

# Bangladesh Launches 16 Major Digital Services in 2018

Access to Information (a2i) Bangladesh, with the support of the Information and Communications Technology (ICT) Division, USAID and UNDP Bangladesh, has introduced more than 16 digital services and platforms this year in line with its vision of transforming the country into digital Bangladesh. The a2i has introduced two online-based platforms − "Konnect" for students and "Accessible Dictionary" for visually-impaired people. Prime Minister inaugurated a2i's newly developed online-based platforms earlier in the year, reports BSS. The a2i in collaboration with the Department of Agriculture Extension has developed the digital platform "Krishi Batayon" (agriculture portal) and the "Krishak Bandhu Phone Seba" for the expansion of the e-agriculture services across the country, said the a2i officials. Any farmer included in the list of Krishi Batayon can ask any question related to agriculture by making a call to 3331. The a2i has also launched the "333 Call Centre" with a motto — "Government information and services, anytime" — to provide information on procedures of receiving government services and redress of social problems. Prime Minister's ICT Affairs Adviser Sajeeb Ahmed Wazed inaugurated the call center service on April 12, 2018. Anyone can dial the helpline 333 from anywhere of the country and expatriates Bangladeshis to 09666789333 and receive

information about government offices or officers, tourist attractions, districts, and solution to different social problems. The a2i introduced "Skills Portal" (skills.gov.bd) on September 22 in the first session of the National Apprenticeship Conference 2018 held in Cox's Bazar. The Skills Portal is an online platform for regular coordination and monitoring of various a2i skill-development programs; assessing the demand of skilled manpower in the industry; and connecting skill development organizations with various industries. The a2i Program and the Department of Environment launched two environment challenge funds titled "Effluent Treatment Plant (ETP) Monitoring System" and "Remote River Water Monitoring System" to check river pollution and wastes discharged by factories. The projects will protect the environment and rivers from pollution by providing information online on waste control and quality of river waters respectively. The government launched a mobile app "Joy" on July 29, in an attempt to provide immediate assistance to women and children who were already became or are about to be victims of torture or violence. Joy application software has been developed by the Multi-Sectoral Program on Violence Against Women (MSPVAW) of the Ministry of Women and Children Affairs with funding and technical support from the a2i Program. During any emergency,

the app user can instantly send urgent SMS to the superintendent of police and deputy commissioner of the metropolitan police, three selected FNF (friend and family) numbers and the National Helpline Centre (109). The a2i has also launched "E-Licensing and E-Learning System" for transforming services to e-services for saving time and reducing cost, and six digital centers aimed at ensuring easy, fast and low-cost access to government and private services for the RMG and fishery workers.

# A Roundup of Major Developments in Pakistan's Telecom Sector in 2018

2018 was a different year for the telecom sector with few key developments including expansion of 3G/4G mobile services, consistent growth in customer base and their utility of the services. Below are the few major developments of the telecom sector in 2018.

### Transition in Leadership
PTI's government along with its ally parties formed the government in the center. Dr Khalid Maqbool Siddiqui was appointed as the Minister of IT and Telecom. In 2018, the federal government also appointed Maj. Gen. (Retd) Amir Azeem Bajwa, Member Technical at Pakistan Telecommunication Authority, while Dr. Khawar Saddique

Khokhar was appointed as the Member Compliance. Amir Azeem Bajwa is likely to assume the office of PTA chairmanship.

### Consumers' Year of Tax Relief
Supreme Court of Pakistan made a landmark decision this year by abolishing the withholding tax of 12.5 percent on recharge using prepaid cards and bills for postpaid connections of mobile phone customers. This was a major relief for the public which used to pay heavy taxes to the government despite the fact that millions of customers belong to the low-income group and do not fall into the taxpaying category. Not only were the taxes removed but services charges of mobile phone

companies, which varied around 7 percent, were also waved off. The double relief ultimately increased the consumption of services and subsequently translated into economic activity.

### Operators' War to Attract Customers through Offers
Operators were at war in 2018 to attract the most number of subscribers with their packages and special offers. But they were cautious in their approach not to indulge in a cut-throat competition as they did in the past. Jazz introduced its lowest data package of Rs 999 in the market. Its rival, Zong did not revise down the price of its existing package but it did increase the

data limit of its packages. It revised the limit of its Rs. 1,500 package from 24 GB to 36 GB. Telenor offered a 50 percent discount offer on the price of its particular device. It also offered a higher data limit for the next couple of months on the purchase of different packages for its dongle. These sort of offers were seen from various companies to attract new customers and it worked well to meet the target in such a competitive environment.

**Telcos & Infrastructure Expansion**

Telecom operators expanded and upgraded their networks in 2018 to provide quality services and increase their coverage area. Zong claimed that it set up more than 10,000 towers exclusively for 4G services. Telenor Pakistan also claimed to upgrade its service to 4.5G at the end of this year. Ufone introduced its 38 self-service booths in 11 cities to facilitate its

customers through value-added services.

**DIRBS Launch**

PTA officially launched Device Identification, Registration and Blocking System (DIRBS) in May 2018, aimed at discouraging the use of smuggled and counterfeit handsets in the country. The authority issued its first deadline of October 20 to block handsets and then extended it to December. The implementation of the system was postponed to create awareness among public and traders of handsets.

**PTA's Initiatives**

PTA also launched a re-designed complaint management system in November 2018. The aim of the re-designed system was to provide ease to the general public in lodging online complaints through a user-friendly interface. The authority revealed its plan to launch 5G test trials in the country. In this regard, it issued a draft framework

for the development and testing of future technologies, especially for 5G wireless networks, in Pakistan.

**Failure of a Million Dollar Deal**

The million dollar deal between Jazz and Edotco failed. The deal could have brought an estimated FDI of $940 million. Under the deal, Edotco was to acquire 13,000 towers from Jazz, which are currently operated by Deodar Pvt Limited.

**Jazz-Warid Merger**

After nearly two years, Auditor General of Pakistan (AGP) termed the grant of Non-Objectionable Certificate (NoC) for the merger of Mobilink and Warid as unjustified. It raised serious questions over the merger between Jazz and Warid and this might lead to an inquiry against the stakeholders and policymakers in the future.

# Dubai's Smart City Ambitions Set to Hit New Milestone

Smart living is set to soon become a reality as telecoms operator du finalizes plans to deliver services at Silicon Park, Dubai's first integrated smart city project taking shape at Dubai Silicon Oasis. du said it has partnered with Orange Business Services, the business services arm of the Orange Group, to deliver a complete range of smart city services for Silicon Park that is set for completion by the end of March. Operationally, the main data center infrastructure is already up and running, and over a third of all services are now in various stages of implementation, a statement said. Smart solutions are designed to boost productivity and efficiency and includes a community portal, an energy management solution, an information and messaging hub and an enterprise architecture office. When fully operational, it is also expected to feature smart solutions from charging-docks for smart devices on the street to smart pop-up furniture and digital play tables, as well as optimally-designed bus shelters, piazzas shading, and electric vehicles charging stations. Silicon Park will comprise 71,000 sq m of office space, 25,000 sq m of commercial space, 46,000 sq m of residential area and the 115-key business hotel Radisson RED Dubai Silicon Oasis. It will also feature restaurants, cafés, prayer rooms, a shopping Centre and an underground parking space that can accommodate more than 2,500 cars. Farid Faraidooni, Deputy CEO, ICT Solutions, Emirates Integrated Telecommunications Company (EITC), said: "Smart City services constitute our biggest opportunity to enhance the UAE's position as a global hub for tourism, commerce and as a happy place to live. We are already engaged with Abu Dhabi, Ajman and other emirates in building

smart ecosystems in the UAE. "Silicon Park is among the most eagerly-anticipated smart living projects in the Middle East region and once delivered, it will act as a significant milestone in realizing the vision of Smart Dubai." Muammar Al Katheeri, executive vice president of Engineering and Smart City at Dubai Silicon Oasis Authority, added: "Silicon Park has been conceptualized to leverage smart technology that is central to its DNA. "Silicon Park is set to provide 60 smart services with an investment of AED100 million, in line with the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to transform Dubai into the smartest and happiest city in the world."

# OTC Signs Agreements to Build, Lease and Manage Telecom Towers

Oman Tower Company (OTC) has signed two pacts with Omantel and Ooredoo to build, lease and manage assets of towers in the sultanate. The signing ceremony was held under the patronage of Dr Hamad bin Salim al Rawahi, CEO of Telecommunications Regulatory Authority (TRA). Eng Majid bin Amer al Kharousi, CEO of OTC, Talal bin Said al Ma'amari, CEO

of Omantel and Jim Maxell, Acting CEO of Ooredoo, signed the pacts. Eng Kharousi said that the signing of the two memoranda of understanding for the construction of the towers is part of framing the government efforts to unify the infrastructure of inactive communications. He pointed out that the two memoranda are a gateway to key agreements to be signed in January 2019

according to all contractual conditions and other conditions. In a statement to Oman News Agency, Eng Kharousi said that the Oman Tower Company will build the towers to be leased to the two operators Omantel and Ooredoo, as well as the third operator when founded. Talal bin Said al Ma'amari, CEO of Omantel said that the Memorandum of Understanding signed with OTC, a specialized company in the operation, maintenance and management of communication towers, covers the technical issues of the infrastructure for the communication towers that will be provided by OTC for the current or the future mobile operators. In response to a question about the 5G, Ma'amari said that the technology is one of the development stages for the radio technologies which provide mobile communication services. 'It is known for providing new technologies that can contribute to providing infrastructure for the new technologies used in smart cities projects, the autonomous cars and other projects related to such technologies which require high speed networks.'

# Telecom Operators Add Over 4 Million New Broadband Users in Pakistan

The telecom operators providing broadband services in the country have added around 4.442 million new subscribers to their networks during 11 months of 2018. The number of broadband subscribers including mobile was 58.34 million till December 2017 which reached 62.77 million by November 2018, showing a reasonable growth. The indicators about broadband subscribers by technology issued by Pakistan Telecommunication Authority (PTA) showed that the DSL users reached 15,99,122 till November 2018 against 15,90,623 users in December 2017, showing only around 9,000 increase. The HFC users reached 60,783 till November 2018 against 61,479 users in December 2017, showing slightly decrease. The number of Wimax users which were 1,00,967 till December 2017 has decreased

to 81,796 till November 2018. The users of EvDO also witnessed decrease of almost 70,000, reaching 3,42,872 in November 2018 from 4,10,859 in December 2017. The Mobile broadband has registered major contribution in overall growth and reached 60.58 million by November 2018 from 56.1 million by December 2017. The number of 3G/4G/LTE fixed users increased to 25,892 till November 2018 from 23,551 by December 2017. The statistics further showed that Jazz's total count for 3g users stood at 14.069 million by November 2018, as compared to 14.83 million by December 2017. Jazz 4g users have jumped to 6.58 million by November 2018 from 4.3 million in December 2017. Zong 3G subscribers decreased to 8.669 million by November 2018 from 9.267 in December 2017while number of 4G users jumped from 7.35

million by December 2017 to 9.33 million by November2018. The number of 3G users of Telenor which were 10.51 million in December 2017 decreased to 9.323 million in November 2018. The number of its 4G users jumped from 3.1 million in December 2017 to 4.4 million by November 2018. Ufone added around 1.6 million new 3G users to its network during 11 months and reached 8.21 million by November 2018 from6.6 million in December 2017.

# Etisalat Launched 5G C-band Network as the First Regional Telecom Operator in May 2018

Etisalat was the first telecom operator in the region to provide ultra-high 5G C-band data speed as a commercial service over the wireless network in May 2018.

This was followed by the prestigious and global achievement of connecting and announcing Expo 2020 Dubai as the first major commercial customer in the Middle East, Africa and South Asia (MEASA) region to access 5G services. Etisalat connected Expo 2020 Dubai to its 5G network, the first World Expo to be connected on this network.

**Etisalat is now ready to launch 5G service for all consumers with its infrastructure and network ready to support all 5G devices to be launched by global mobile device manufacturers in 2019.**

Etisalat is now ready to launch 5G service for all consumers with its infrastructure and network ready to support all 5G devices to be launched by global mobile device manufacturers in 2019. With continuous investments in technology and innovation on the network, Etisalat's infrastructure can enable 5G connectivity today for all fixed and mobile devices expected to be launched in the first half of this year.

Expo 2020 Dubai was Etisalat's first major commercial customer in the Middle East, Africa and South Asia (MEASA) region to access 5G services. Etisalat connected Expo 2020 Dubai to its 5G network, the first World Expo to be connected on this network.

Saeed Al Zarouni, Senior Vice President, Mobile Networks, Etisalat said: "Etisalat's technical teams are building 600 5G sites to enable 5G coverage across the country. Our network and infrastructure will be ready to provide the service as soon as the 5G mobile handsets are available in UAE. Our management's strategy to focus on digital innovation and to 'Drive the digital future to empower societies' have led to investments in superior and state-of-the-art technology solutions on the network."

**Saeed Al Zarouni**
SVP/Planning Department
Etisalat

**With ultra-high speed and low latency services to the user 5G will enable users to enjoy uninterrupted 4K video streaming, best gaming experience, AR/VR services and autonomous transport. The 5G network will also empower government entities and the enterprise digital transformation, smart city development and the fourth industrial revolution.**

Al Zarouni added that 5G will radically change the lives of the subscribers in the country, he said: "With 5G technology consumers will witness maximum speed of 4.5Gbps and on 4G the maximum speed was upto 600Mbps. The network can now provide faster data connectivity combined with higher speed. The larger bandwidth will provide the capability to handle larger number of connections in any geographical area. With ultra-high speed and low latency services to the user 5G will enable

users to enjoy uninterrupted 4K video streaming, best gaming experience, AR/VR services and autonomous transport. The 5G network will also empower government entities and the enterprise digital transformation, smart city development and the fourth industrial revolution."

Etisalat successfully conducted a 5G trial with outdoor mobility at its headquarters in Abu Dhabi in 2018. The trial demonstrated 5G capabilities in a real world environment over a live network, including tests on speed, latency and beam steering. The 5G trial system used 800MHz of spectrum in the 15GHz band, demonstrated over 20 times greater performance than what was currently used in 4G networks. The trial also achieved an aggregate site throughput of more than 24Gbps a significant improvement over current 4G networks.

Another major milestone for Etisalat and the telecom industry was the launch of the first commercial 5G wireless network in the UAE becoming the first telecom operator in the Middle East and North Africa (MENA) region to achieve this technological milestone and set an industry benchmark. Etisalat was the first operator to have a fully developed commercial 5G network available to provide gigabit internet

services to its customers. The network will fuel enterprises digital transformation, IoT, smart cities and the fourth industrial revolution.

**Etisalat successfully conducted a 5G trial with outdoor mobility at its headquarters in Abu Dhabi in 2018. The trial demonstrated 5G capabilities in a real world environment over a live network, including tests on speed, latency and beam steering.**

In the first phase of the 5G launch, fixed wireless services and mobile services will be provided in selected locations in UAE, which will gradually expand to other parts of the country depending on consumer demand and requirements. The commercial fixed and mobile devices will be available for consumers in this phase. Etisalat was aiming to achieve a download speed of 5Gbps for wireless access and more than 1.5Gbps for CPE (customer premises equipment) devices.

## SATELLITE NEWS

# UAE Space Agency Discusses Space Sector's Contribution to Sustainability at ADSW 2019

The UAE Space Agency is to inspire youth to enter the space sector, support start-ups, make use of technology, and build human capacity. Abu Dhabi Sustainability Week (ADSW) 2019, held annually and hosted by Masdar, provided an opportunity for the UAE Space Agency to highlight its own role in remaining sustainable while participating in a number of space projects. "Sustainability is inextricably linked to technological advancement and the development of advanced skills," said His Excellency Dr. Ahmad Belhoul Al Falasi, Minister of State for Higher Education and Advanced Skills and Chairman of the UAE Space Agency, during the final day of the UAE Space Agency's participation in Abu Dhabi Sustainability Week (ADSW) 2019. Throughout the week-long event, the Agency showcased the space sector's significant contribution to sustainability and the development of diversified, knowledge-based economies. The UAE Space Agency played a key role at the 11th edition of ADSW. Influential delegates from the Agency were involved in panel discussions, networking lunches, start-up hubs, and award ceremonies. The Agency delegation was led by H.E. Dr. Ahmad Belhoul Al Falasi, and included: His Excellency Dr. Eng. Mohammed Al Ahbabi, Director General of the UAE Space Agency; Dr. Mohamed Al Junaibi, Executive Director of Space Sector; Dr. Khaled Al Hashmi, Director of Space Missions, Science and Technology; Sheikha Al Maskari, Chief Innovation Officer; Eng. Naser Al Rashedi, Director of National Space Policy and Regulation; Sumaya Al Hajiri, Head of Space Policy and Regulations, and other officials and engineers from the Agency. H.E. Dr. Al Falasi, participated in a panel entitled 'How investment in science drives the UAE's long term sustainable development' with Her Excellency Sarah Al Amiri, Minister of State for Advanced Sciences, and Her Excellency Mariam Al Mheiri, Minister of State for Food Security. H.E. Dr. Al Falasi stressed the important



**ABU DHABI SUSTAINABILITY WEEK**

**His Excellency Dr. Ahmad bin Abdullah Humaid Belhoul Al Falasi**
Minister of State Higher Education & Advanced Skills, Chairman UAE Space Agency

"Rapidly progressing innovation continues to change our approach to space technologies, bringing us closer to the global sustainability agenda"

role that youths play in sustainability, saying: "The next generation is integral to meeting the sustainability targets that are laid out in the United Nation's 2030 Agenda. Young people are innovative, passionate, creative and energetic. We need to harness and nurture these qualities with effective higher education and advanced skills programs." "The growth and development of the UAE's space sector will directly contribute to excellence in education and a diversified, knowledge-based economy – two of the key pillars on which the UAE Centennial Plan 2071, which was launched by H. H. Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE, is based," added H.E. Dr. Al Falasi. H.E. Dr. Eng. Mohammed Al Ahbabi, Director General of the UAE Space Agency, participated in a panel entitled 'Building Tomorrow's Workforce Today' with Erin Winick, Associate Editor of Future of Work at MIT Technology Review, and Dr. Steve Griffiths, Senior Vice President of Research and Development at Khalifa University. The panel was moderated by Cailin Birch, the Global Economist at the Economist Intelligence Unit. H.E. Dr. Eng. Al Ahbabi said, "The UAE Space Agency is the first established space agency in the region, and is the largest in terms of investment and number of satellites. We try to utilize space to inspire, attract, educate, and train young people. We

inspire the youth to pursue a STEM degree, as one of our mandates is to build human workforce capacity." ADSW also highlighted the significant role played by women in inspiring change and innovation, and their contribution to the development of a sustainable future. Sheikha Al Maskari, Chief Innovation Officer at UAE Space Agency, was a participant in the Women in Sustainability, Environment and Renewable Energy (WiSER) initiative at ADSW entitled 'The Role of Women in Advancing the United Nations' Sustainable Development Goals'. Al Maskari, along with her fellow participants, discussed how women can play a larger role through education, entrepreneurship and innovation, finance and policy, and culture/changing behavior, to advance the UN Sustainable Development Goals. The panelists discussed the challenges that young people face in the space industry and stressed that the only way to face these challenges is by being passionate about space. This panel also highlighted the important role that the UAE leadership plays in supporting the space sector and encouraging young people to enter the industry. Finally, the panelists discussed the eclectic fields that space involves, which include, but are not limited to, engineering, physics, chemistry, biology, and astronomy.

# Satellogic with China Will Launch 90 Earth-Observation Satellites ... Remap Earth at 1-Meter Pixel Each Week

An international space venture called Satellogic says it will have 90 satellites launched by a Chinese company to create an Earth-observing constellation. China's Long March 6 rocket lifts off from the Taiyuan Satellite Launch Center in 2017.  The first launch by the China Great Wall Industry Corp. under the newly announced deal, scheduled for later this year, will deliver 13 satellites to low Earth orbit on China's Long March 6 rocket, Satellogic said today in a news release. Satellogic's constellation seems likely to compete with the remote-imaging satellite constellations operated by San Francisco-based Planet and Seattle-based BlackSky. The company promises to remap Earth at 1-meter pixel resolution every week and dramatically reduce the cost of high-frequency geospatial analytics. "We want to help solve the world's most pressing problems by building an accurate and up-to-date picture of our planet and the many forces that reshape it every day," Satellogic founder and CEO Emiliano Kargieman said. "This agreement is a major step in realizing that vision." Financial terms of the deal were not disclosed. China Great Wall was established in 1980 with authorization from the Chinese government to provide commercial launch services and satellite systems as a subsidiary of the China Aerospace Science and Technology Corp. The company has already launched a demonstration nanosatellite for Satellogic, as well as five larger satellites, and it's due to send three more spacecraft into low Earth orbit this year under the terms of an earlier agreement. "We're proud to extend our highly successful working relationship with Satellogic," Gao Ruofei, executive vice president of China Great Wall, said in today's news release. "Satellogic's constellation will introduce a new era of affordable Earth observation, just as the LM-6 will open new opportunities for the global space industry." U.S.-based satellite operators are generally barred from having their payloads launched on Chinese rockets. However, Satellogic's headquarters and development facility is located in Buenos Aires, Argentina, and its satellite assembly facility is in Montevideo, Uruguay. The company also has a data technology center in Barcelona, Spain; a product development center in Tel Aviv, Israel; and a business development center in Miami. Satellogic's newest branch office, in Beijing, will focus on constellation customization, data services and industrial applications. Satellogic says it employs more than 150 satellite engineers, solution specialists and experts in artificial intelligence. In 2017, the company raised US$27 million in a Series B funding round led by Tencent, a Chinese investment holding company. Like Planet and BlackSky, Satellogic is targeting satellite imaging applications in fields such as disaster response, oil and gas prospecting, infrastructure monitoring, forestry and agricultural crop assessment.



# Boeing Invests in Isotropic Systems

Boeing has invested in Isotropic Systems Ltd., a London-based startup that is pioneering next-generation solutions to better connect people and enterprises around the globe. By taking advantage of optical beam steering, Isotropic's innovative user terminals can simultaneously connect with several different satellites without increasing cost or complexity. This capability will help enable low-cost, mass-market broadband connectivity for consumers and help companies meet growing demand for satellite data, mobility and broadband services even in the most remote places.

Founded in 2013 by CEO John Finney, a former founding member of O3b Networks, Isotropic has redefined the approach to mass distribution of satellite broadband through affordable infrastructure. Isotropic joins Boeing subsidiary Millennium Space Systems and Boeing HorizonX Ventures portfolio startups Myriota, BridgeSat Inc. and Accion Systems in advancing the company's satellite and space-based capabilities. Isotropic is the second UK-based startup to join the HorizonX portfolio, following Reaction Engines in April 2018. Boeing HorizonX Ventures led the Series A funding round with participation from

WML, Space Angels and Space Capital. This latest investment will connect the Isotropic team with Boeing experts and resources to help advance the development of its terminal solutions. Boeing HorizonX Ventures targets investments that help scale startup innovation in aerospace. Its portfolio includes companies specializing in autonomous systems, additive manufacturing, energy and data storage, advanced materials, augmented reality systems and software, machine learning, hybrid-electric and hypersonic propulsion and Internet of Things (IoT) connectivity.

# SpaceX Launches Final Batch of Iridium Next Satellites

SpaceX launched a Falcon 9 rocket from Vandenberg Air Force Base at 7:31 a.m. local time on Friday, delivering the final 10 Iridium Next Satellite to Low Earth Orbit (LEO). All 10 satellites have successfully communicated with the Iridium Satellite Network Operations Center. This was the eighth and final launch for Iridium's launch campaign with SpaceX, seeing a total of 75 new satellites deployed over less than two years. Iridium has invested approximately US$3 billion to replace its original satellite system with a new network. Services provided will include Iridium Certus (providing L-band broadband connectivity), and the AireonSM aircraft surveillance system. According to the release, the Iridium satellite constellation is the only communications network with pole-to-pole coverage of the entire planet. It is comprised of six polar orbiting planes, each containing 11 crosslinked satellites totaling 66 in the operational constellation, creating a web of coverage around the Earth. The 10 Iridium Next satellites launched as part of this final mission were deployed to orbital plane three. Since the launches began, the constellation has been undergoing a one-for-one replacement, new satellite for old, achieved through a highly choreographed in-space maneuver known as a "slot swap."

# Airbus to Develop Satellite Bus for DARPA

Defense Advanced Research Projects Agency (DARPA) awarded a contract to Airbus Defense and Space to develop a satellite bus in support of the Blackjack program. OneWeb Satellites is also a strategic joint venture partner of Airbus. DARPA described the Blackjack program as an architecture demonstration intending to show the military utility of global Low Earth Orbit (LEO) constellations and mesh networks of lower size, weight, and cost. DARPA wants to buy commercial satellite buses and pair them with military sensors and payloads. The bus drives each satellite by generating power, controlling attitude, providing propulsion, transmitting spacecraft telemetry, and providing general payload accommodation including mounting locations for the military sensors. "Airbus has previously co-invested hundreds of millions of dollars in high-rate manufacturing technology and supply chain logistics to build large constellations of small satellites," said Airbus Defense and Space U.S. Space Programs Director Tim Deaver. "Airbus is committed to growing manufacturing capability in the US and our government customers can leverage this commercial capability to develop low-earth orbit constellations to complement large existing systems."

# Arianespace to Launch ANGELS, France's 1st Nanosatellite

Arianespace and the French Center for National Space Studies (CNES) Space Agency revealed that they have signed a launch contract for Argos Néo on a Generic Economical and Light Satellite (ANGELS), the first nanosatellite completely built by French industry. ANGELS will be launched as an auxiliary payload with the Cosmo-SkyMed Second Generation (CSG 1) and Characterizing Exoplanet Satellites (CHEOPS) by a Soyuz rocket in 2019 from the Guiana Space Center in French Guiana. It is jointly financed and developed by the French CNES Space Agency and Nexeya, an industrial group active in the aerospace, defense, energy, rail, and automotive markets. The satellite will be fitted with a miniaturized Argos Néo instrument, which is 10-times smaller than the equivalent previous-generation device. The instrument collects and determines the position of low-power signals and messages sent by the 20,000 Argos beacons now in service worldwide. Two project teams — CNES and Nexeya for ANGELS, and CNES, Thales Alenia Space and Syrlinks for Argos Néo — are working together on this French space project.

# Saudi Arabia Launches 16th Satellite into Space

Saudi Arabia launched the Saudi Geostationary Satellite 1 (SGS-1), its 16th satellite into space. The launch will strengthen the

telecommunications capacity, internet connectivity and secure communications in the MENA region. As previously reported by BroadcastProME, the satellite has been developed by a team from King Abdul Aziz City for Science and Technology (KACST). It will be launched in French Guiana by Arianespace, which provides launch services for all types of satellites. Lockheed Martin manufactured, tested and operated the satellite with the participation of Saudi engineers and scientists, who had been trained in order to be able to work and contribute to the satellite project. The launching of the satellite comes after efforts of Saudi Arabia's Crown Prince Mohammad bin Salman, as well as the Kingdom's Minister of Defense, who oversaw the stages of manufacture during visits to Lockheed Martin's San Francisco headquarters in April 2018. During the visit, the crown prince signed the final piece to be placed on the Saudi satellite before its launch with the words "above the clouds."

# Algeria's First Communication Satellite Alcomsat-1 Records Successes

Launched on December 10, 2017, Algeria's first communication satellite, Alcomsat-1 has made major technological progresses. The country is gaining its hold in the field of space telecommunication with the successful broadcasting of public television and radio channels from Alcomsat-1. Just after a few months of Alcomsat-1's launch, it successfully accomplished some of its missions like the broadcasting of five public television channels (National program, Canal Algerie, TVA3, TV4 and TV5) and 57 radio channels, previously broadcasted by foreign satellites. With this operation, Algeria has marked its entry to the broadcasting via satellite of television and radio channels. African Daily Voice noted that Alcomsat-1 satellite successfully completed a part of its missions with the official broadcasting of five HD TV channels, a process which started with the signing on 21 May 2018 of a framework agreement between TDA and the Algerian Space Agency (ASAL) on the optimal exploitation of this satellite's capacities, notably in the broadcasting part. Now the

North African country is contemplating over making a second telecommunication satellite supposedly titled Alcomsat-2. This is said to be built by the Algerian scientists and specialists. The first satellite attracted huge contribution from China.

# Intelsat Joins GSMA to Help Advance 5G Deployments

Intelsat joined Groupe Spéciale Mobile Association (GSMA), an organization representing mobile operators worldwide, to help further strengthen the integration of satellite and terrestrial technologies and advance 5G deployments. A shared goal of both Intelsat and GSMA is to deliver enhance connectivity and expand opportunities for the Mobile Network Operator (MNO) ecosystem. Intelsat is now a full member of the London-based GSMA. The association unites more than 750 operators with over 350 handset and device makers, software companies, equipment providers, and internet companies as well as organizations in adjacent industry sectors. "As 5G comes to market, we must capitalize on the strengths of multiple delivery technologies to

satiate the connectivity demands of businesses and communities around the world," said Intelsat Vice President (VP) and General Manager of Networks Jean-Philippe Gillet. "By joining the GSMA, we will continue to forge new working relationships and develop business models that accelerate the expansion of more powerful mobile networks. We will collaborate even more closely with companies across the mobile ecosystem and build innovative partnerships that incorporate the complementary strengths of satellite and terrestrial technologies and create the hybrid networks that advance the cost-effective deployment of mobile connectivity around the world."

# UAE Space Agency Unveils Regional Hub Plan

The UAE Space Agency (UAESA) has launched a National Plan for the Promotion of Space Investment aiming to increase domestic and foreign investment in the UAE space sector. The initiative promises to transform the nation into a regional hub for commercial space activities and advanced research and development. It also aims to encourage local investment vehicles to consider funding opportunities in the space sector, both domestically and globally. The announcement of the plan follows the decision of the UAESA's board of directors to adopt its articles in tandem, and in support of the objectives of the UAE Vision 2021 and the UAE Centennial 2071— which aim to establish the UAE as one of the world's best nations across various economic, social, and environmental fields. The strategy also contributes to the UAE's Science, Technology & Innovation Policy, as well as the UAE Strategy for the Fourth Industrial Revolution. It envisions a competitive national economy based on knowledge, innovation, and future technological applications that integrate the latest physical and digital technologies, while also encouraging small and medium enterprises. The investment plan is based on the National Space Policy issued in 2016, which called for a comprehensive approach to attracting and promoting investment in the space industry, encouraging and facilitating commercial space activity, and establishing the UAE as a major regional and global hub for space activities and advanced research and development. Dr. Ahmad Belhoul Al Falasi, UAE Minister of State for Higher Education and Advanced Skills and Chairman of the UAESA, said: "The agency's adoption of the National Plan for the Promotion of Space Investment comes within the framework of its strategy and the objectives of the sector in general. These objectives seek to contribute towards diversifying the national economy and developing advanced science, technology, and applications in the UAE, along with supporting scientific research, building Emirati capabilities and

instilling a culture of innovation, especially among the younger generations. "Space offers active and creative applications and solutions for growing vital local, regional, and global needs and challenges. These solutions include - but are not limited to - navigation tools, management of transport and shipping, management of natural resources, sustainability, monitoring of pollution and climate change, surveillance, crisis management and many more," said Al Falasi. "The plan contributes to transforming the UAE economy into one based on knowledge, advanced skills, and innovation. It also encourages cooperation and partnerships with relevant parties in the government, private, research, and academic sectors, as well as further serves to encourage local and foreign investment in the space industry and attract leading space firms to establish regional and global headquarters in the UAE," added Al Falasi. Private investments in space grew by 30.5% in 2017, as compared to 2016, and over the past 10 years the average yearly growth of private industry revenue grew at an average rate of 9.6%. According to CNBC, wealth management experts from Bank of America Merrill Lynch are expecting the Space Economy to be worth US$2.7 trillion in 30 years, while Morgan Stanley forecasts that the commercial space industry will triple in size by 2040. "In 2017, the total global space economy value amounted to USD 348 billion, 79% of which were commercial revenues while 21% were for government budgets and manned spaceflight. Private investments in space grew by 30.5% in 2017, as compared to 2016, and over the past 10 years the average yearly growth of private industry revenue grew at an average rate of 9.6%," said Al Falasi. "Through this plan, we seek to bolster our leading position in the space sector and with the vision and support of our wise leadership make the UAE one of the leading countries in the field of space science," concluded Al Falasi. Dr. Mohammed Nasser Al Ahbabi, director general of the UAE Space Agency, said:

"The UAE's space economy witnessed remarkable diversification and growth throughout the previous period. The overall investment in the UAE's space projects exceeded Dh22 billion with more than 10% growth rate on projects expenditure during the past two years. The number of space-related establishments in the UAE reached 57, which provided over 1,500 job opportunities," said Al Ahbabi. There are several notable examples of significant undertakings in the local industry. These include, the 'Hope Probe' Emirates Mars Mission, launching next year, the ambitious Mars 2117 long-term plan to build a self-sustaining colony on Mars in 100 years, an astronaut program, as well as the successes of satellite telecom operators Yahsat and Thuraya. The Mohamed Bin Rashed Space Center in Dubai has also recently launched the first locally designed and built UAE earth observation satellite, Khalifa Sat. With several of the largest and most globally active investment vehicles in the world, in recent years the UAE has diversified its global investment strategy beyond the traditional asset classes and begun strategically investing in venture capital, including founder-led start-ups in Series A or later-stage deals. Mubadala Investment Company, which also owns a significant stake in Virgin Galactic, has recently opened offices in Silicon Valley and London where they operate their venture capital-led initiatives through both their investment in the US$100B Softbank Vision Fund, as well as plan direct investments it intends to make. Al Ahbabi went on to say: "The UAESA recently signed a cooperation and collaboration and funding agreement with Krypto Labs as an incubator and accelerator for local entrepreneurs to develop and deliver innovative and commercially feasible geospatial, Earth observation and remote sensing applications, with special focus on solutions used in city planning, land management, and coastal security, as well as solutions used in disaster management operations."

# GetSAT and Honeywell Win Multi-Million Dollar Deal with US Government

GetSAT has been awarded, in partnership with a division of Honeywell, a multi-million dollar contract by a US Government agency for Command, Control, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) applications in support of missions during dire and emergent situations in the continental United States. The agency selected GetSAT's MilliSAT L/M (land and maritime) KA and KU-band versions to provide maritime and ground-based high-data rate, secure communications-on-the-move (COTM). GetSAT's portable MilliSAT L/M terminals will be deployed to support satellite on the move (SOTM) for both land-based vehicles and maritime platforms

in remote areas for emergency support. Based on the company's patented fully-interlaced InterFLAT panel technology for transmitting and receiving signals on the same panel, MilliSAT provides fully autonomous transmission and reception of high bandwidth data rates of more than 20 Mbps. The ruggedized, medium lightweight, KA and KU-band terminals meet the demanding requirements of full-time usage in harsh environments. GetSAT CEO, Kfir Benjamin reported, "The US Government has once again entrusted delicate and secure satcom missions, this time in remote areas, to GetSAT terminals. Together with Honeywell, we have delivered our leading-edge communications

platforms that enable the government agency to meet its critical operational needs. GetSAT is committed to providing on-the-move satcom platforms reaching the highest specifications and standards and we are proud that our solutions are already operating in the field and maritime environments." GetSat's micronized L/M terminals are easy to deploy and integrate and can be outfitted in various antenna sizes in accordance with bandwidth requirements of ground, air and maritime applications. Its unique all-in-one design and super-light compact installation offer significant savings in size, weight, and power usage (SWaP) and include an integrated BUC and modem.

# Nepal to Launch Its Satellite

Nepal is going to launch its own satellite soon by Baishak 2076. The Kyutech, Japan (Kyushu Institute of Technology) has assisted in the launch of Nepal's own Satellite. According to the Technology department head at NAST Mr. Rabindra Dhakal, Nepal Government has provided Rs 18 million to launch the satellite. Two Nepali engineers at Kyutech will lead the satellite launch. One of them Mr. Abhash Maskey is doing Ph.D. in "Space technology Engineering" and another Mr. HareRam Shrestha is doing Masters in Electrical Engineering at the University.

As known, Kyutech is the World's No. 1 academic operator of Small Satellites. The name of the Nepali Satellite has created some confusion here. Kantipur reports the name of the Satellite to be NepSat-1 whereas Nagarik writes it to be Birds-3. We will update once the actual name is known. Till now, Nepal has been using satellite link of other countries for communication and other purposes, paying huge sums of money. With the launch of own satellite, Nepal could overcome the huge cost and National security compromise. The Satellite will be mainly used for taking

photographs of the country on daily basis and disseminate information about its mountains, hills, Terai, Glaciers, roads as well as floods. Till now, the development of satellite has already been completed. Engineering module completed in August, while Environment test succeeded in December. So, the Satellite is ready to launch in Baishak, 2076 (Mid May 2019). Now, they are working to make a Ground Station, required for the communication to Satellite. Once everything is in place, NAST scientists and MoCIT officials will visit Japan in Baishak for the launch.

# Hughes to Supply Satellite Terminals for US Space and Naval Warfare Systems Center

Hughes Network Systems revealed that U.S. Space and Naval Warfare Systems Center (SSC) Atlantic ordered more than 200 of the Hughes 9211 Broadband Global Area Network (BGAN) satellite terminals. The order was placed through Hughes partner Marshall Communications. "Our Hughes 9211 BGAN comes in a compact, tablet-sized package, providing

warfighters a high-speed and reliable communications link in an easy-to-use, low-SWaP system that works in the most demanding situations," said Hughes Vice President (VP) and General Manager of Defense and Intelligence Systems Rick Lober. "We look forward to working with Marshall Communications Corporation and SSC Atlantic to supply this world-

class terminal for their global operations." The Hughes 9211 BGAN terminal delivers high-throughput speeds over 650 kilobits per second with multi-user Wi-Fi access and audio tone for signal acquisition. To date, Hughes has delivered these terminals to serve military, media correspondence, public safety and mobile health care needs.

# UAE, Saudi Arabia, Turkey Poised to Lead Emerging Middle East Space Industry

The Middle East is in the midst of a space boom, as the United Arab Emirates (UAE), Saudi Arabia and Turkey are poised to become regional leaders, experts contend. Israel and Iran have long been at the forefront of developing space technologies with the former set to become only the fourth country in history to land a spacecraft on the moon, and the latter successfully having launched a number of operational satellites in recent years. Now, other nations are following suit. The UAE is slated to send the first Emirati astronaut to the International Space Station in 2019. The country will also hold a Global Space Congress in March that will bring together private business industry leaders as well as officials from some 700 space agencies and related institutions. Notably, the Emirates' Space Agency is planning to launch a probe called Hope that is scheduled to reach Mars in 2021, timed to coincide with the country's 50th anniversary. "The UAE is by far the leader in the region, with a range of communications and high-resolution Earth observation satellites in orbit," Helen Jameson, Editor-in-Chief at the SpaceWatch Middle East digital magazine, related to The Media Line. "The UAE is also building the Mars Science City that will be a center for conducting scientific research into human habitats on Mars, as well as

planetary science missions. The UAE has set an ambitious goal of helping humanity establish a human outpost on Mars by 2117." The $140-million Mars Science City is intended to simulate life on the red planet and will feature a 1.9 million-square-foot domed structure. Once completed, it will be the largest such structure ever created. Another emerging industry leader in the Arab world is Saudi Arabia, which has boosted efforts to expand its space program through the King Abdulaziz City for Science and Technology (KACST). In recent weeks, the organization launched two locally-made satellites for aerial surveying. "Saudi Arabia is involved in the Chinese Chang'e lunar mission and has a fleet of communications satellites and is manufacturing increasingly sophisticated Earth observation satellites," Jameson highlighted. "Other Arab countries with satellite programs include Algeria, Morocco, Egypt, and Qatar, but none of these programs are anywhere near the scope and depth of the Emirati and Saudi programs." Both Riyadh and Abu Dhabi have few budgetary constraints impeding their long-term space ambitions, she underlined, unlike other regional players. The two countries are also relying on established space leaders to share their expertise such as the United States, Russia,

France, Japan and China. "Apart from Israel, the most advanced space program is that of the UAE, which has a space agency and has launched several satellites into space," Tal Inbar, head of the Israel-based Space Research Center at the Fisher Institute for Air and Space Strategic Studies, told The Media Line. "The most recent is the Khalifa Sat that was built, designed and tested entirely internally." Inbar stressed that developing the capability to launch a satellite is an exceedingly difficult and expensive endeavor. While Israel was the first regional country to launch its own satellite 30 years ago, he explained, Iran only managed the same feat decades later in 2009. "Most of the heavily-funded space initiatives in Israel are headed by the Ministry of Defense, so cooperation with other countries is very limited," Inbar said, adding that the upcoming launch of the Genesis spacecraft in February 2019 will be Israel's first attempt at a lunar landing. Aside from the UAE and the Saudis, Inbar believes Turkey could also become a trailblazer. "Ankara already has the ability to build satellites so it could be a very significant force in space in the next decade if it will have sufficient backing from the government and budget," he remarked. Earlier this month, Turkey formally unveiled a national space agency tasked with implementing a program based on policies outlined by President Recep Tayyip Erdogan. Despite the rapid growth of many Middle Eastern countries' space programs, some argue that a more collaborative approach is needed for the industry to really take of "In general, there is neither a competition (space race), nor sufficient cooperation," Ghanim Alotaibi, Regional Coordinator for the Middle East at the Space Generation Advisory Council (SGAC), conveyed to The Media Line. "This is due to the fact that each country has a completely different space program with different missions and visions. "Cooperation and working together are key challenges," he asserted. "The Middle East can offer a lot to the wider international space community. To me, it is a disappointment to know that the region can be better."

# Iridium Completes Historic Satellite Launch Campaign



Iridium Communications Inc. announced that at 07:31 am PST (15:31 UTC) a flight-proven SpaceX Falcon 9 rocket launched from Vandenberg Air Force Base and delivered the final 10 Iridium® NEXT satellites to low earth orbit (LEO). All 10 satellites have successfully communicated with the Iridium Satellite Network Operations Center and are preparing to undergo initial on-orbit testing. This was the eighth and final launch for Iridium's historic launch campaign with SpaceX, seeing a total of 75 new satellites deployed over less than two years. Iridium has invested approximately $3 billion to replace its original satellite system with a new, state-of-the-art network, ushering in an era of financial and technological transformation for the company. At the core of this transformation is the dramatic change in cash flows as construction capital expenses end and a decade or longer "capex holiday" allows significant cash generation from existing and new services. These include Iridium CertusSM, which will provide the world's fastest and only truly global specialty L-band broadband connectivity, enabling highly mobile internet access using smaller and

more cost-effective terminals, and the AireonSM aircraft surveillance system, extending real-time visibility of aircraft for air traffic controllers and airlines to the entire planet for the first time. "It has been an honor to deliver 75 new Iridium NEXT satellites to orbit. Matt and the entire Iridium NEXT team have been incredible to work with," said Gwynne Shotwell, President and Chief Operating Officer at SpaceX. "On behalf of all of our employees, congratulations to Iridium on achieving this incredible milestone." The Iridium satellite constellation is unlike any other in orbit and is the only communications network with pole-to-pole coverage of the entire planet. It is comprised of six polar orbiting planes, each containing 11 crosslinked satellites totaling 66 in the operational constellation, creating a web of coverage around the Earth. The 10 Iridium NEXT satellites launched as part of this final mission were deployed to orbital plane three. Since the launches began, the constellation has been undergoing a one-for-one replacement, new satellite for old, achieved through a highly choreographed in-space maneuver known as a "slot swap." "There are few words to describe

what it feels like to complete a vision started many years ago when I joined the company and what it means for Iridium and our future," said Iridium CEO Matt Desch. "Our gratitude to SpaceX for helping bring this new generation of satellites to orbit, so flawlessly every time is beyond words. However, for Iridium, we're not quite across the finish line yet, as there is still some work to do to put these satellites into operation. Once that's complete, our future will be in place. I'm just incredibly proud of our team right now." To date, new satellites make up 60 of the 66 satellites in operation, with the final six scheduled for activation in the coming weeks from today's launch. Iridium NEXT satellites were designed by Thales Alenia Space, which serves as system prime contractor, and are being integrated by Thales' subcontractor, Northrop Grumman. The production process features an 18-station, state-of-the-art assembly line system for all 81 Iridium NEXT satellites being built. "Totally deployed, Iridium NEXT is now arguably the world's highest performance and most sophisticated constellation which represents today's state of the art in terms of technology and flexibility and Thales Alenia Space is so proud for having risen to this huge challenge. I would like to thank Iridium for having placed its trust in us, and thank everybody at my company, at Iridium and at our partners for having worked as "One Team," all with the sole objective of delivering the constellation to orbit as quickly as possible, while guaranteeing top-flight quality," declared Jean Loïc Galle, CEO of Thales Alenia Space. In total, 81 satellites are being built with 75 successfully launched. Nine of the satellites launched will serve as on-orbit spares, and the remaining six will be ground spares.

# Rwanda to Launch Communications Satellite This Year

Rwanda is to get its first dedicated communications satellite by the end of this year – a full year earlier than originally planned. A report from Agence Ecofin says

that the satellite, which is being deployed jointly by the government of Rwanda, the Japan International Cooperation Agency (JICA) and the Japan Space Agency (JAXA),

is expected to be in orbit by May this year. The platform will be used to improve rural connectivity, to assist with weather tracking and military communications.

# Newtec Awarded Contract to Boost Affordable Broadband Services Across Asia-Pacific on Kacific's High Throughput Satellite

Newtec has announced that its Newtec Dialog® VSAT multiservice platform has been selected by broadband satellite operator, Kacific, for its new High Throughput Satellite, Kacific1, to significantly expand its broadband service delivery in underserved areas of South East Asia, New Zealand and the Pacific Islands. The initial contract is for $10million of Newtec Dialog hubs and this is expected to result in further terminal procurements totaling several million in the first years of service. Kacific1 will deliver affordable, high-speed internet broadband to telecommunications companies, internet service providers and governments throughout the region, with Newtec's Mx-DMA® return technology providing the highest possible bandwidth efficiency. The Kacific1 satellite features 56 high

power subscriber spot beams, each with the capability to provide targeted capacity at high speeds. Kacific services enable access to high demand applications, such as community internet access and mobile backhaul that will help stimulate socio-economic activity throughout the region. Public institutions will benefit from dedicated services including healthcare, education and civil defense, in areas that are beyond the economical reach of terrestrial infrastructures in most of Kacific's coverage areas. Kacific was recently presented with the Better Satellite World award for its focus on connecting underserved populations. "The Kacific HUB, based on the Newtec Dialog multiservice platform is a pivotal part of the satellite network and we selected Newtec because it demonstrates the

highest performance and ability to offer the very high link efficiencies and availabilities required for our Ka-band spot beam system," said Christian Patouraux, CEO and Founder of Kacific. "We have also been very impressed with other unique features offered by Newtec such as the Satellite Network Calculator, which enables us to tailor new services in a very efficient and fast-to-market manner, which will only help ensure the reliability and enhance the quality of our services to our customers." Chosen for its excellence in innovation, Newtec's next-generation Mx-DMA return technology incorporates the best features of MF-TDMA and SCPC technologies to provide dynamic bandwidth allocation with the highest level of efficiency. Mx-DMA return technology on the Newtec Dialog platform uniquely adjusts the frequency plan, the symbol rate, the modulation, coding and power in real-time for every terminal in the satellite network in response to traffic demand and Quality of Service (QoS) changes. "In partnering with Kacific, we are strengthening our presence in South East Asia and the Pacific and we are extremely proud to be involved with a project that bridges the digital divide to people in regions that have never before had access," said Thomas Van den Driessche, CEO at Newtec. "Amongst many other features, our Satellite Network Calculator has an acute ability to provide valuable insight into the performance of the network. Its use in a multi-beam satellite network such as this will allow Kacific to harness these insights to optimize future deployments and add value for its regional partners and customers."


*Kacific1 coverage, image courtesy Kacific*

# Algerie Telecom Launching Consumer Satellite Broadband in September

Algerie Telecom Satellite (ATS), a subsidiary of state-backed incumbent operator Algerie Telecom, has revealed that it will augment its B2B-focused portfolio by launching residential satellite broadband internet services in September this year.

As reported by Agence Ecofin, ATS' CEO Mohamed Anouar Benabdelouahad noted that the user cost for the consumer broadband service will be 'a little higher than that of ADSL … justified by the cost of equipment'. The service will focus on

isolated regions, unserved border areas and other under-served zones, using bandwidth of the Algerian-owned satellite Alcomsat-1. The project supports the government's aims to reduce the digital divide between rural and urban dwellers.

# Astrocast Launches IoT into Space

Astrocast has announced the launch of 3 new pilots of its Low Earth Orbit Nanosatellite Network. The pilots with Actia, Marine Instruments, and Swiss Fresh Water highlight the power of satellite networks to deliver affordable communications to the world's most remote areas. Designed specifically for IoT, Astrocast's two-way system allows companies to monitor and control their remote assets, including over-the-air upgrades at lower latency and cost than existing satellite communications networks. "The onboard telematic equipment is designed to support some of the toughest work, in the most remote areas of the world. Agriculture, construction and transportation companies are among the many companies relying on us to keep connected vehicles," said Philippe Cabon, CTO of Actia. "Astrocast will help us to connect vehicles everywhere." Currently only 10% of the world is covered by cellular networks and less than 1% of the world is covered by IoT networks like LoRaWAN or Sigfox. With the launch of its first L-Band, two-way communication nanosatellite in December, Astrocast plans to deliver global accessibility at an affordable price.

Until today, satellite communications were cost prohibitive for most companies. Now, even small companies with a big impact, like Swiss Fresh Water that is bringing water purification to remote villages around the world, are able to monitor their machines from anywhere. "When we started this project, we knew we had the right tools and technology to bring clean water to the world. Our water stations are at the center of some very remote villages and are a lifeline to those communities," said Mr. Jean-Luc Mossier, Executive Chairman of Swiss Fresh Water. "With Astrocast we can make sure these treatment machines are producing clean drinking water and remotely perform maintenance to ensure their operations." Astrocast is a nanosatellite network of 64 cubesats specifically designed to transmit and receive low bandwidth data from IoT devices. Astrocast is the first complete solution to deliver:

- 100% coverage of the globe including remote areas
- Lowest latency low earth orbit network
- Two-way communications
- L-Band and S-Band frequencies
- Communication module smaller than a

credit card designed in partnership with Airbus
- 256 bit encryption with multi-level security
- Web application for monitoring assets and subscription plan

"It is very important for our customers to be able to track and monitor their marine buoys, especially deep at sea and in extreme conditions," said Francisco Pino, Co-Owner of Marine Instruments. "Our collaboration with Astrocast will make monitoring and controlling IoT devices in remote areas more feasible, especially when the area is hundreds of thousands of nautical miles wide." The Astrocast pilots will continue throughout Q1 of 2019. Companies interested in joining the Astrocast pilot program can email for more information. "The growth of IoT devices for commercial purposes is outpacing anything the analysts predicted. And in many cases these devices are performing tasks that are impacting the lives of entire populations," said Fabien Jordan, CEO of Astrocast. "Astrocast is helping make world changing new IoT applications possible."

# NSR Predicts Large Growth in VSAT and Broadband Satellite Markets

NSR released its VSAT and Broadband Satellite Markets 17th Edition report, in which it predicts cumulative market revenue of US$159 billion in the next decade. The report also predicts 13.4 percent annual growth in the installed base of consumer sites alone. Enterprise Very Small Aperture Terminal (VSAT) is a solid contributor with a predicted US$12.3 billion in capacity revenues by 2027, driven by key verticals worldwide. "Satellite Consumer Broadband is just scratching the surface of the opportunity, capturing less than 1 percent of the potential addressable market," said NSR Senior Analyst Lluc Palerm. "Subscribers are very sensitive to more generous data caps and cost. Consequently, lower capacity pricing will trigger strong demand elasticities. Additionally, the ecosystem is still underdeveloped in many regions. A stronger focus on retail, and newly available capacity, will see accelerated growth. Furthermore, new business models like Wi-Fi Hotspots are proliferating, which would open the lowest segments of the market. Smallcells will drive 43 percent of service revenues by 2027." Video is, by a significant margin, the primary driver of data traffic. Multiple offers are now publicizing unmetered services for web browsing, email, and other critical functions, but "streaming time allowance" is the main

influencer on subscribers' quality of experience. Limiting video quality to 720p is now standard among platforms so that users can enjoy faster streaming time, albeit sacrificing video quality. On the Enterprise VSAT side, "Growth returns in the enterprise segment. Backhaul remains the key vertical and will generate 55 percent of cumulative revenues in the next 10 years," said NSR Senior Analyst Gagan Agrawal. "While some regions continue under turbulent times, Asia has generated excellent growth with numerous big deployments."



**17th Edition**

**VSAT and Broadband Satellite Markets**

**NSR** NORTHERN SKY RESEARCH

## ARTICLE

# eSIM Technology Brings IoT Connectivity to Everyday Things

From vehicles with the ability to transmit information back to a fleet owner or a manufacturer, wearable wrist alert bands capable of communicating vital health information for those with medical conditions, to vending machines able to order their own replacement stock - the Internet of Things (IoT) is poised to connect just about everything.

**IoT is busy transforming everyday items into connected devices, providing unprecedented connectivity and the exchange of information which turns otherwise "dumb" devices into devices capable of being monitored and controlled 24x7 - unleashing a seemingly limitless opportunity for consumer and commercial applications.**

Touted as the next great leap forward in communication technologies, IoT is busy transforming everyday items into connected devices, providing unprecedented connectivity and the exchange of information which turns otherwise "dumb" devices into devices capable of being monitored and controlled 24x7 - unleashing a seemingly limitless opportunity for consumer and commercial applications.

Challenges which have to date hampered the widespread IoT adoption have included the development and implementation of appropriate protocols, technologies and partnerships that enable relatively simple machines to be connected to global networks.

At the GSMA Mobile World Congress (MWC) which is being held in Barcelona from 25-28 February, PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, will showcase technologies ideally positioned to support IoT growth both in Asia and across the world.

**Craig Price**
SVP, Mobility Products & Marketing
PCCW Global

**PCCW Global**

**Much smaller than a traditional SIM, eSIM is typically embedded into a physical device, and the technology is able to be remotely provisioned and configured by more than one network provider.**

One such technology is Embedded SIM (eSIM), a critically important development for the widespread deployment of IoT devices, due to its small size and significant other technological benefits. eSIM is a GSMA compliant and secure new technology that has been designed to remotely manage multiple mobile network operator subscriptions. The technology is available in various form factors and can be hard-wired or manually inserted into any kind of compliant device.

**Critical to IoT deployment is the eSIM's ability to be reconfigured after being deployed - such as on an in-transit shipping container. In addition, eSIM devices require less power than traditional SIM devices, which is good for extended battery life and critical for IoT devices that may require low power consumption.**

Much smaller than a traditional SIM, eSIM is typically embedded into a physical device, and the technology is able to be remotely provisioned and configured by more than one network provider. This is a true enabler for IoT as it allows devices to be manufactured and installed in the field and then provisioned when service is actually needed, which in turn allows IoT services to develop in a completely flexible way - unleashing a multitude of new services. As an example, a single embedded eSIM can be configured to make use of multiple service providers, or enable international travellers to seamlessly migrate between networks without ever needing to swap SIM cards.

Since eSIM is typically embedded into a device, the technology significantly improves security because its use can be controlled from a centralised responsible authority, such as a network service provider. eSIM is also more reliable since the contacts are typically hard-wired into the device. This is particularly useful in extreme environments that may be common in IoT applications. Critical to IoT deployment is the eSIM's ability to be reconfigured after being deployed - such as on an in-transit shipping container. In addition, eSIM devices require less power than traditional SIM devices, which is good for extended battery life and critical for IoT devices that may require low power consumption.

An IoT application for eSIMs which is gaining rapid traction is as enablers for "connected cars", allowing a wide range of information, including performance data, to be transmitted back to a manufacturer or fleet owner for analysis purposes. In addition, a vehicle with an embedded eSIM that is integrated with a vehicle's electronics can significantly improve security, or even automatically alert emergency services, providing precise GPS coordinates in the event of an accident.

eSIM technology is expected to have a wide-ranging impact on a diverse number of industries. From logistics, through to smart homes and smart cities - everything can be connected with small eSIM technology that requires reduced power for longer up-time between charging.

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PCCW Global's parent company HKT, and its mobile network operator csl, have already adopted and are actively supporting eSIM in the highly competitive Hong Kong telecommunications market, utilising the architecture recommended and certified by the GSMA to ensure compatibility. Compatible devices include selected smartphones and watches from Apple and Google. Standalone eSIM products are promoted as The Club eSIM in Hong Kong.

PCCW Global will be showcasing eSIM capabilities coupled with global roaming and connection management as part of the company's IoT suite of solutions.

# WHOLESALE NEWS

## BICS Sees 95% Increase in 4G Roaming in 2018

Wholesale carrier BICS says 4G/LTE roaming traffic last year was almost double that of 2017, continuing the year-on-year trend of rapid growth. Proximus-owned BICS expects this traffic to increase further in 2019, partly driven by the European Union legislation which came into effect in 2017, banning European operators from charging a premium for roaming within the EU. A further 20% of European subscribers who have yet to take advantage of the legislation are expected to do so in 2019.

LTE roaming traffic growth exploded by 800% during summer 2017, when this abolition of roaming charges was first implemented. BICS predicts that global 4G LTE roaming growth is likely to increase at 40-50% in 2019, as subscribers' awareness increases and operators offer more competitive packages. Mikaël Schachne, VP Mobility Solutions, BICS, said, "4G/LTE roaming has opened up a plethora of opportunities for individual subscribers and businesses alike. However, when

demand and reliance increase, so too must supporting infrastructure and service availability. "European subscribers have enjoyed being able to 'Roam Like at Home' and now seek high quality, affordable roaming services wherever they travel. This is forcing operators in other regions outside of the EU to match the European offering by coming together to offer more cost-effective packages to subscribers, while optimizing traffic flow at the back-end." It is still unclear what will happen with roaming charges after Brexit. The UK government says that in the event of a deal, surcharge-free roaming would continue to be guaranteed during the Implementation Period. After that, the plans are dependent on the outcome of negotiations. If the UK leaves the EU without a deal on March 29, the costs that EU mobile operators can charge for roaming services would no longer be regulated. "This would mean that surcharge-free roaming when you travel to the EU could no longer be guaranteed," government guidance notes. The UK government says it would legislate for a financial limit on mobile data usage while abroad.
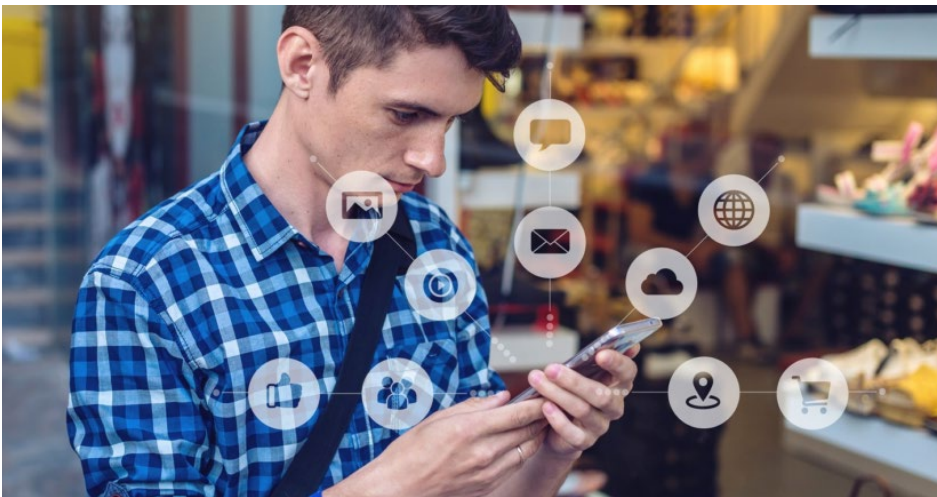
## Free Mobile Extends Roaming Data Offer to Tunisia

French operator Free Mobile has announced the inclusion of Tunisia to the list of international destinations covered by the roaming data offer under its EUR 19.99 postpaid mobile plan (priced EUR 15.99 for Free broadband subscribers). The plan's roaming allowance includes 25 GB per month and, alongside Tunisia, covers EU countries, French overseas territories, Switzerland, the US, Canada, Mexico,

Brazil, Algeria, Israel, Turkey, South Africa, Australia, New Zealand, India, Malaysia, Thailand, Russia and Ukraine.

## National Roaming Charges Repealed From 1 June 2019

In a key decision from late-December Russia's State Duma (the lower house of the Federal Assembly) adopted a bill that repeals national mobile roaming charges. As per the bill, the ruling will take effect on 1 June 2019, meaning that

subscribers travelling across Russia are guaranteed to receive the same tariffs, regardless of which region they are located in. TeleGeography notes that 2018 saw Russia's four national mobile operators all cancel on-net 'domestic roaming' charges

for their own network users. Beeline was the first to remove the incoming call charges on 20 August 2018, followed by Tele2 on 27 August, MTS on 30 August and MegaFon on 1 September.

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**BUBBLETONE**
**BLOCKCHAIN IN TELECOM**

## ARTICLE

# Potential of Bubbletone Blockchain in Telecom for Further Development of eSIM Technology

**Alexander Yakovenko**
Project Director
Bubbletone

Mobile device manufacturers have been increasingly producing equipment that only works with an embedded SIM card, which is called eSIM. The latest examples are Apple Watch Series 3, Gear S2 Classic 3G and others. Growing is the number of smartphones that have embedded SIM cards as the main connectivity component or are equipped with it along with the traditional SIM cards. Smart Insights forecasts the sales of eSIM-enabled handsets would total 346 million to 864 million units by 2020. In the near future 100% of devices will be eSIM-enabled. In the IoT segment the pace of eSIM adoption is even higher.

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The eSIM standard requires pre-installation of a bootstrap mobile profile during manufacturing of eSIMs. Any device vendor that produces "connected" devices has to find a provider of the bootstrap profile. Any small and medium-sized mobile operator should also resolve the same issue.

Any IoT device vendor can produce "connected" devices, with easy connectivity to a local mobile network via embedded SIM cards. In order to implement this case, some problems should be solved:

- How to provide choosing of a local mobile operator and its tariff plan;
- How to pay for its services;
- How to download its mobile profile onto eSIM.

Bubbletone Blockchain in Telecom can take care of these concerns by providing an easy solution for device vendors and mobile operators. Here is how it works.

For embedded SIM users, Bubbletone offers an ecosystem where new economic relationships can be made by connecting mobile devices to a specific network. Each user will have the opportunity to choose a network operator and switch to another operator, including the MNP procedure, without the involvement of operators and retailers. This approach reduces the costs of subscriber acquisition, starter kits production and logistics. As a result of this change, the operators can use new mechanisms to reduce the price of services to local rates, as compared to selling physical SIM cards in retail stores. We hope that in the coming 3 to 5 years, the Bubbletone blockchain-based platform will be able to process a large amount of connections to mobile networks worldwide. To implement this process, vendors of mobile devices will just have to connect to the Bubbletone platform.

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Bubbletone is developing an open marketplace of bootstrap mobile profiles from proven mobile carriers. As a result, any device vendor or mobile operator is able to create a "request" (smart-contract) to any provider for required amount of bootstrap profiles. All settlements and profile management are conducted via transactions on the blockchain platform.

As for benefits for all participants, they are as follows:
- New revenue streams on telecom services for device vendors;
- New customers with zero acquisition cost for mobile carriers;
- Convenient for end-users.

### New opportunities with non-geographic mobile profile (GMP)

The Bubbletone team is also on its way to create GMP, which is independent of the legal requirements of any specific country where mobile service is rendered. This will allow for the creation of a universal product operational throughout the world according to uniform rules. GMP allows registration of mobile devices and loading of the mobile profile of the local operator via SMS messages or https channel in accordance with eSIM standards (SGP-21), Security Mechanism for the SIM (3GPP TS 23.048), and other solutions ensuring secure loading of profiles to mobile devices. This gives the user the option to select the necessary network operator and use mobile services at local rates worldwide.

For the GMP to operate correctly, the team plans to implement and maintain the relevant telecommunications infrastructure and also to sign agreements with network operators throughout the world to ensure the GMP is registered in their networks. To accomplish this, the team is going to use the infrastructure of its MVNO network. Agreements with operators will be signed according to the standard roaming procedure utilizing the existing infrastructure of transit operators (SS7,IPX/GRX). GMP will change the current process of connecting a mobile device to the mobile operator eliminating the involvement of retail chains and SIM card logistics.

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### PoC

Bubbeltone has been conducting a proof of concept (PoC) with mobile operators worldwide. PoC is a demonstration, the purpose of which is to verify that the concept has the potential for real-world application.

As the technology is ready for use, the team invites mobile operators and service providers that are interested in seeing evidence of the blockchain capability, to participate in PoC. More information available at https://blockchaintele.com/.

## TECHNOLOGY NEWS

# AT&T Promises Nationwide 5G in Early 2020 — Using Sub-6GHz Spectrum

AT&T already launched its initial mobile 5G network in parts of 12 U.S. cities last December, but it's now preparing for full nationwide coverage — a dauntingly large task that its millimeter wave small cells won't be able to handle alone. This morning, the carrier revealed that it will "offer nationwide 5G coverage with our lower band spectrum," specifically the sub-6GHz frequencies discussed in our interview with AT&T VP Gordon Mansfield. While the announcement isn't entirely surprising given that AT&T began to distinguish between "5G" and "5G+" in December, noting that it planned to call high-speed millimeter wave service "5G+" and offer it only in select high-traffic areas, this is the first official confirmation that AT&T's nationwide 5G network will rely upon aggregating lower-bandwidth radio signals, which spread more widely from larger towers. Rival T-Mobile has similarly said that it will use low-bandwidth towers for its nationwide 5G network, while Verizon has focused largely on "true 5G" using high-capacity millimeter wave spectrum. Even so, all of the carriers will eventually rely upon more than one radio band to provide 5G service. Each carrier is expected to convert some of its existing LTE spectrum into 5G spectrum, though

there's a substantial likelihood of a speed penalty for doing so — enough that there could be a noticeable performance gap between millimeter wave and sub-6GHz 5G networks. AT&T specifically says that it plans to "begin deploying that lower band spectrum in the second half of this year," suggesting that the allocation of some existing LTE spectrum for 5G will happen sooner rather than later, supporting an already announced Samsung sub-6GHz smartphone. In the transition from 4G to 5G, AT&T says that it has brought two interim technologies into more markets than expected: 1Gbps LTE-LAA is now in parts of 55 cities, with its controversially named

"5G Evolution" or "5G E" — actually just 4G LTE-Advanced — in over 400 markets, offering roughly 400Mbps speeds on select 4G devices. Towers with the 5G E hardware will be capable of flipping to actual 5G service in the near future, but until then will confuse 4G users into believing that they're using 5G technologies. AT&T also said that it is expanding its agreement with AR purveyor Magic Leap to include business solutions, including manufacturing, retail, and health care applications. Magic Leap's current-generation hardware has no cellular hardware, but the company is expected to offer a 5G version in the future, in partnership with AT&T.



# China's 5G to Begin in 2019, 10,000 Base Stations Expected by 2020

The commercial deployment of 5G technology in China will come of age in 2019 with the first batch of 5G commercial data terminals and smartphones launched in the first half of 2019, according to a report of China's internet industry development released by the Internet Society of China. The report was released at the 2019 China Internet Industry Annual Conference in Beijing. It also predicts that by 2020, the number of Chinese 5G base stations will reach 10,000. 2018 witnessed a critical testing period for 5G technology in

China. Three Chinese telecommunications operators - China Mobile, China Telecom and China Unicom, have carried out large-scale testing and pre-commercial deployment in pilot cities, said Gao Xinmin, deputy director of the Internet Society of China. He added that testing areas included industrial internet, smart city construction, Internet of Vehicles with 5G and smart education. The report says all of the three telecommunications operators aim to realize pre-commercial deployment in 2019 and put 5G into commercial

operation in 2020. It is notable that 5G will empower the networked driverless technology, in order to support different application scenarios such as easing congestion, real-time scheduling and emergency warning. Wu Hequan, president of the Internet Society of China, said at the conference that 5G, artificial intelligence and industrial internet will be the three main areas to develop in the foreseeable future.

# Wi-Fi Alliance Certification Program for Wi-Fi 6 Coming in Q3

With so much talk about Wi-Fi 6 expected at CES 2019, the Wi-Fi Alliance decided to announce that its Wi-Fi Certified 6 program will be coming online in the third quarter of 2019. That's along the same time frame as the alliance had been expecting—and it's a rather ambitious one at that. Kevin Robinson, director of marketing at Wi-Fi Alliance, said the sheer number of new features supported in Wi-Fi 6 makes for a challenging situation in terms of getting everyone on the same interoperability page. "As we start getting into a lot of the things that are in Wi-Fi 6, there is a lot of new innovation in this. There's just a lot of work to do to ensure it's interoperable across many vendors," he told FierceWirelessTech. More advanced versions of multi-user (MU) MIMO are used in Wi-Fi 6, which allows more data to be transferred at once. The analogy with MU-MIMO is it adds more "trucks" to the fleet and allows the network to dispatch the trucks to different locations; before it might have been a single truck in the fleet that was only partially loaded. Put another way, MU-MIMO with Wi-Fi 5 was akin to having four trucks in the fleet, and they could move data in parallel to multiple clients at a time. With Wi-Fi 6, "we're essentially doubling the number of trucks"; there could be eight trucks in the fleet and they correlate to a spatial stream, so more data paths can be simultaneously added to clients. "What this ultimately does is it increases the overall throughput of the network," to where it's approaching 10 Gbps with Wi-Fi 6, he said. OFDMA has been a popular technique in cellular, and now it's making its way into Wi-Fi with version 6. OFDMA allows for more efficient use of the space and capacity that the "truck" provides, and it allows for addressing latency-sensitive applications. It's particularly key in voice traffic, which is more sensitive to latency, he said. Wi-Fi 6 enhances performance at both 2.4 and 5 GHz, and it will also improve power efficiency. As for other spectrum bands, like the 6 GHz band that the FCC is considering opening for more unlicensed uses, there's still a lot unknown about the regulatory framework. Yet the industry expects that Wi-Fi 6 should be easily adapted to work in the 6 GHz band, and the IEEE is already working on extensions based on what is known, according to Robinson. Other features of Wi-Fi 6 include transmit beamforming, 1024 quadrature amplitude modulation mode and target wake time, the latter of which will significantly improve battery life in Wi-Fi devices, including for internet of things. There's no shortage of industry momentum around Wi-Fi 6, which is the name the alliance adopted to simplify the numbering scheme for the latest and greatest in Wi-Fi. Wi-Fi 6 identifies technology running on 802.11ax, while Wi-Fi 5 denotes devices that support 082.11ac and Wi-Fi 4 correlates to devices running 802.11n. Recent polling data indicate more than half of users want the latest technology in their devices, but nearly three-quarters of respondents avoid buying devices when it's too difficult to understand technical labels and descriptions, according to the Wi-Fi Alliance. The new naming structure should go a long way toward rectifying that. ABI is projecting Wi-Fi 6 chipsets will surpass the 1 billion threshold by 2022, and IDC predicts that by mid-2019, the industry will start to see the bulk of early stage Wi-Fi 6 rollouts, with more coming at the end of the year going into 2020. Of course, once the certification program kicks in, that will ensure devices meet interoperability and security standards and the industry will start to see even more acceleration. Just last week, ARRIS announced a new Wi-Fi 6 mesh system that promises gigabit speeds to every device in every room. Dubbed the SURFboard mAX Pro Mesh Wi-Fi System, the product features tri-band, Wi-Fi 6, 4x4 and mesh. ARRIS said that while today's mesh systems commonly use dual-band (2.4 GHz and 5 GHz) technology, it designed the SURFboard mAX Pro System around tri-band to leverage additional frequency bands for more throughput with less interference. In a mesh system with more than one unit, the two bands dedicated for client connections run in 2.4 GHz and low-band 5 GHz, while the dedicated third band for connection between the mesh nodes runs in high-band 5 GHz. In a single unit setup, all three bands are enabled for client connections. In either scenario, steering is enabled for the client connections, i.e., mAX Pro automatically connects the client to the fastest band available, according to Jonathan Wu, vice president of product management at ARRIS, in response to an inquiry by FierceWirelessTech. The addition of a third 5 GHz band not only supports a dedicated connection between the two routers in the system, it also enables more connected devices in a single router configuration.

# Slovak Telekom Tests Massive MIMO

Deutsche Telekom (DT) subsidiary Slovak Telekom says it has moved a step closer to 5G following its trials of Massive MIMO technology with Ericsson. The tests, which the telco claims were the first of its type in Slovakia, were carried out using three base stations in the Bratislava district of Dubravka. The firm says it has boosted speeds on its 4G LTE networks to 300Mbps, 375Mbps and 900Mbps as it prepares to launch LTE-Advanced Pro and, ultimately, 5G systems.

# T-Mobile US Completes 600MHz 5G Call in Las Vegas

T-Mobile US has teamed up with vendor duo Ericsson and Intel at the CES 2019 event in Las Vegas to stage what it claims is 'the world's first 5G data call and video call' on a live 600MHz network. The cellco also accomplished a tri-band 5G video call with three users on different spectrum bands: 600MHz, 28GHz and 39GHz. T-Mobile's press release notes: 'Low-band 600MHz spectrum delivers a broad layer of 5G and provides much needed balance to millimeter wave (mmWave) – which is an important piece of the 5G puzzle – but has limited coverage (less than a square mile) and is unable to pass through most objects, like walls.' TeleGeography notes that T-Mobile expects to launch its nationwide 5G network in 2020 and is in the process of deploying 5G-ready equipment as it rolls out its 600MHz 'Extended Range LTE' network, which is already live in more than 1,500 cities and towns in 37 states and Puerto Rico.



# Ericsson and Panasonic Avionics Bringing Connectivity to the Skies with 5G Ready Platform

Ericsson and Panasonic Avionics Corporation (Panasonic) have announced that Ericsson's Core Network as a Service solution is now live, supporting connectivity services across multiple markets served by Panasonic. Ericsson's Core Network as a Service solution will help Panasonic and its subsidiary AeroMobile, a global GSMA telecoms operator, provide data, voice and messaging services to the millions of airline passengers that use these services in flight. The collaboration between Ericsson, Panasonic and AeroMobile started in 2016 and is now fully operational and delivers services to Panasonic customers worldwide. As part of Panasonic's initiative to bring a superior connected experience onboard commercial aircraft, Panasonic and Ericsson have seamlessly migrated the existing service operating across a global fleet of aircraft onto the Core Network, delivered as a Service, while maintaining network performance



and customer experience. Every passenger whose mobile service provider has a roaming agreement with AeroMobile can use the service, which is supported by mobile operators across the globe and delivered inflight on board more than 20 of Panasonic's global commercial airline customers. The geo-redundant solution is delivered through Ericsson's ground-breaking Core Network as a Service and includes virtualized network applications such as packet core, unified data management, mediation, and mobile switching delivered on the Ericsson NFV Infrastructure. The Core Network solution is part of Ericsson's as a Service offering to service providers globally, and is able to support 5G services to the passenger and airline. Kevin Rogers, CEO of AeroMobile, says: "Our partnership with Ericsson, and the technology provided, will allow us to better serve the communications needs of our passenger and airline customers. Furthermore, the solution enables us to grow our footprint and expand into other services offering a richer experience for the passenger and operational efficiencies for our airline customers. We are looking forward to continuing our exciting collaboration with Ericsson." Marielle Lindgren, Head of Customer Unit UK and Ireland at Ericsson, says: "Panasonic Avionics is the first customer on Ericsson's newly introduced Core Network as a Service solution, which aims to bring Ericsson's leadership and expertise to a wide range of service providers. We're proud to have initially been chosen as Panasonic Avionics' supplier for a 5G ready core network, and pleased that the project is now live." The two companies will explore other services to address further market segments and opportunities, while ensuring service continuity and the constant evolution of the live network, including exploring new 5G use cases.

# 2019: Artificial Intelligence Starts to Blossom across Telecom Industry

Whether it's networks, services, virtualization, or industrial applications, AI is crucial for solving complex problems while enabling new technologies. In order for AI to flourish, there first needs to be underlying machine learning and deeper analytics of data in place, which is well underway this year. AI is key to enabling future services, whether they be 5G, IoT or keeping up with bandwidth demands due to increased video streaming. "AI is probably the most overused buzzword, or will be by the end of next year," said Adva's Ulrich Kohn, director, technical marketing, in a recent interview with FierceTelecom. "Everybody is trying to do AI." Kohn said Adva is prepping for AI by putting machine learning into its underlying networks, and that AI will be play a pivotal role in managing all of the elements from disaggregation. By putting AI and deep learning into software-defined architectures, network operators

and enterprises can move a lot of the human manual processes into automated operations in the near term. The long-term goal is moving from automated elements to closed loop automation and finally to autonomous control of networks. One example of AI development from this is year is Colt Technology Services. Colt started working on its Sentio initiative for its on-demand platform in early 2018. Sentio is the network intelligence platform that uses machine learning, analytics and artificial intelligence for automated service management, service modification or restoration based on closed-loop automation, and data analysis and correlation. Colt's Mirko Voltolini, head of network on demand, said the goal of Sentio was to use AI to make the network more self-healing and more self-sufficient in order to eventually manage itself. Colt is using AI-based automation

to handle service assurance and for the management and change control process, which will take multiple different phases. Colt will be moving several AI related proof-of-concepts forward into to 2019. In order to move the AI ball downfield, AT&T and Tech Mahindra announced in October of last year that they were teaming up on the AI and machine learning Acumos platform with the goal of putting it into open source. Acumos, which is hosted by the Linux Foundation's LF Deep Learning Foundation, was created to simplify the development of AI across a broad range of verticals while also providing a marketplace for accessing, using and enhancing AI apps. Acumos went live in March in conjunction with the Open Networking Summit. Expect several AI-related projects to emerge from Acumos next year.

# 5G to Take Center Stage At CES 2019

Analysts tipped 5G smartphones to be largely absent from CES 2019, but noted the next generation technology will still be a major force at the show as companies highlight its ability to enable new capabilities across automotive, IoT and entertainment. Though the first 5G smartphone launches are expected early this year, dominant players including Samsung, Huawei and LG are predicted to save their flagship debuts for MWC Barcelona or beyond, focusing instead on the launch of other products such as smart home devices, TVs and laptops at CES. But GSMA Intelligence head Peter Jarich said "at least one company will try to go out early and do a 5G device launch" at the show. He added: "We are in that window where 5G is new enough that it will be cool and newsworthy enough to do at CES. I suspect the same of WiFi 6." But limited handset launches won't stop 5G from being a pervasive topic at the show. The heads of US operators Verizon and AT&T

are set to tout the promise of 5G on the keynote stage on 8 January and 9 January, respectively, following the launch of their next generation networks in Q4 2018. Additionally, Strategy Analytics tipped 5G to feature prominently as an enabler of autonomous driving and in-vehicle entertainment technologies, as carmakers including Audi, BMW, Honda, Kia and Nissan show their latest wares. Ericsson will also host an autonomous driving

demonstration. Outspoken 5G proponent and chipmaker Qualcomm will also have a prominent presence at the show, as will rival Intel. CES 2019 officially kicks off on Tuesday 8 January, and will run through Friday 11 January. Mobile World Live will provide live coverage from the show as well as a video recap in the first Mobile Mix episode of 2019.
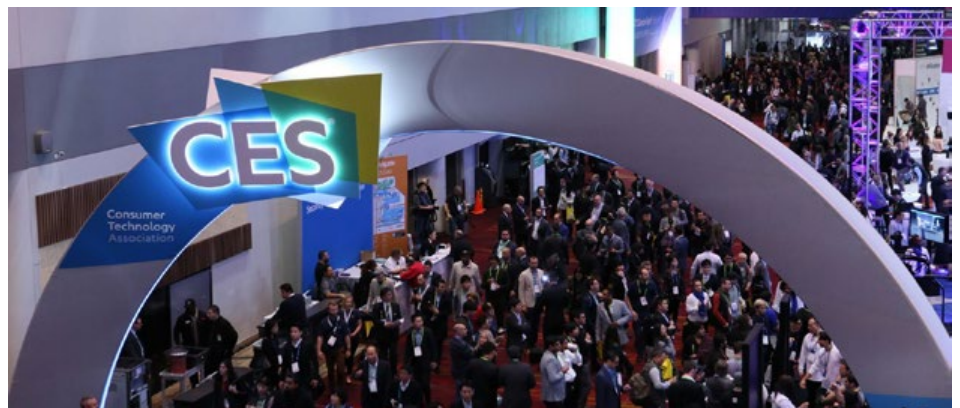
# New GSMA Intelligence Research Reveals Consumer Views on 5G and the Future of Devices

GSMA Intelligence, the research and consulting arm of the GSMA, has published the initial results of its latest Consumer Survey, providing a wealth of insight on consumer technology adoption trends set to shape the industry over the coming years. The new data forms the basis of two new GSMA Intelligence reports published at CES 2019. ' The Future of Devices ' focuses on the global adoption and changing uses of smartphones into the 5G era, plus the growing popularity of smart speakers and other emerging consumer device categories, while '5G's Great Expectations' examines what consumers are anticipating from the first wave of 5G network and device launches. "We are at the start of a new era of consumer devices that is being driven by advances in immersive reality and AI, creating a strong consumer appetite for products such as smart speakers and an important new battleground for the major tech players," said Peter Jarich, Head of GSMA Intelligence. "And while smartphones remain the dominant consumer technology, device vendors and operators are looking to 5G to unlock a new chapter in the smartphone growth story – even though our research suggests there is still work to do to convince consumers of the benefits of the move to 5G." Among the key findings from the 2018 GSMA Intelligence Consumer Survey:

- The smartphone is now a nearly ubiquitous consumer technology; almost 90 per cent of consumers in developed countries own a smartphone, with an average of 2.5 smartphones in every US household
- Alongside the smartphone, the range of connected devices (and therefore internet access channels) is now greater than ever. The average US and UK household, for example, now owns six connected devices – from TVs to consoles to emerging categories such as smart speakers

- Smart speaker ownership rates have nearly doubled in developed countries over the last 12 months. For example, 16 per cent of US households now own a smart speaker, compared to 9 per cent a year earlier. Amazon and Google continue to dominate this sector, together accounting for 85 per cent of sales units worldwide
- Despite the early hype, adoption rates of VR headsets in developed markets have remained flat year-on-year at around 6 per cent of households and have even dropped in some key markets such as the UK. AR applications in fashion, gaming and various enterprise sectors are more advanced at this stage
- More than half of consumers in developed countries (54 per cent) expect 5G networks to deliver faster speeds, suggesting that early 5G promotional activity will focus on network speed as a key differentiator (versus 4G) – but it is not clear if consumers will pay a premium for faster speeds
- Only one in four consumers (25 per cent) expect 5G to deliver 'innovative new services', and only 20 per cent believe 5G will usher in a new era of devices.

# Comtech EF Data Corp. Achieves another Industry Milestone by Enabling Gbps Throughput for LTE and 5G Backhaul

Comtech EF Data Corp. a subsidiary within Comtech Telecommunications Corp.'s Commercial Solutions segment, announced that it set a new industry performance record for General Packet Radio Services (GPRS) Tunneling Protocol (GTP) acceleration, enabling faster downloads and enhanced Quality of Experience (QoE) in LTE and 5G networks. As the mobile industry is preparing for the introduction of 5G, Comtech EF Data has enhanced its award-winning satellite modem and optimization portfolio to

support the most demanding mobile applications and services. The November 2018 Ericsson Mobility Report highlights that there are now 25 LTE-Advanced networks in the world supporting Gigabit download speeds. The report also states that with the introduction of 5G, user demand for mobile data services are expected to increase at a 31% CAGR until 2024. "Comtech is recognized as the performance leader in satellite backhaul infrastructure equipment," commented Richard Swardh, Senior Vice President,

Mobile Network Operators for Comtech EF Data. "With the latest additions to our portfolio, we are again demonstrating our commitment to supporting the most demanding mobile applications and services. Customers can be assured that by investing in our technology today, they have a solution that will grow and scale in line with ever-increasing demands for higher speeds as 5G is being deployed worldwide."

# Sprint Initiates First 5G Data Call on 2.5 GHz

Sprint says it has completed the world's first over-the-air 5G data transmission using 2.5 GHz and Nokia's Massive MIMO technology on the carrier's live network. The successful test comes as Sprint inches toward launching mobile 5G service in the first half of this year and awaits a pending, and now paused, FCC review of its proposed merger with T-Mobile. The milestone also comes less than a week after T-Mobile initiated the world's first 5G video call and data session on 600 MHz on its network in Las Vegas. Sprint says its field test was conducted in San Diego



using global 5G standards on a commercial 3GPP 5G New Radio (NR) network with the carrier's 2.5 GHz spectrum, Nokia's dual-mode AirScale Massive MIMO radio and a smartphone test device powered by Qualcomm's Snapdragon X50 5G modem. "The test demonstrated a seamless transition of connectivity between Sprint's 4G LTE Advanced and 5G network, while streaming YouTube videos, conducting Skype audio and video calls, and sending and receiving instant messages," the carrier wrote in an announcement. "This is a big step forward—Sprint 5G is now out of the lab and in the field as we prepare for our commercial launch in the first half of this year," John Saw, Sprint's chief technology officer, said in a prepared statement. "We're making great progress toward giving Sprint customers the first mobile 5G experience in nine top cities with the first 5G smartphone in the U.S." Sprint previously reported a successful 5G NR data transmission inside its lab in Reston, Virginia, using 2.5 GHz spectrum and Massive MIMO radios from Nokia and Ericsson. The carrier reiterated its goal of launching commercial 5G service in Atlanta, Chicago, Dallas, Houston, Kansas City, Los Angeles, New York City, Phoenix and Washington, D.C., by June.

# Ericsson, Qualcomm Complete 5G Data Call at 2.6 GHz

Ericsson and Qualcomm Technologies say they're adding a new frequency band to those that already have been successfully tested for commercial 5G deployment: 2.6 GHz. The companies said they achieved a non-standalone (NSA) 5G New Radio (NR) data call at 2.6 GHz on Dec. 20 at Ericsson's lab in Kista, Sweden. The bi-directional downlink and uplink data call is compliant with the 3GPP Release 15 "early drop" specification that was frozen in March 2018 and further stabilized in September; it constitutes the basis for commercial launches expected in the first half of 2019. "Together with Qualcomm Technologies, Ericsson continues to make strides on commercial 5G readiness by continuously performing interoperability tests on 5G NR networks on different spectrum bands. We're offering our customers flexible deployment options as they gear up for commercial 5G services," said Per Narvinger, head of Product Area Networks at Ericsson, in a press release. The press release didn't say which operators are planning to use 2.6 GHz, which is next door to Sprint's trove of 2.5 GHz, but China's Ministry of Industry and Information Technology last year awarded spectrum to China Mobile in the 2.6 GHz and 4.8 GHz bands.  Ericsson and Qualcomm's lab demonstration used Ericsson's commercially available 5G hardware—including its 5G NR radio AIR 6488 and RAN Compute products—along with Qualcomm's mobile smartphone form-factor test device powered by the Snapdragon X50 5G modem and antenna modules with integrated RF transceiver, RF front-end and antenna elements. Durga Malladi, Senior Vice President and general manager, 4G/5G at Qualcomm Technologies, said in a statement that Qualcomm is excited to continue working with Ericsson on 5G. "We are committed to helping ensure consumers get 5G devices

and experiences in their hands starting in the first half of 2019," he said. Qualcomm Technologies and Ericsson said they also completed similar Interoperability Development Testing (IoDT) on 28 GHz and 39 GHz millimeter wave bands, as well as on 3.5 GHz band based on the September specifications.mAlso in December, Huawei and Intel announced successful 2.6 GHz 5G NR IoDT based on the September version of 3GPP Release 15. They said it was the world's first 2.6 GHz 5G interoperability test under a standalone network. Operators in the U.S. in particular have been focused on getting more midband spectrum for 5G as other nations were quick to designate 3.5 GHz for 5G. The U.S. took a different tact when it comes to 3.5 GHz, setting up a unique Citizens Broadband Radio Service sharing paradigm, which is a big reason carriers are looking to the 3.7-4.2 GHz, or C-Band, to satisfy their midband 5G spectrum needs.

# Wi-Fi 6 with OFDMA Opens a World of New Wireless Possibilities

Wi-Fi 6, also known as 802.11ax, is viewed by many to be game changing, as it's the first major architectural change to the wireless LAN since its inception. Unlike other standards, which were just faster versions of the previous incarnation, Wi-Fi 6 is built from the ground up to support a world that is hyper-connected over Wi-Fi. To accomplish this, Wi-Fi 6 includes several new features and design enhancements.

**OFDMA enables more clients to connect to access points**

Many industry people discuss Wi-Fi 6 with believe the most important new feature is something called orthogonal frequency division multiple access (OFDMA), which allows multiple clients with varying bandwidth requirements to be connected to a single AP simultaneously. In actuality, a feature called orthogonal frequency division multiplexing (OFDM) does exist in older versions of Wi-Fi, but it was only for single transmissions. Wi-Fi 6 access points (APs) will be backwards-compatible and support OFDMA and OFDM. OFDMA takes a Wi-Fi channel and divides it into smaller frequency allocations known as resource units (RUs). This enables an AP to communicate with multiple clients by assigning them to specific RUs. Also, by subdividing the channel, applications that use small frames, such as video or audio streaming, can be transmitted to multiple endpoints simultaneously, which cuts down on overhead and congestion at layer two, improving application performance. OFDMA is highly flexible and can allocate the entire channel to a single client or sub-divide, depending on traffic.

**Users can expect better performance with Wi-Fi 6**

OFDMA should alleviate much of the unpredictability users



experience in highly congested areas. Consider a case where a person arrives several hours early to an airport gate and is one of only a few people in a small area. The user connects, watches something on Netflix, and sends out Tweets to their followers. Over time, the gate area gets crowded and the network becomes unusable. The most likely cause of this isn't bandwidth, but congestion from too many users. OFDMA will take care of this problem by enabling more clients to connect to a single AP simultaneously. Technically what's happening is that the channels are dividing up into subcarriers through some fancy mathematical functions. The spacing of these subcarriers is orthogonal (hence the O in OFDMA) preventing interference with subcarriers. With Wi-Fi 5, a 20 MHz channel consists of 64 312.5 kHz subcarriers with all of them being used to transmit data to a single client. Wi-Fi 6 operates differently and lets the space shrink from 312.5 kHz to 78.125 kHz, allowing for the number of subcarriers to increase to 256. The subcarriers are grouped into RUs, so an AP can subdivide a 20 MHz channel into 26, 52, 106, and 242 RUs. It's important to note that the AP controls how many RUs are used, as well as different combinations. For example, the AP can allocate the entire channel to serve one client, or it can partition the channel to communicate with multiple ones. This means the AP could communicate with one client over an 8 MHz sub-channel and then three others at 5 MHz, assuming all of the clients are Wi-Fi 6 capable.

**OFDMA enables up to 74 clients to connect to a single AP**

In addition to the 20 MHz channel, Wi-Fi 6 can partition 40, 80, and 160 MHz channels. Most businesses will configure the APs with 20 MHz channels, enabling up to nine clients to connect to an AP at once. In general, narrower channels are preferred to limit performance and reliability problems by minimizing channel interference. Theoretically, 74 clients could connect to a single AP, but this would be the exception more than the norm.

**Wi-Fi 6 will usher in a new era of applications**

The higher throughput combined with a more efficient network will enable businesses to run applications on Wi-Fi 6 that could not be run on wireless before. Video is typically used as an example, which is valid given 4k video has now arrived. More interesting use cases are immersive applications driven by virtual reality. What was once something for gamers is now being used in industrial design, retail, healthcare, and a number of other verticals? Wi-Fi 6 will open a world of new possibilities and OFDMA capability plays a key role in making this possible.

# Vodafone Unveils Beamforming Technology in 50 Rural Areas

Vodafone Germany has launched beamforming technology to enhance LTE connectivity in rural areas of the country. The antenna technology, which is being made available in 50 German communities, increases the capacity of a 4G mobile mast by five times. Vodafone says its customers in these areas will be able to benefit from the new technology both at home – via its GigaCube fixed line substitution product – and on the move.

# Optus Completes 5G Data Call Using 3.5GHz Spectrum

Australian mobile network operator (MNO) Optus has announced what it termed 'another significant step towards its commercial launch of 5G' following its successful completion of a data call using 60MHz of 3.5GHz spectrum. In a press release regarding the development, the cellco revealed that as part of pre-launch testing the call was made from an Optus 5G site in Dickson, Canberra, and utilized a commercial grade 5G radio network and customer premises equipment (CPE) developed in partnership with Nokia. Specifically, the MNO noted that the call was made using the 3GPP Release 15 September specification using a standard commercial chipset. Commenting, Dennis Wong, Optus' Managing Director Networks, said: 'We are on the cusp of delivering this next generation technology into the hands of our customers and hitting this milestone is an important step towards our commercial 5G launch planned for the first half of this year ... Using the 5G 3.5GHz band means that we will be able to deliver greater capacity compared to 4G, enabling

the use of multiple devices as well ultra-high definition video streaming which is expected to be key for our customers when 5G begins rolling out this year. This is the first time in Australia that a data call has been made using 60MHz channel bandwidth on an Optus live network and a 5G device.' With Optus expected to begin switching on its 5G network across several

capital cities in the first half of this year, the operator's multi-year 5G network build plan reportedly includes upgrading and adding new mobile sites while densifying the network with innovative small cell solutions which are designed to increase capacity and speed in highly populated inner-city locations.

# Dialog Axiata Pilots South Asia's First Live 5G Transmission with Sri Lanka Trial

Sri Lankan mobile operator Dialog Axiata has announced the commissioning of what it claims is South Asia's 'first fully functional and standards-compliant 5G transmission using commercial-grade base stations and end-user devices'. Local press sources have reported that the cellco's pre-commercial trial was fulfilled via a partnership with the industry

watchdog the Telecommunications Regulatory Commission of Sri Lanka (TRCSL), which is making available 3.5GHz band spectrum to pilot 5G. In the trials, Dialog reportedly achieved data speeds of more than 2Gbps in a live setting, with group CEO Supun Weerasinghe, noting: 'Reaching the milestone of enabling a fully functional pre-commercial 5G

transmission, as well as our investments in making a major part of our expansive island-wide 4G network fully 5G compliant, demonstrate our commitment to deliver to our customers network capability and digital enablement on a par with the most developed markets in the world.'

# Vodafone Unveils Beamforming Technology in 50 Rural Areas

Vodafone Germany has launched beamforming technology to enhance LTE connectivity in rural areas of the country. The antenna technology, which is being

made available in 50 German communities, increases the capacity of a 4G mobile mast by five times. Vodafone says its customers in these areas will be able to benefit from

the new technology both at home – via its GigaCube fixed line substitution product – and on the move.

# China Unicom and ZTE Claims to Complete the World's First 5G Call with ZTE's 5G Prototype Smartphone

ZTE Corporation, a major international provider of telecommunications, enterprise and consumer technology solutions for the Mobile Internet, announced that the Guangdong branch of China Unicom and ZTE have made the world's first 5G call by means of ZTE's 5G prototype smartphone in Shenzhen 5G field trial. The test also completed the verification of diverse services, such as Wechat group voice call, online video and web browsing. This achievement has made Shenzhen field of China Unicom become the world's first commercial test field to make the first call in the NSA mode and it is in compliance with the 3GPP Rel-15. Known as "the City of Innovation", Shenzhen is one of the first 5G pilot cities of China Unicom. Shenzhen is fully verifying the 5G network equipment's networking capabilities, special services, roaming and interconnection, and the inheritance of existing services in phases, thereby laying a solid foundation for the 5G whole network commercial construction. The test adopts ZTE's 5G end-to-end solution, including radio access network, core network, transport network and intelligent device, realizing the connection with ZTE's 5G prototype smartphone in the field environment. Meanwhile, the test has verified several 5G key technologies such as Massive MIMO, 5G NR, NSA dual connectivity, FlexE transport technology and 5G Common Core. As one of the world's leading telecommunications equipment providers, ZTE has been leading in 5G technology, 5G equipment and 5G product. The first call of ZTE's 5G prototype smartphone in the NSA mode conducted in ChinaUnicom Shenzhen field was successful. ZTE's 5G solution has passed the end-to-end test in the three months after the release of the 3GPP Rel-15. It showcases ZTE's strong competency in 5G R&D and commercialization, demonstrating ZTE's role as a reliable partner to global 5G operators and a key player in the 5G industry.

# German LTE Coverage, Speeds Lower than other European Countries - Study

German 4G coverage and speeds are lower than in other European countries, according to a study by the consulting firm P3 on behalf of the Green party. The average coverage in Germany is 59.5 percent compared to 93.5 percent in the Netherlands, 82.5 percent in Poland and 61.7 percent in Albania. The figures are based on data processed using an application on Android smartphones from July to September 2018. The LTE coverage by almost all network operators in the Netherlands, Belgium and Switzerland is more than 90 percent, while Deutsche Telekom in Germany scores 75 percent and Vodafone Germany just under 57 percent. The 4G network of Telefonica was not available for half of the analyzed data sets, according to the report. The three major German network operators score an average speed of less than 5 Mbps, while the highest is achieved by Swiss mobile networks with 10.5. The great majority of users (90%) in German mobile networks are therefore limited to speeds of less than 15 Mbps, while the 4G mobile network operators in Switzerland offer more than 25 Mbps for at least 10 percent of users.

## ARTICLE

# How Telecom Operators Can Make More From Their Data



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Telecom operators are in a prime position to monetize the data they generate from their clients. To do so they must take important strategic choices to formulate the right value proposition, business model, and go-to-market approach for this endeavor.

Data monetization normally entails collecting and processing information from customers and selling it in some form to third parties. The anonymized data, in categories such as age, location, or ethnicity, is either sold directly to clients or to aggregators, which combine data from multiple providers to improve their accuracy. The eventual beneficiaries of this information, private companies or government organizations, use it to improve their own performance through refining their understanding of customer behavior, and by boosting the success rate of commercial decisions.

Companies from many industries currently sell their data to clients. These could include insurance companies passing on bundled data on healthcare claims to pharmaceutical companies, or automotive firms providing car speed data to municipalities.

**Telecom operators are in a prime position to monetize the data they generate from their clients. To do so they must take important strategic choices to formulate the right value proposition, business model, and go-to-market approach for this endeavor.**

Nevertheless, telecom companies have several natural advantages over their peers when it comes to monetizing data. The greatest is the breadth and quality of the information they possess. Due to frequent interaction with customers, and near-continuous data on the whereabouts of phones, they hold richer information on customer profiles, locations, and communications usage than potential competitors such as over-the-top content providers.

There are three main ways to monetize data (refer to Figure 1). The first is through using the raw data. This could involve selling the raw information on its own, or after aggregating it with data

purchased from third parties such as market research organizations or data

**With governments throughout the GCC now placing big data at the heart of their modernization agenda, its impact on the regional economy is only likely to grow.**

analytics specialists. Alternatively, the telecom operator can sell its data through online marketplaces or application programming interfaces (APIs), which both allow for specific information in a desired format according to client need.

The second is by using applications. Telecom companies can provide a platform for third parties to host their own data and gain access to the telecom company information. Clients can build their own applications on the platform to profit from these data, perhaps through the targeting and segmentation of clients. Or telecom operators can develop their own applications that manipulate the data and help clients accordingly. For example, relevant applications could enable public transport authorities to plan and manage their services based on real-time traffic information.

The third is to monetize data through providing analytics services. In this approach, telecom operators sell the services of their own specialist data scientists and consulting professionals to clients.

Many telecom companies throughout the world have already started to capitalize on the opportunities afforded by data monetization. For example, Singtel has used data on customer profile, behavior, and location to help clients in Singapore identify the most productive positioning for their billboard adverts, and the most favorable timing of digital adverts for various products. Similarly, Telefonica has worked with retail operators to make the most of offerings and promotions in stores, and determine the optimum location for new branches. In the MENA and GCC region, telcos have started monetizing their data; for example, STC and Zain are building their big data analytics solutions to tackle specific use cases for enterprises. With governments throughout the GCC now placing big data at the heart of their modernization agenda, its impact on the

**Many telecom companies throughout the world have already started to capitalize on the opportunities afforded by data monetization.**

regional economy is only likely to grow.

It is up to each telecom operator to settle on the most appropriate way to monetize its data, either selecting one particular path or a combination. They have typically started by providing data APIs and developing applications to meet their clients' specific commercial goals. However, some have branched out to become end-to-end service providers, offering a one-stop shop of raw data, solutions, and other services.

Before finalizing their plans for data monetization, telecom operators must be able to answer a list of important questions regarding the value proposition, business model, and go-to-market strategy. What type of datasets should be offered? Should the data be sold directly to clients or to aggregators? Should a dedicated business unit be established for data monetization? What pricing system should be adopted? Which industries should be targeted?

Once telecom operators have successfully grappled with these and other issues, they can then set about exploiting their natural advantages in monetizing data, a commodity that is set to be increasingly valued throughout the GCC economy over the coming years.

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## REGULATORY NEWS

## TRA UAE Tweets Receive 6 Million Impressions in 2018

The Telecommunications Regulatory Authority (TRA) tweets on the social media platform "Twitter" received 64 million impressions in 2018, with more than 5613 tweets, as well as more than 302K visits to its Twitter profile. Moreover, TRA posted more than 1062 photos and videos on Instagram, receiving more than 89K "like" hits. On Facebook, the number of TRA page fans reached more than 61K fans.  These numbers reflect the great importance that TRA attaches to social media due to its important role in educating the public and highlighting their concerns, such as information security updates on WhatsApp and Snapchat, hacking, cyber blackmail, children addiction to smart devices, consumer rights in the ICT sector, training courses offered by the Center of Digital Innovation (CoDI), and the continuous
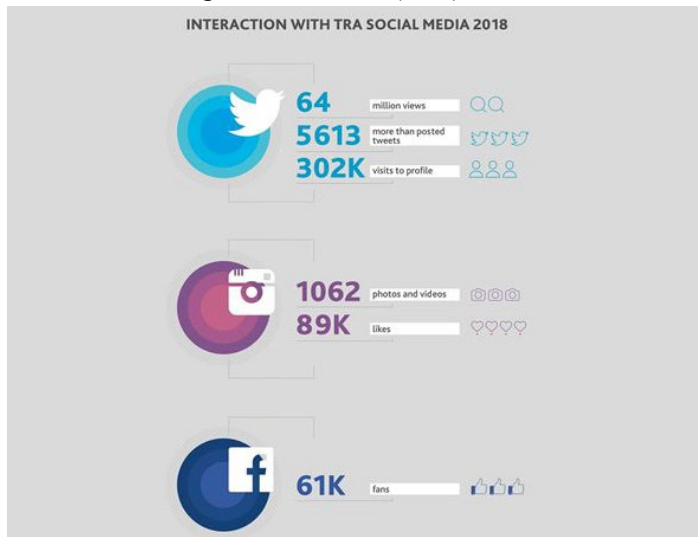


awareness of TRA services. TRA has adopted different methods in presenting digital content, ranging from images, graphics, awareness videos and weekly live episodes around the year addressing various information security and ICT related topics On the importance of social media for public awareness, H.E. Hamad Obaid Al Mansoori, TRA Director General, said: "In TRA, we use social media as part of an integrated strategy that employs all channels to achieve customers and society's happiness, inspired by the wise leadership experience in communicating with various social groups. We use social media to spread awareness, and to respond to public queries and comments about the ICT sector. In 2018, we launched several awareness campaigns in areas such as electronic security, cultural and social awareness, and children's safety. We will continue working on the same plan and developing it to accommodate the developments of 2019." TRA's interest in its social media accounts is based on realizing that the world today is facing a historic transformation in the media field, which is rapidly moving towards digitalization. TRA is one of the leading entities in using social media channels to communicate with the public. It interacts positively and actively with the public through these channels in accordance with the international best practices. TRA also adopts a social media policy that complies with the "Guidelines for eParticipation and Social Media for Government entities in the UAE", issued in January 2016.  TRA uses social media channels to receive the customers' inquiries, comments and opinions to improve the level of services and achieve customer happiness. Additionally, TRA uses social media tools in introducing its programs, initiatives, projects, smart services and awareness campaigns with regards to consumer rights and information security.

## Thailand Stands by 700MHz Auction Timeline

Thailand's National Broadcasting and Telecommunications Commission (NBTC) stuck to its guns over the timing of a 700MHz auction, rejecting a proposal to delay the process from May until December, Bangkok Post reported. An NBTC subcommittee previously proposed delaying the sale because the band won't be freed up until 2020, but the organization's board put its foot down, the newspaper stated. Seven 5MHz-blocks

of spectrum in the band will be sold. The 700MHz licenses have a 20-year term and the winning bidders are required to pay 20 per cent of the final price in the first year. Bangkok Post said the auction is generating international interest, with representatives from operators based in Malaysia and South Korea having met with NBTC Secretary General Takorn Tantasith to discuss potential participation. The companies are waiting for clarification on

auction terms and are unlikely to move forward if reserve prices are similar to previous auctions, Bangkok Post said. It noted Thailand's three major operators spent a combined THB270 billion ($8.5 billion) on 3G and 4G licenses. True Move, the country's second-largest operator, announced last week it doesn't plan to participate in the 700MHz auction.

# Bangladesh Regulator Launches IMEI Database

The telecom regulator will launch the first database of International Mobile Equipment Identity (IMEI) numbers of mobile phones in a bid to curb illegal import. Telecom Minister Mustafa Jabbar will inaugurate the database, established with support from Bangladesh Mobile Phone Importers Association (BMPIA), at the Bangladesh Telecommunication Regulatory Commission office. Customers intending to purchase a device can get the 15-digit IMEI by dialing *#06# from the handset. The legality can then be checked by sending an SMS with the IMEI to 16002. The IMEI numbers of handsets imported in 2018 have already been provided to the BTRC by mobile importers. That of new imports will be gradually added, said BTRC officials, adding that the database would also be used to automate the import process as all relevant procedures would be carried out digitally. "For the first time the government is getting a database which will also help ensure that tax is earned from this sector and gradually illegal imports will decline," said Mohammad Mesbah Uddin, joint secretary of the BMPIA. The database will enable the government to know the types of handsets being used in the country and how many are 4G and 3G-enabled and basic phones, said Mesbah, also the chief marketing officer of Fair Group, which assembles Samsung devices. Industry insiders said the database would also give the

government the capacity to switch off handsets. The government also plans to set up a National Equipment Identity Register, which will save individual IMEI numbers with their associated SIM and national identity card numbers. About 3.35 crore handsets were legally imported in 2018 while one crore entered through different sources, including illegal imports.



# Proposed Amendment to Allow Aadhaar Use for Telecom

The Indian government has introduced a bill in the Lok Sabha (the lower house of parliament) that would allow individuals to use the Aadhaar biometric identification system as a means of verifying their identity for certain services, including purchasing a SIM card. The Economic Times writes that the 'Aadhaar and Other Laws (Amendment) Bill 2018' put forward by IT Minister Ravi Shankar Prasad would amend three existing laws to allow for the voluntary use of the Aadhaar system for certain services. The legislation would update the guidelines for Aadhaar use and provide clarity after a Supreme Court decision in September



last year left the system in disarray. As previously reported by TeleGeography's CommsUpdate, the nation's cellcos were caught up in a policy U-turn by the apex court, which had ordered the mandatory re-verification of subscriber lines via the new Aadhaar system in February 2017 but reversed the decision in September 2018 following a series of legal challenges to the scheme. The September ruling removed a section of the Aadhaar Act that had allowed private companies to ask for Aadhaar details for identification, preventing cellcos from using the system at all, and forcing them to fall back on alternative means of verifying a customer's identity. The proposed amendment, meanwhile, sets out a framework that would give customers the option to use Aadhaar to sign up for certain services if they wish. In addition, the bill establishes measures to protect individuals' data – one of the primary concerns that had led to the Supreme Court's policy reversal. Under the proposed guidelines, providers would be required to inform potential customers of other available means of ID verification and would be barred from denying a would-be user service for refusing to use authentication via Aadhaar. Verification via Aadhaar would only be permitted for companies that are compliant with the ministry's standards for privacy and security. Further, strict penalties were outlined for those that violate the act, including prison terms for misuse of customer data.

# Forty CEOs Back Launch of Digital Declaration at Davos

The GSMA launched the 'Digital Declaration' at the World Economic Forum in Davos. The declaration captures key principles that serve as a guide to acting ethically in the digital era, helping companies deliver what matters most to digital citizens, industry and governments. The 40 business leaders who have already committed to the declaration span several industry sectors and include representatives from: Bharti Airtel, China Mobile, China Telecom, Deutsche Telekom, Ericsson, IBM, KDDI, KT, LG Electronics, Mobile World Capital Barcelona, Nokia, NTT DOCOMO, Orange, Samsung Electronics, Sharp, SK Telecom, Sony Corporation, STC Group, Telefónica, Turkcell, Verizon, Vodafone and Xiaomi. The initiative has arisen against a backdrop of businesses and consumers experiencing unprecedented change in the digital world. It is expected that by 2022, 60 per cent of GDP will be digitized. The imminent arrival of 5G networks will further accelerate this change. At the same time consumers are rightfully expecting more from digital services, while their trust in businesses is being tested. The Digital Declaration is a cross-industry movement of CEOs confronting these shared challenges. Its principles call on businesses to; respect the privacy of digital citizens; handle personal data securely and transparently; take meaningful steps to mitigate cyber threats; and ensure everyone can participate in the digital economy as it develops whilst combatting online harassment. Taken together, these commitments will ensure the internet is kept as an open platform for expression and a driver of innovation. "Social, technological, political and economic currents are combining to create a perfect storm of disruption across all industries," said Mats Granryd, Director General GSMA. "A new form of responsible leadership is needed to successfully navigate this era. We are on the cusp of the 5G era, which will spark exciting new possibilities for consumers and promises to transform the shape of virtually every business. In the face of this disruption, those that embrace the principles of the Digital Declaration will strive for business success in ways that seek a better future for their consumers and societies. Those that do not change can expect to suffer increasing scrutiny from shareholders, regulators and consumers." "A positive and enabling digital future is integral to a truly empowered and inclusive society," said Sunil Bharti Mittal, Chairman of Bharti Airtel – the first business leader to sign the Digital Declaration. "Such a future can only be built through constructive collaboration and continuous dialogue among key stakeholders. It is imperative for industry to make the required investments to build a sustainable digital ecosystem and maintain citizen's trust through transparent and responsible conduct with regard to privacy and data." "Backing The Digital Declaration fits into our vision to enable a progressive, free and enlightened society," said Stéphane Richard, Chairman and Chief Executive Officer of Orange, and Chair of the GSMA. "Orange fights digital exclusion with innovations that are accessible to the greatest possible number of people. We secure and facilitate our customers' digital lives thanks to our expertise in cybersecurity and in digital identity. Joining the Digital Declaration provides us with a shared vision of acting responsibly as we help our customers enter the eras of artificial intelligence and of the internet of things." Mobile is one of the most widely deployed technology platforms ever with more than 5 billion unique mobile subscribers worldwide, representing approximately two-thirds of the world's population – forecast to grow to almost 6 billion (71 per cent) by 2025. Representing the mobile industry globally, the GSMA is at the heart of many of the technological innovations already shaping tomorrow's digital society, including 5G. The industry body has worked with business leaders to shape the declaration to demonstrate the private sector's commitment to responsible leadership at a time when policymakers are facing new challenges from the evolving digital ecosystem. As we move into an era of Intelligent Connectivity, the combination of endless connectivity enabled through 5G and the Internet of Things, with the powerful intelligence delivered by big data and artificial intelligence will further transform entire industries. Through embracing the Digital Declaration, CEOs are showing their commitment to acting responsibly as they keep pace with this rapid rate of technology change. The GSMA is inviting business leaders from any sector to join the Digital Declaration and ask themselves what role they can play in creating a better digital society.

# Ugandan President Criticizes MTN License Fee

Ugandan President Yoweri Museveni has said he is 'astonished' that the local telecoms regulator, the Uganda Communications Commission (UCC), has renewed the operating licence of MTN Uganda at a lower fee than originally announced. The firm has paid USD58 million for the ten-year renewal instead of the USD100 million fee which was set initially. The reduction has reportedly come after MTN said it would have to invest at least USD200 million to meet the conditions of a new national broadband policy, which aims to improve internet connectivity in rural areas. A report from Reuters says President Museveni has written to the country's ICT Minister and the Attorney General to say that he was 'astonished' by the UCC's decision. He said that South African-owned MTN Uganda had 'reaped vast profits, most of which have obviously been repatriated'. It has been suggested that MTN is required to list shares on the local bourse as part of the conditions for the renewal, though this has not yet been confirmed by the cellco.

# EC Targets 3.6GHz Harmony in 5G Push

The European Commission (EC) announced it will harmonize spectrum in the 3.6GHz band for 5G, a move designed to boost deployment of the technology in the continent. In a statement, the EC said the move will enable member states to use the frequency band for 5G by 31 December 2020, adhering to rules set out in the EU's new Electronic Communications Code, which was cleared in December 2018. The Commission explained the band has been harmonized for wireless broadband services in the union since 2008, "however its use has been low and only a limited number of licenses" had been issued. It has now amended technical conditions to "make them 5G-ready, as the 3.6GHz band has been identified as the primary pioneer band for 5G in the EU". However, it added the 3.6GHz band has no exclusive mandate to be used for 5G, and the decision to harmonize the band was based on the principle outlined in the code of ensuring "technology and service neutrality". The progress of 5G will also be driven by two pioneer bands (700MHz and 26GHz), as well as further spectrum in existing EU harmonized bands below 6GHz and new spectrum in mmWave. The EC said it decided to harmonies the band for 5G after receiving positive feedback from member states that are part of its Radio Spectrum Committee. Once the Electronic Communications Code comes into force, "radio spectrum will be assigned and coordinated even better at EU level than at the moment so that Europe can become a leader in the rollout of 5G networks", the EC said. The move will be complemented by similar harmonization initiatives in the 26GHz and 700MHz bands, which are ongoing.

# NCLT Green Lights Tata Takeover

India's National Company Law Tribunal (NCLT) has approved the acquisition of Tata Teleservices Limited (TTSL) by Bharti Airtel, leaving clearance from the Department of Telecommunications (DoT) as the only remaining regulatory hurdle for the deal, the Economic Times reports. Airtel signed an agreement in October 2017 to take over Tata's consumer mobile business on a cash-free and debt-free basis. Airtel had originally been expected to pay around 15%-20% of the roughly INR100 billion (USD1.4 billion) in remaining spectrum liabilities for TTSL, but the DoT had requested further clarity on the arrangement, and in October last year Tata and Airtel said that the latter company would take on the payment, covering license fees, spectrum usage charge and one-time spectrum charges. TTSL's parent Tata Sons would fund the payment, however. Through the acquisition Airtel will gain access to Tata's subscriber base – which totaled 22 million users at the end of September 2018 – and a portfolio of 178.5MHz of spectrum across the 850MHz, 1800MHz and 2100MHz bands.

# Vodafone Idea Calls for Moratorium on Spectrum Payments

Indian cellco Vodafone Idea has requested a two-year moratorium on spectrum payments due to its high debt levels, the Economic Times writes, citing a senior government official. The operator is reportedly expected to pay around INR100 billion (USD1.4 billion) in fees related to its spectrum holdings this year. According to the unnamed source, the request is being considered by the Department of Telecommunications (DoT) and other ministries and departments. Vodafone Idea's appeal reiterates similar submissions made by the industry in recent years – including filings in November and December last year from the Cellular Operators Association of India (COAI) and Associated Chambers of Commerce and Industry of India (ASSOCHAM), respectively – as intense price competition has negatively impacted service revenues whilst spectrum prices have remained consistently high. The Economic Times cites industry bodies as stating that the sector has lost 42% of its quarterly sales revenue between April-June 2016 and July-September 2018. The debt pile for four cellcos, meanwhile, was said to total around INR5 trillion, 60% of which was attributed to spectrum payment obligations.

# Winning with 5G: Considerations for Telecom Operators

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In many ways, 2018 was the year when the telecom industry globally and in the SAMENA region prepared for the next big technology leap with 5G.  The industry body 3GPP finalized the first 5G New Radio standard with Release 15, technology suppliers launched 5G network products, regulators clarified their plans for the 5G spectrum, several SAMENA Telecom Operators piloted 5G networks, and the broader ecosystem players experimented with 5G use cases. These developments from all industry stakeholders have prepared the market for the first commercial 5G launches in the SAMENA region.

> **Although it will still be a few years before 5G becomes the mainstream communication technology, telecom Operators will need to play the lead role in 2019 to bring to market both consumer and enterprise 5G applications.**

Although it will still be a few years before 5G becomes the mainstream communication technology, telecom Operators will need to play the lead role in 2019 to bring to market both consumer and enterprise 5G applications. They will need to decide their 5G strategy for not only how to deploy but most importantly how to optimize and monetize their investments.
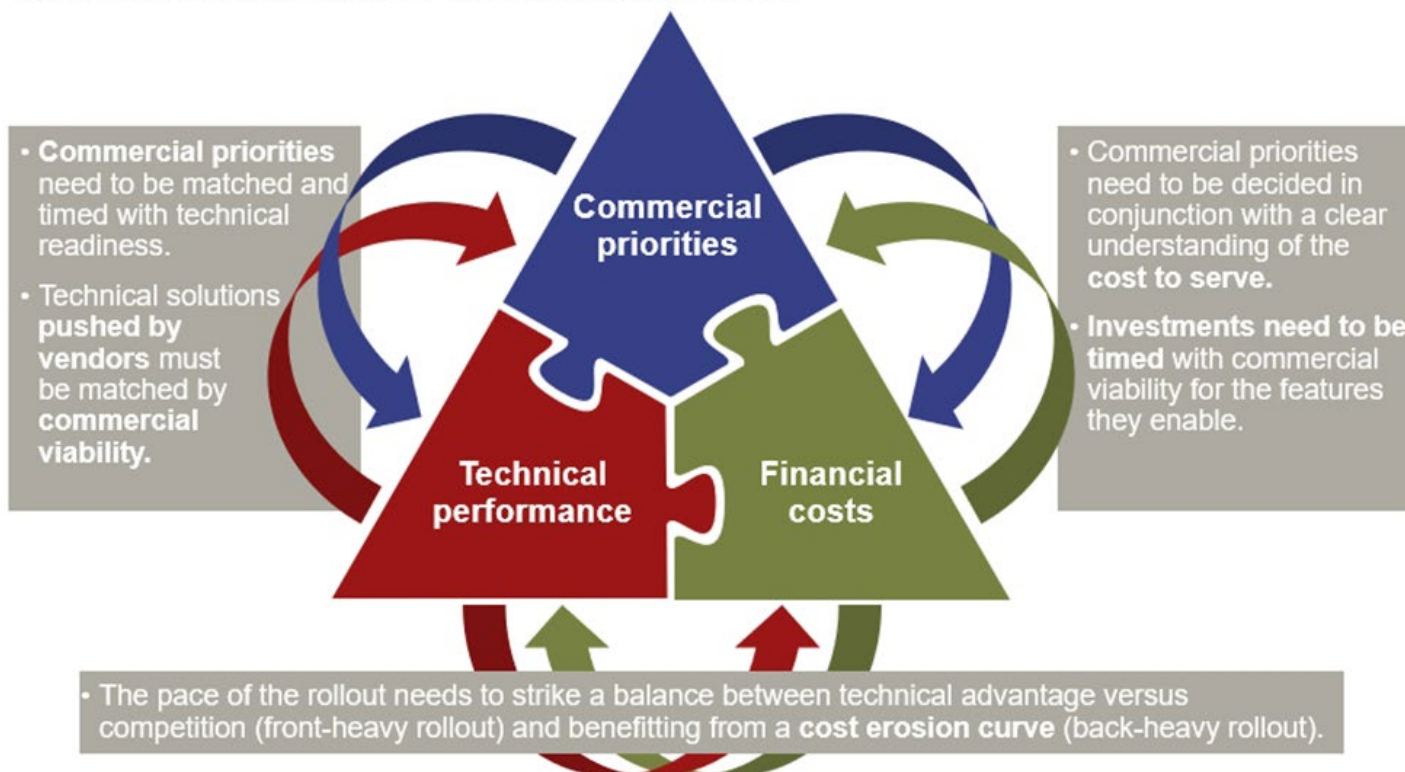
There are several important considerations for telecom Operators to maximize value from their 5G investments, along three main areas (see figure):

- Commercial priorities: What propositions can be launched to monetize 5G and with which ecosystem partners?
- Technical performance: Which technology choices will enable the most efficient 5G network rollout?
- Financial costs: How can telecom Operators negotiate the most favorable agreements with 5G technology suppliers?

Each operator needs to assess its market and its individual situation to make the best choices for a successful foray into 5G.

## Key considerations for deciding the extent and pace of a 5G rollout



- **Commercial priorities** need to be matched and timed with technical readiness.
- Technical solutions **pushed by vendors** must be matched by **commercial viability**.

**Commercial priorities**

**Technical performance**

**Financial costs**

- Commercial priorities need to be decided in conjunction with a clear understanding of the **cost to serve**.
- **Investments need to be timed** with commercial viability for the features they enable.

- The pace of the rollout needs to strike a balance between technical advantage versus competition (front-heavy rollout) and benefitting from a **cost erosion curve** (back-heavy rollout).

Source: A.T. Kearney analysis

### Commercial Priorities: Monetizing 5G

As the industry learned during the transition from 3G to 4G, the incremental monetization for telecom operators from faster speeds was short-lived at best. New use cases co-created with a broader ecosystem of partners from various industry sectors will be essential for operators to maximize the value of their 5G investments. Operators must understand and assess the use cases to choose the ones that are relevant for their individual markets based on the maturity of the ecosystem and consumers.

At A.T. Kearney, we have assessed more than 60 use cases covering mobility, manufacturing, media and entertainment, health, farming, and smart city applications, evaluating their ability to go mainstream and their 5G requirements (see figure). Globally, what we found is that the use cases with the highest requirements for 5G are mostly in business-to-consumer media, especially in augmented and mixed reality and in mobility, where highly automated vehicles will influence demand in the foreseeable future. In the SAMENA region, one of the key applications would be in enabling Industry 4.0 across various industries.

Hence, operators in the SAMENA region need to do major groundwork in 2019 to identify the use cases they want to deploy and in which sectors, determining the commercial proposition. They will need to find and join forces with ecosystem partners to go to market together and develop a pricing strategy to monetize their 5G investments.

Technological Performance: Deploying 5G While 5G brings distinct advantages of ultra-high data throughput and ultra-low latency with high reliability, it also requires an ultra-dense network deployment and a new network architecture that is highly virtualized to allow slicing to suit individual use case. This will require telecom Operators to make massive investments in 5G deployment at a time when they also need to continue expanding their 3G and 4G networks, which will remain relevant for many years to come.

Based on our experience with 5G-related projects over the past few years, we know that operators will need to make many pragmatic technological choices. A value-based rollout of a 5G network using deep analytics-driven decision-making to prioritize deployment in areas

**At A.T. Kearney, we have assessed more than 60 use cases covering mobility, manufacturing, media and entertainment, health, farming, and smart city applications, evaluating their ability to go mainstream and their 5G requirements**

with the highest monetization potential will be essential. Operators also need to fundamentally rethink their infrastructure-sharing strategies in a denser network realm and work with TowerCos plus new partners that own urban infrastructure assets such as Utility and Transport providers. And then there are broader radio technology strategy decisions to make, including turning off legacy networks such as 3G.

### Financial Costs: Sourcing 5G

Telecom operators' return on any 5G investment will primarily depend on their ability to source 5G effectively. Operators will need to develop a comprehensive
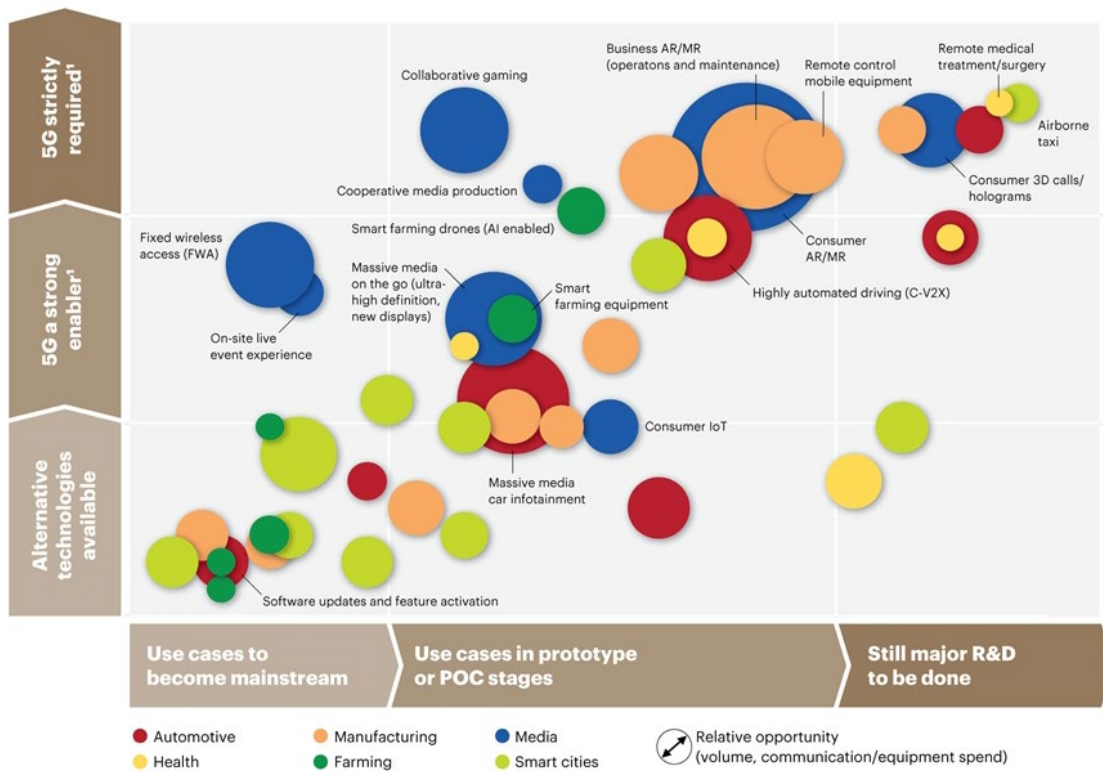
Source: A.T. Kearney analysis

**Operators also need to fundamentally rethink their infrastructure-sharing strategies in a denser network realm and work with TowerCos plus new partners that own urban infrastructure assets such as Utility and Transport providers.**

approach to sourcing 5G, which begins with agreeing on the pace and extent of the rollout, managing technology interdependencies, and balancing short-term benefits versus the long-term cost of ownership (see figure).

Looking to secure a dominant market position, network technology vendors are eager to push 5G now, courting operators with lucrative deals including bottom-page discounts, free equipment, and engineering and rollout support. However, these incentives are typically one-off, do not include cost-erosion mechanisms, and are offered in exchange for long-term contracts. Operators need a robust method for comparing the full value in pursuing

such long-term commitments early on, rather than assuming a higher cost up front to maintain competition down the road. Further, to best manage the growing interdependencies between different network and IT categories, Operators should develop and apply what A.T. Kearney calls a "mega-vendor" strategic sourcing approach, in which the scope of network and IT categories are bundled into one overarching negotiation process.

**Conclusion**

In 2019, as operators commit massive investments to 5G, they will need to make many wise commercial, technological, and financial decisions. These decisions cannot be made in siloes but require a cross-functional 5G task force with participation from all organization areas, including marketing, product development, technology, finance, and procurement as well as engagement with wider ecosystem partners and industry experts. Operators that define a comprehensive 5G strategy early on and guide its effective execution by engaging the best talent internally and externally will win in the race to 5G.



5G sourcing approach overview
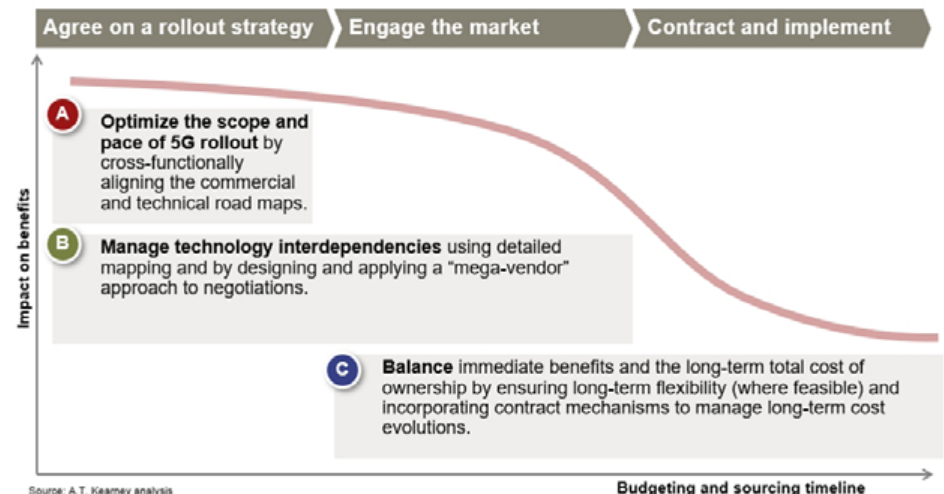
# A SNAPSHOT OF REGULATORY ACTIVITIES IN SAMENA REGION

## Afghanistan

Afghanistan's much awaited and ambitious fiber optic connectivity project is at its final stage and is estimated to be completed in seven months. Officials from the Afghan Telecom expressed their hope in slashing internet service prices once the fiber optic network is commissioned and put into operation. The project will connect Afghanistan and China via Wakhan port. Afghanistan is connected to five of its neighbors by optical fiber cables, but technical issues within the country are reasons for slow internet services and high consumer prices. Afghan Telecom official said the Ministry of Communications and Information Technology is working on the implementation of the Wakhan corridor project and is also undertaking many other similar projects to connect his country with neighbors. One example is the Silk Route fiber-optic network connecting Tajikistan and Kyrgyzstan.
(January 5, 2019) fomsn.com

## Bahrain

The Telecommunications Regulatory Authority's (TRA) Board of Directors held their last meeting of 2018, at TRA's headquarters. During the meeting, Board members discussed key issues related to the telecommunications sector in; praising TRA's outstanding efforts in the development and growth of the telecommunications sector in the Kingdom of Bahrain. The Board also commended TRA on promoting its performance to the highest levels of excellence and innovation and stressed on continuing to work in a transparent manner in dealing with all the sector-related issues, as well as on its position as an exemplar regulator in all its initiatives and strategies at a regional and international level through constructive cooperation with the international organizations. The Board of Directors expressed their thanks and appreciation to the TRA team members for their support and professionalism and outstanding role in developing the sector. This came as a result of the hard work and persistence of the highly professional team members that this was made possible.
(January 16, 2019) tra.org.bh

The Telecommunication Regulatory Authority (TRA) of Bahrain has published a consultation report document on the award of Spectrum in the 800 and 2600 MHz bands.  This document provides detailed responses to the comments received by the TRA in the context of the public consultation. The consultation was issued on 14 August 2018 and sought stakeholders' views on the process for awarding spectrum in the 800 MHz and 2600 MHz bands. Stakeholders were asked to submit their comments in response to the Public Consultation Document not later than 13 September 2018. Based on requests for extension received, this deadline was subsequently extended to 25 October 2018. Within the provided deadline, the TRA received comments from five respondents (Batelco, Viva, Zain, SAMENA and Huawei), which availed themselves of the opportunity to provide their opinions on the award process. The TRA in this document has included a table of the comments received for the specific questions formulated in the consultation document, and the Authority's response to these comments. Some respondents have submitted confidential information to support the arguments presented in their response – such information are noted by the Authority, but have not been included in the summary below. SAMENA Telecommunications Council provided general comments on the scope for cross-border interference, alerting of the risks that would arise if Bahrain were to use the 2600 MHz band for FDD and KSA opted for TDD and recommending prior coordination with neighboring administrations and using trigger field strengths in CEPT/ECC recommendations. These comments are noted by the Authority. However, it did not provide specific comments to any of the questions formulated in the consultation document, and thus is not included in the summary of responses.
(January 1, 2019) tra.org.bh

# Bangladesh

Bangladesh Telecommunication Regulatory Commission has initiated a move to adopt latest version of IP (internet protocol) addressing system that would allow the regulatory body along with other government agencies to monitor internet users more accurately, said BTRC officials. Scarcity of IP addresses under the existing version of IP addressing system along with the gradual adaptation of new version of IP addressing system to end the IP address scarcity were among other reasons for the government's move to implement the news IP addressing system, a BTRC official said. To implement the new version of IP addressing system, the telecom regulator has already formed a study group headed by its Director General Brigadier Md Mustafa Kamal. Two meetings of the committee were held on December 11 and 23 last year where representatives from mobile network operators, internet service providers and international internet gateway operators were present. Identifying problems in adopting the new version was among other responsibilities of the working group. A member of the committee told New Age on Wednesday that the committee had already asked the mobile phone operators and internet service providers to specify the potential problems in adopting the new version of IP addressing system. The operators were also asked to mention specific time that would be required for implementing the latest version. On the other hand, IIG operators are already capable in supporting the new version as it was made mandatory in their licensing guidelines. The commission would not scrap the existing IP addressing system at once as many of the web sites and services are not capable to provide services with the new version of IP addresses. The commission would run both the versions simultaneously and allow everyone to shift to the new system. The new version, known as IPv6, which has been under development stage since 1995 as the existing version, known as IPv4, was in the final stage of exhausting due to rapid increase in internet use. In July, 2017, the final definition of the protocol IPv6 was published, designed as a replacement for IPv4 which has been in use since 1982. In Bangladesh, the country's all the internet service providers including the mobile phone operators are using IPv4 for addressing purposes, a barrier for issuing dedicated IP address to each user. Under the existing IP addressing system in Bangladesh, IP address of a devices, from which internet is used, may change within a certain period of time as majority of those are not dedicated IP address as the IPv4 addressing system has address limitation, said BTRC officials. As per the 32 bits numbering system in IPv4, highest 429.5 crore IP addresses could be issued worldwide whereas the 128 bits IP addressing system IPv6 would allow issuing dedicated IP addresses for all the devices which would be used in future. Issuance of dedicated IP address for each device, to be connected with internet, would allow law enforcing agencies detecting a particular internet user faster considering the times taken by them now. The telecom regulator has already asked all the MNOs and ISPs to submit by January 28, 2019 individual roadmap in implementing IPv6.

(January 19, 2019) newagebd.net

The Bangladesh Telecommunication Regulatory Commission (BTRC) has commenced the initial preparations for awarding 5G mobile data licenses to operators in 2020. BTRC Commissioner for Spectrum Management Md Aminul Hassan said that 'the BTRC would have to do a lot of work this year to ensure smooth 5G service in 2020,' adding that the regulator has asked all mobile network operators to give presentations regarding 5G technology. The first test run of 5G technology in Bangladesh took place in July 2018 in Dhaka, showcasing download speeds of up to 4.17Gbps. The trial was conducted by equipment vendor Huawei and local cellco Robi Axiata, in cooperation with the Ministry of Posts, Telecoms & Information Technology (MoPTI). The demonstration aimed to show how a 5G ecosystem can be cultivated in the 'Digital Bangladesh' project. (January 17, 2019) The Daily Star

The telecom regulator's revenues rose 58.51 percent year-on-year to Tk 6,445.36 crore in the last fiscal year, a four-year high backed by earnings from the sales of 4G spectrum. Bangladesh Telecommunication Regulatory Commission (BTRC) raked in Tk 4,066 crore in 2016-17 and Tk 4,207.94 crore in 2015-16. More than half of the revenue, or Tk 3,520.64 crore, came from the spectrum sales to mobile phone operators in February last year. "Certainly, 4G spectrum auction paved the way for the higher revenue last fiscal year," said Md Jahurul Haque, acting Chairman of the BTRC. In 2017-18, the telecom regulator earned Tk 2,501.50 crore in revenue shared by all telecom service providers, the second largest contributor to the earnings of the BTRC. It was Tk 2,648.90 crore in 2016-17. "Revenue sharing is a fixed source of income for us though the amount is almost stagnant or has declined in some cases," Haque told. He said people were increasingly using communication applications to make voice calls, so the government's earnings from revenue sharing by mobile phone operators would fall in the coming years. Mobile operators share 5.5 percent of their gross revenue with the BTRC. International gateway operators share 40 percent of what they earn from incoming international calls and interconnection exchanges share 67 percent of their revenues. Earnings from incoming international calls dropped by a few hundred crore taka, said a senior official of the BTRC. The revenue from incoming international calls is on the decline for a number of reasons and one of them is the formation of a cartel of international gateway operators a couple of years ago, the official said. The third highest contributor to the BTRC's revenue was annual charge for license, which amounted to Tk 99.67 crore last fiscal year. Some Tk 98.77 crore came from other sources. It collected Tk 23.45 crore in late fees and Tk 20.20 crore in fines against illegal activities of the operators. In the year, the BTRC spent about Tk 70 crore for administrative purposes from the collections and deposited the rest to the national coffer. The telecom regulator also has a huge amount of unrealized income but it is finding hard to collect those as the debtors are either government-run entities or politically-backed companies, said an official of the BTRC's finance division.

Of them, international gateway operators owe about Tk 1,100 crore to the BTRC. State-run mobile phone operator Teletalk has been providing 3G services since 2012 but has not obtained a license as it has paid only Tk 60 crore out of Tk 1,627 crore needed to pay in license and spectrum fees. Another state-owned telecom company Bangladesh Telecommunications Company Ltd owes the BTRC Tk 1,600 crore. Private land-phone operators, most of which have gone out of service in the last couple of years, owe about Tk 100 crore. (January 5, 2019) thedailystar.net

In an attempt to ensure the much-awaited improvement in and proper quality of service (QoS) in the telecom sector, the regulator—the Bangladesh Telecommunication Regulatory Commission (BTRC)—has chalked out plans to assign the responsibility to a third party. In this respect, the telecom regulator has floated a tender to select the third-party company. The BTRC recently sought a request for technical proposal to analyze the quality of service (QoS), revenue collection of operators, and preservation and analysis of data and voice through a third party. The tender circular, named the International Tender for Telecom Monitoring System (TMS) of BTRC, was signed by BTRC Director (Engineering and Operations) Golam Razzaque. The project will be run with government funding. According to the BTRC, the telecom regulator will implement six services viz. design and development of a complete monitoring (of network, voice and data traffic, CDR, subscriber, services, etc.) system, as outlined in the tender documents; integration of the revenue reporting process and the automated audit system in the proposed system, in line with BTRC regulations; development, deployment, acquisition and installation of necessary software and hardware to implement the proposed system; ensuring the scalability of the system for future expansion aimed at incorporating all telecom operators; one-year operation and two-year maintenance of the system; and training of BTRC officials to ensure efficient use of the system. The last date of sales of the tender document is 03.02.2019. Razzaque told reporters that interested local and international IT firms are invited to prepare and submit the technical proposal, demonstrating that they have understood the scope of work

and are capable of delivering the telecom monitoring system, as outlined in the tender document. "The firm must have sufficient competency and experience in developing and implementing telecom compliance management and auditing system(s) and big data analytical platforms for telecom operators," he added. Former Post, Telecommunications and Information Technology Minister Mustafa Jabbar had said the government was working to ensure QoS and no negligence would be tolerated. Earlier, in April, the BTRC finalized a new set of regulations under which telecom and internet service providers will have to pay a penalty for non-compliance with the service standards set by the regulator. The new regulation was gazetted on November 11. BTRC Chairman Zahrul Haque said the new regulation will help customers get better quality of service. According to Section 3(D) of the new regulation, "The BTRC may, on a random basis or in keeping with complaint(s) regarding the QoS issue on a specific zone or area, from time to time through inspection, sample test (or any other measurement method), either by its own officers or employees or through an agency appointed by it or joint measurement conducted with service providers, verify and asses the performance of service providers against the QoS benchmark of each parameter for telecom services." The gazette states that the BTRC has fixed the time for disposing of customer complaints relating to mobile phone bills within 28 days. The BTRC has received a number of customer complaints in recent times about the QoS of the four telecom operators of the country. Bangladesh Telecommunication Regulatory Commission (BTRC) will activate "100" as new short-code Feb 25, 2018 replacing the existing one to hear complaints. "The new three-digit short-code '100' eased the operation of Complaints for Telecommunication Service (CTS) call center," BTRC Secretary and Spokesperson Sarwar Alam said that time. Complaints Management Taskforce (CMT) is assigned to oversee the CTS for solving the complaints of customers and taking effective measures, he added. Earlier in 2016, telecom regulator introduced short-code "2872" to hear the complaints of mobile phone, internet and other telecom related users. But, now it was deactivated following the opening of new short-code. (December 30, 2018) theindependentbd.com

# Egypt

The Minister of Communication and Information Technology Amr Talaat said in statements to Masrawy website that the ministry is currently implementing a plan to double internet speeds throughout the country. The plan involves upgrading communication cabins, cleaning copper cables of oxidation, and replacing copper wires with fiber-optic cables, which allow faster DSL and fixed broadband connections. The minister noted that central to the success of the plan is maintaining intra networks and replacing routers. In 2018, Telecom Egypt set up 5,800 new multi-service access node (MSAN) cabins in the country, bringing the total number of cabins to 17,800. A source in Egypt's primary telephone company Telecom Egypt said that the company is working on a plan to install fiber to the home (FTTH) in newly

constructed cities and urban communities. Some 85 percent of the work to replace copper wires with fiber-optic cables should be completed before the end of 2019. The entire internet infrastructure development plan is set to be complete by 2022, a company source told Masrawy. Egypt ranks near the bottom of the list of countries for internet connection quality and speed, according to tests carried out by Speedtest, Akamai Technologies and OpenSignal, the three top agencies measuring internet quality, with some results showing that internet speeds in Egypt are slowing down. This is in spite of increases in the number of internet subscribers and the launch of infrastructure projects to raise internet quality. The results come at a time when the Ministry of Communications and Information Technology has announced its readiness to

provide 5G Internet services in the country. Speedtest reported that in November 2017, Egypt's internet speeds had increased to reach 9.07 MBps after it measured those offered by commonly used internet service-providers such as WE, Nile Online, Vodafone Egypt, Orange, Link and Telecom Egypt. In a report published in 2018, Speedtest stated that Egypt's infrastructure had suffered from a lack of investment following the 25 January Revolution. The service started seeing improvements in the third quarter of 2016, but Egypt still ranks 146 out of 150 countries for fixed broadband download speeds and 95th for mobile internet, Speedtest said. In recent years, many public and social media campaigns demanded raising internet speed and quality as well as reducing internet fees. Out of Egypt's then-population of 104 million, an estimated 4.2 million use ADSL services while 27.4 million access the internet via their mobile phones, according to June 2016 figures

by the state statistics authority CAPMAS, released in 2017. ADSL internet prices in Egypt range between EGP 110 for 5 mbps and EGP 700 for 100 mbps per month.

(January 22, 2019) english.ahram.org.eg

The government is aiming to replace 95% of its copper network with fiber by the end of 2020, Deputy Spokesperson for Ministry of Communications & Information Technology (MCIT), Ahmed Zidane said. According to the official, 60% of state-owned operator Telecom Egypt's (TE's) copper network has been replaced with fiber so far, but the government is planning to accelerate the rate of replacement with a view to improving broadband penetration. Aiding the network modernization program, the government will utilize the fiber-optic manufacturing plant established in Badr in March 2018, Mr. Zidane added. (January 2, 2019) Agence Ecofin

# Jordan

The workshop on 5G (Fifth Generation) of Mobile Communications was organized by the Telecommunications Regulatory Authority ( TRA ) in cooperation with the Euro-Mediterranean Group of Regulators ( EMERG ), which was launched with the participation of representatives of the group of Morocco, Palestine, Tunisia, Egypt, Italy, France and Germany, Britain, Bosnia and Herzegovina, and Jordan. The workshop, which lasted for two days, is part of EMERG's plan of action to exchange views among member countries and to study the organizational, technical and economic issues of the fifth generation of mobile networks (5G). The study of the regulatory, technical and economic issues of the fifth

generation (5G) of mobile communications, in addition to the presentation of the level of application and adoption of the fifth generation in different member countries. It is worth mentioning that Jordan is a founding member of EMERG, which was established in 2008 and includes telecommunications regulators in the north and south of the Mediterranean. Jordan has already led its activities in 2014. Through its various activities, the Group seeks to harmonize and harmonize regulatory policies in the sector Communications to EU countries with those of other countries in the southern Mediterranean. (January 15, 2019) trc.gov.jo

# Kuwait

Kuwait is launching an initiative to create a $200 million fund for investments in technology, its Fforeign Minister said at an Arab Economic Summit in Beirut. Sheikh Sabah al Khalid al Sabah said

Kuwait would give $50 million to the fund to allow "investment in the fields of technology and digital economy" which the private sector will take part in. (January 21, 2019) business-standard.com

# Morocco

The telecom regulator ANRT said that its project to improve number portability should bear fruit from the end of 2019, when the process will become entirely automated. A new central database is currently being implemented and the country's three main network operators are collaborating with an administrator (Sirgad-Mediafon-Mediafon Data Pro), appointed last year as part of the project. Benefiting both fixed and mobile customers, the

automation will help reduce the time required to port numbers. The project was instigated by a decision issued by the ANRT in October 2015. According to the regulator's most recent annual report, the country saw the number of successful requests for mobile number portability increase to nearly 383,000 in 2017, from around 287,850 in 2016. (January 20, 2019) telecompaper.com

# Nepal

Nursing Association of Nepal is planning to unveil a mobile apps 'ICT Toolkit' to collect data and provide nursing services during the time of disasters. The Association has also conducted the mock test of the apps besides training the personnel for its easy accessibility. The mobile application is considered vital to collect data and reduce the health related risks in the time of disasters. Association's Vice-Chairwoman Apsara Pandey said that the toolkit would be supportive to provide nursing services and health care services during the time of disasters based on the available data. It is said that the more than 200 people would be trained about the mobile application in 14 highly affected districts from the Gorkha Earthquake. Recently, an international agency has awarded the Association with 'Risk Award 2017' for providing effective services to the quake-affected people in the time of Gorkha Earthquake. Pandey shared that a total of Rs 13.2 million received in prize would be spent for disaster management and capacity building of the nursing service.
(January 20, 2019) setopati.net

# Oman

Oman's Telecommunications Regulatory Authority (TRA) renewed the country's largest operator Omantel's mobile telecom license for a period of 15 years - commencing from February 2019. A one-time license renewal fees of 75 million Omani rials (Dh715m) will be charged by the TRA and the amount will be paid in two equal instalments by the telecom company in 2019 and 2020, said Omantel. "The renewal includes the spectrum that are currently allocated to Omantel under the existing first-class mobile telecom license and will not include the 5G spectrum," the company said. However, industry experts say that the payment of fees, in the set time-frame, could put pressure on Omantel financially. "Although the license extension fees on Omantel was expected for quite some time, this can pressurize the telcom operator's dividend paying capacity for the next two years, given that the charges need to be paid in two equal instalments," Nishit Lakhotia, Head of Research at Bahraini investment bank Sico, told The National. Omantel's revenues during the first nine months of 2018 increased to 1.5 billion rials, compared to 406.7m rials during the same period in 2017. The telco's 2018 revenues also included revenues from Kuwait's Zain Group, in which it owns a controlling share of 21.9 per cent. Anticipating local market saturation, dipping subscribers and imminent entry of the third mobile operator in Oman, Omantel had bought a stake in Kuwait's telecom operator Zain for more than $2.1bn in 2017. It is the company's second-largest shareholder after the country's sovereign wealth fund, the Kuwait Investment Authority. Omantel's customer base, exclusive of resale companies affiliated to the telco, declined by nearly 3.3 per cent to 3.4 million subscribers by the end of September 2018, compared to 3.5 million subscribers in September 2017. However, in a bid to create a competitive atmosphere and to offer superior services at competitive prices, the TRA is expected to announce the third mobile operator in Oman in the coming days. Yousef Balushi, Deputy Chief Executive for Spectrum Management Affairs at TRA, said the third operator in Oman will be announced early this year. He said all domains and frequencies for the third operator will be granted the same way as to Omantel and Ooredoo. Ooredoo, which launched as Oman's second mobile operator in 2004, broke the monopoly of Omantel, which is still majority owned by the government. Omantel is also pursuing its cloud computing and data center ambitions in the region. Last year, it announced a joint venture with the US tech company Equinix to develop a data center in Muscat, where carriers, content and cloud providers can house their IT infrastructure. Under the agreement, Omantel and Equinix are the two equal shareholders and the first of three phases is expected to start operations by the second quarter of 2019. (January 13, 2019) thenational.ae

The Telecommunications Regulatory Authority (TRA) conducted a drawing of lots for the allocation of the frequency band 3400 - 3700 MHz to the licensed mobile operators in Oman to be used in the operation of 5G networks where each operator was be allotted 100 MHz. The event, which was attended by a number of officials and specialists in the telecom sector, started with a speech by Engineer Yousuf bin Abdullah Al Balushi Vice President for Frequency Management Affairs. In his speech, Al Balushi revealed how the allocation of 5G bands is planned, stating that TRA will allocate the frequency band 3400 - 3700 MHz after coordination with the Ministry of Finance and said that TRA is closely following the current studies on the frequency bands that are tipped for the International Mobile Telecommunications service (IMT) within the WRC-19 agenda as TRA supports the inclusion of a definition for the IMT service in the frequency band 25, 24-5 and 27 GHz as well as the frequency band 40,5 - 43,5 MHz. Mr. Al Balushi clarified that the 5G technology will contribute substantially in facilitating the transfer of data at high speeds with minimum response time. It will provide adequate capacity for billions of internet-connected devices and will enhance customer experience and innovations to promote projects of safe and smart cities and the internet of things. There is a global emphasis on 5G technology and TRA is paying great attention to it and constantly follows studies and experiments conducted worldwide in this regard. Engineer Al Balushi further added that due to the regional and international trend to expedite the introduction of 5G services of IMT systems, TRA established a national team for IMT 5G comprising of TRA,

Ministry of Transport and Communications, Ministry of Regional Municipalities, Ministry of Environment and Climate Affairs, Ministry of housing, Muscat Municipality, Dhofar Municipality and Sohar Municipality beside the mobile operators in Oman to create a roadmap to introduce 5G services in the Sultanate before the year 2020, in addition to the preparation of comprehensive plans for all relevant issues. The national team continues its efforts with the parties concerned to ensure fruitful cooperation towards the successful launch of 5G technologies in Oman at the earliest possible time. Al Balushi went on to say that, the design of 5G networks requires the erection of hundreds of telecom towers and using the infrastructure of lighting poles, advertisement boards and any suitable existing and future structures to provide full coverage and high capacities to connect various devices, services and applications with the main telecommunications networks. He pointed out that TRA coordinated with the authorities in charge of issuing licenses for the installation of telecom towers and antennas to get ready for the introduction of this new technology and seek solutions to streamline procedures and overcome obstacles in this respect. As part of announcing the frequency bands that will be used for 5G, Mr. Yousuf Al Balushi said: "This announcement will allow the mobile licensees in Oman to undergo further experiments on 5G networks and prepare for the commercial introduction of this technology in the Sultanate by speeding up the preparation of 5G networks. The frequency band 3,5 MHz is one of the major frequency bands upon which the primary operation of 5G will rely given the great support accorded to this band by most world administrations and manufacturers". Afterwards, lots were drawn to allocate the three parts of the frequency band 3400 - 3700 MHz to the operators where TRA was keen to follow a fair and transparent standard. The draw was conducted in two stages; where the first drawing company was selected from the two companies, Omantel and Ooredoo. In the second stage the company chosen in the first stage drew the lots for one of the three parts of the frequency band 3400 - 3700 MHz which was as follows: Part one: 3400 - 3500 MHz, Part two: 3500 - 3600 MHz and Part three: 3600 - 3700 MHz. The second company then selected one of the two remaining parts of the band, while the third remaining part of the band (3600 - 3700 MHz) will be allocated in the future for the third operator in accordance with the applicable rules and regulations of TRA. The results of the lots were that Omantel will use the first part 3400 - 3500 MHz, while Ooredoo will use the second part 3500 - 3600 MHz.

(January 2, 2019) tra.org.bh

The license for the third mobile communications operator (from the local partners) is in the final stage and the announcement will be made early in 2019, Eng. Yousef bin Abdullah Al Balushi, Deputy CEO for Spectrum Management Affairs at the Telecommunication Regulatory Authority (TRA), said. The announcement was made during the draw, which was organized by TRA for the frequency domain 3400-3700 megahertz. The frequency will be distributed among mobile operators in the Sultanate to be used in operating 5G, 100 megahertz for each company. As per the outcome of the draw, Omantel was allocated the frequency from 3400 to 3500, Ooredoo from 3500 to 3600 and the third operator from 3600 to 3700, as per TRA rules and regulations. He pointed out in a statement to Oman News Agency (ONA) that all the domains and frequencies for the third operator will be ready and granted the same way with Omantel and Ooredoo. The aim of this process is to create a competitive atmosphere to provide better services at reasonable rates for all parties. He added that TRA will allocate the frequency domain 3400-3700 megahertz after coordination with the Ministry of Finance. He pointed out that TRA closely monitors the nominated frequency domains for international mobile communication services as per the items of the international radio communication conference. TRA supports adding a definition for international mobile communication services at the frequency domain 24.25 - 27.5 gigahertz and the frequency domain 40.5 - 43.5 gigahertz. He said that the 5G will ensure the transfer of data at a super speed and will reduce the response time. It will also provide enough capacity for the huge number of devices connected to the internet. It will also enhance customer experiences and will promote new initiatives such as smart cities and the Internet of things. He affirmed that TRA is deeply interested in the 5G technology and closely follows the studies and experiences in different parts of the world. "TRA has set up a national team for 5G mobile communication. The team comprises members from the Ministry of Transport and Communications, the Ministry of Housing, the Ministry of Regional Municipalities, the Ministry of Environment and Climate Affairs, Muscat Municipality, Dhofar Municipality and Sohar Municipality, in addition to mobile service operators in the Sultanate," he said. "The team seeks to develop a road map to introduce 5G services in the Sultanate before 2020, in addition to preparing a comprehensive plan for the systems. The team is making great efforts to enhance joint cooperation among the different stakeholders to ensure the success of the 5G technologies in the Sultanate at the earliest," he added.

(December 29, 2018) timesofoman.com

# Pakistan

Pakistan Telecommunication Authority (PTA) has established a Cyber Vigilance Division (CVD) to handle complaints against unlawful online content under Prevention of Electronic Crimes Act (PECA). In order to handle this role, PTA has also developed Standard Operating Procedures (SOPs) for lodging complaints and their disposal has been developed accordingly. All content hosted on unsecured websites is being currently handled through telecom operators and PTA itself. On the contrary, any content

which is unlawful and hosted on secured web site is handled differently. Popular social media websites like Facebook, YouTube and Twitter are a few examples of secured websites which are hosted outside of the physical boundaries of Pakistan. As per PTA's latest report, the authority has developed close liaison with all such platforms to honor requests made for removal of content that does not pass the standards of CVD. It said historically and predominantly, PTA has been acting under functions and powers

given by Pakistan Telecom (Re-organization) Act, 1996. However, with development and growth of the internet, PTA has been entrusted upon with the responsibility of blocking or removing of any content which is declared unlawful under relevant provisions of the law. This responsibility was handed over to PTA under Prevention of Electronic Crimes Act (PECA), 2016. Since the promulgation of PECA, PTA stands committed to the responsibilities of the facilitation of aggrieved internet users and stakeholders, including government organizations, public offices, business entities and other agencies. Under Section 37 of the PECA, 2016 content which is "against the glory of Islam, against the integrity, security and defense of Pakistan, public order, contempt of court, against decency & morality and incitement of any offices" will be blocked or removed. The complaints received by the PTA against unlawful online resources including anti-state, anti-judiciary content, blasphemy. In this regard, the PTA has already blocked 824,878 URLs so far. All of these came under its jurisdiction through PECA. (January 20, 2019) dawn.com

As per directives issued by Federal Government regarding extension in timeline for registration of mobile devices under Pakistan Telecommunication Authority's Device Identification Registration & Blocking System (DIRBS), all mobile devices which are already activated on cellular mobile networks within Pakistan by 15th January, 2019 shall remain operational without service disruption. Even non-compliant devices in operation prior to this date will be tied to these numbers and will remain operational till the useful life of the device. PTA developed/established Device Identification Registration & Blocking System (DIRBS), in line with Telecom policy 2015, issued by Ministry of Information Technology & Telecom, section 9.6 with the aim to curtail the counterfeit mobile phone usage, discourage mobile phones theft and protect consumer interest. All Pakistani mobile device users wishing to know status of a device can send each 15 digit IMEI number via SMS to 8484. The status of the mobile device can also be checked via PTA website link www.dirbs.pta.gov.pk or by downloading DIRBS android mobile application. For further details: visit PTA website. (January 13, 2019) dailytimes.com.pk

Ufone, is the fastest operator in terms of call connectivity in Pakistan. A recent Pakistan Telecommunication Authority (PTA) survey found Ufone takes 5.73 seconds to connect a call, fastest among all networks in the country. It is followed by Zong with 5.99 seconds and Telenor Pakistan with 6.32 seconds. In the year 2018, PTA has conducted quarterly Quality of Service (QoS) survey jointly with Cellular Mobile Operators (CMOs) using NEMO automated QoS tool. During the period, a total of twenty-seven (27) cities of Pakistan including AJK, have been surveyed. Jazz, Pakistan's biggest operator, proved to be the slowest one among all operators to connect a caller with the receiver of the call, according to Pakistan Telecommunication Authority (PTA). Zong is the fastest 3G operator among all four mobile phone companies operating in the country whereas Jazz is the fastest 4G operators providing mobile broadband internet service to their customers. There are 60 million broadband internet users in Pakistan using 3G and 4G technologies. Except for Ufone, three operators—Jazz, Zong, and Telenor provide broadband service through 3G and 4G technologies alike. Jazz is the market leader with 20 million internet

users. It is followed by Zong with 17 million and Telenor with 13 million users. Ufone is the only 3G operators with subscribers' base of 8 million by the end of November 2018, according to PTA's data. PTA survey also evaluated the performance of cellular operators in terms of network availability, call complete ratio, signal strength, network downtime, and etc. The survey can be viewed in detailed here. (January 4, 2019) thenewstribe.com

The Pakistan Telecommunication Authority (PTA) has unveiled its plans for the Fifth Generation (5G) Wireless Networks public trials, demonstrate systems and/or services in Pakistan. In this connection, the regulator has issued draft framework for test and development of future technologies particularly for 5G wireless networks in Pakistan 2018. According to the PTA, the rapid growth in mobile data traffic and consumer demand for enhanced mobile broadband experience have led to an increasing emphasis on the upcoming fifth generation of mobile technology (5G). "Seen as a comprehensive wireless-access solution with the capacity to address the demands and requirements of mobile communication beyond IMT-2020, it is projected that this technology will operate in a highly heterogeneous environment and provide ubiquitous connectivity for a wide range of devices, new applications and use cases". IMT-2020 is a term developed by the International Telecommunication Union (ITU)'s Radio communication Sector in 2012 to develop the vision of "IMT for 2020 and beyond." The ITU has set a timeline that calls for the standard to be finished in 2020. Pakistani telecom regulator said the scope of IMT-2020 is much broader than previous generations of mobile broadband communication systems. The ITU's work in developing the specifications for IMT-2020 in close collaboration with the whole gamut of 5G stakeholders is now well underway along with the associated spectrum management and spectrum identification aspects. IMT-2020 will be a cornerstone for all of the activities related to attaining the goals in the 2030 Agenda for Sustainable Development. The draft framework for 5G enables the use of radio spectrum on trial basis for noncommercial purposes to carry out trials for innovative use of radio frequency spectrum, apparatus/equipment and academic purposes including but not limited to scientific research, radio concepts and new systems demonstrations, added PTA. The PTA said Government of Pakistan (GoP) policy directive based framework invites all stakeholders for participation in subject trials. The framework has been issued only for temporary Test and Development licenses/authorizations which shall include criteria for the provision of authorization, conditions, duration, and other terms and conditions. The Frequency Allocation Board (FAB) shall assign the spectrum to be used for subject trials which shall become effective from the date of Authorization issued by PTA. It is important to mention here that the PTA said mere assignment of spectrum by FAB would not give right to the applicant for use of the same until Authorization is obtained from PTA. The Test & Development Authorization allows an applicant to use spectrum on non-exclusive, non-commercial basis temporarily for the testing purposes. There is no regulatory fee associated with subject non-commercial trial permission or the spectrum usage for said purpose. Also, users/consumers will not be charged for any services offered during the trial. The trial shall last for the period of three (03) to Six (06) months or as stated in the Authorization issued by PTA Spectrum for the

trial will be available only at the designated test sites subject to localized restrictions (if any) due to National security issues.

(December 29, 2018) dailytimes.com.pk

Pakistan Telecommunication Authority (PTA) has proposed the establishment of telecom tribunal for speedy disposal of litigation related to the sector. "Telecom Tribunal, proposed under section 7 of Pakistan Telecommunication (Reorganization) Act 1996, may be established by government for speedy disposal of conflicts in the best interest of sector. Giving details, the Authority, in its latest report-2018 has said while making regulatory decisions, PTA ensures that due procedure is followed as prescribed in legal framework available for passing a decision. Starting from

consultation with stakeholders to issuing of show-cause notices till right to appeal, PTA tries to be as considerate and cooperative as possible so that friction can be avoided. However, the report said, a large number of PTA's decisions, determinations, orders and even regulations are challenged by licensees in courts of law. Despite the fact PTA pursues cases through its legal counsel and consultants, telecom cases still get delayed for justice due to heavy influx of other cases. It said since nature of telecom cases are mostly time bound, due to rapid advancements in modern technology and associated business model relevance, therefore, most of times the delay in passing of decisions renders them ineffective.

(December 24, 2018) nation.com.pk

# Saudi Arabia

The Communications and Information Technology Commission (CITC) has awarded new frequencies for 4G/5G use to Saudi Telecom Company (STC), Etihad Etisalat (Mobily) and Zain Saudi Arabia. The regulator disclosed that it granted a total of 290MHz in the two bands, bringing the total spectrum allocated in the Kingdom to 710MHz. STC confirmed the allocation by announcing that it had secured spectrum in the 2300MHz band, for use from January 2020. The operator paid SAR360 million (USD96 million) for the 15-year spectrum concession, to be payable in equal instalments starting 1 January 2020, adding that the 'investment will be internally-financed from the company, and is not expected to have a material impact on the company's financial results'. The new frequencies will increase the capacity of STC's mobile network to meet growing demand for services, while also enhancing the speed and quality of its mobile data services, the operator added. (January 24, 2019) telegeography.com

The Communications and Information Technology Commission (CITC) has approved a decision to expand the scope of the unified licenses awarded to STC, Etihad Etisalat (Mobily) and Zain Saudi in 2016. The regulator said in a statement: 'The decision will enable the three mobile operators to offer all services under a single license, including mobile and fixed line services, IoT, artificial intelligence and digital application services.' (January 2, 2019) telegeography.com

The second Internet of Things (IoT) exhibition will begin in Riyadh on February 13, 2019, under the patronage of the Ministry of Communication and Information Technology. The two-day event will host a number of international, regional and local players in advanced technologies, connectivity, broadband and digital transformation. Latest technologies, digital solutions and applications of IoT will be on display at the event. Experts see great potential in the Kingdom's capacity to adopt and embrace IoT due to the growth of and investment in smart cities as part of the Kingdom's Vision 2030. "IoT is the natural evolution of the internet, where all tools needed by an individual are connected to the internet and the system has become more general and comprehensive ranging from household appliances, cars, buildings and aircraft up to modern apps, covering all fields," said Fahd Al-Garni, general manager of New Horizon for Conferences and Exhibitions. The exhibition will highlight the latest emerging technologies such as massive data and artificial intelligence. "Cloud-based computing is the main key feature of IoT through which the exchange of large data can be achieved with less time and cost," Al-Garni said. The event will bring together more than 50 speakers and experts like academics, researchers, and heads of national and international companies. Participants will display their achievements in technical solutions and their efforts to implement Digital Transformation Program 2020. The event will provide international participants a platform to share their knowledge and experience in advanced technologies.

(December 25, 2018) arabnews.com

# Sudan

Sudanese authorities are blocking access to popular social media platforms used to organize and broadcast nationwide anti-government protests triggered by the economic crisis, Reuters reported, citing internet users. Authorities have not repeated the internet blackout they imposed during protests in 2013 but

the head of the National Intelligence and Security Service, Salah Abdallah, said the government had discussed blocking social media sites and in the end decided to go ahead.

(January 4, 2019) telecompaper.com

# Tunisia

The value-added tax (VAT) applied to fixed Internet services in homes is reduced from 19% to 7%, as stipulated in the Finance Act 2019, which came into force after its publication in the Official Gazette of the Republic of Tunisia. This measure will allow the systematic reduction of broadband Internet subscription fees and will encourage an increase in the number of Internet subscribers. It also aims at ensuring social inclusion, narrowing the digital divide between regions and facilitating consumer access to the Internet. (January 5, 2019) africanmanager.com

Anouar Maarouf Tunisia's Minister of ICT and Digital Economy, has announced that 5G licenses will be available in Tunisia by 2021. He was speaking in Tunis during the launch of the 2nd workshop on 5G organized by the National Spectrum Agency – Agence nationale des fréquences-ANF. Commenting on the initiative, Anouar Maarouf added: "We should prepare ourselves for this new phase. There is favorable ground for innovation and investments in Tunisia, notably after the enactment of the law on startups, especially as they need efficient and modern networks to develop their innovative solutions." Telecom operators in the country are already testing their technical capacities to support 5G. Tunisie Télécom in collaboration with Huawei, tested 5G in May 2018 in Tunis. The public company reportedly reached a download speed of 638.66 Mbps live with a widely used consumer smartphone.
(December 30, 2018) broadcastprome.com

# Turkey

The 61st PT1 meeting of the Electronic Communication Committee (ECC) is being hosted by BTK. Ömer Abdullah Karagözoğlu, the President of Information Technologies and Communication Authority, participated in the meeting as well as many local and foreign sector representatives. Speaking at the opening of the program Karagözoğlu, 5G gave information about the work. As we all know, research and studies for 5G and beyond technologies that are in the process of determining the international standards planned to be established in the 2020s are continuing rapidly all around the world. It is vital to ensure that 5G bands are accurately identified in the near future. Expressing that the work of the ECC PT1, which defines what mobile industry can do, is of great importance, Karagözoğlu said, band the group responsible for mobile broadband communication services within the CEPT is ECC Project Team 1 (ECC PT1) which is one of the sub groups of the Electronic Communication Committee (ECC). The ECC PT1 team is responsible for identifying technical criteria for mobile broadband communication services (LTE, 5G), developing band plans, conducting electromagnetic compatibility studies, and developing and reviewing ECC decisions and recommendations. In addition, the European Common Opinion for the WRC agenda items on mobile broadband is being established within PT1. The ECC PT1 and the CEPT perform a major task to achieve this. Karagözoğlu said that he believed that the sessions, the participant spectrum managers and the industry partners would offer fruitful platforms for the exchange of views, and he wished the meeting to be fruitful.
(January 14, 2019) btk.gov.tr

# United Arab Emirates

The official portal of the UAE Government witnessed significant increase in its users, touching 5 million in 2018. Compared to the number of users in 2017, the figure tripled in just one year. The number of sessions for 2018 reached 7.5 million, while page-views amounted to more than 12 million. For top visited pages, 'visa tracking and fees' came in the first place, followed by 'value added tax' and then 'employment laws and regulations'. In recent months, the portal's ranking on the search engines jumped to the top in search results for many of the keywords used by people in their search for information and services provided by the UAE government. Statistics show that 83 per cent of users visit the portal through organic search and 37 per cent of users come to the portal from countries outside the UAE which include India, Saudi Arabia, the UK, the USA and Egypt. The terms the portal users searched for on the portal's search engine focused on visas, jobs and taxes. Different phrases were used to search, but most of them related to visas, jobs and taxes. H. E. Hamad Obaid Al Mansoori, Director General, TRA comments, "Government.ae is the official portal of the UAE Government and is the main interface of the UAE on the Internet. It supports the Whole-of-Government principle, as emphasized by H. H. Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai when he had launched the portal in 2011. The increase in the portal users contributes to the

achievement of the TRA's goals, particularly the enhancement of electronic lifestyle in the UAE.  It also helps increase in usage of online services to keep up with the Leadership's instructions." For his part, H. E. Salem Al Housani, Acting Deputy Director General, Information and Smart Government Sector, says, "We aim to make the UAE's national portal as the first destination for people to search for government services and information. These people could be citizens, residents, visitors or those living abroad and having the desire to know about the UAE. Therefore, the portal management team updates the portal's content daily, taking into account the suggestions and feedback of the portal users." It is noteworthy that the TRA launched the revamped portal in April 2017, after implementing major updates that reflect the global developments and local needs. The portal management team conducted many user experience tests to monitor the needs of different groups of society and incorporated the results into the business requirements in the areas such as content, design and accessibility of information and services, focusing on the people of determination in particular. In May 2018, the TRA launched a campaign aiming at the development of the content of the official portal of the UAE Government (Government.ae). The mechanism of the campaign involves the target groups suggesting information that is missing on the portal and providing official references and sources of such information. The campaign achieved considerable success which resulted in adding and updating more than 100 topics. Based on this success, it was decided to continue the campaign during 2019. The campaign will be one of the several channels of communication between the users and portal management and to follow up on the interests and needs of the government's customers. The portal Government.ae consists of four main sections; they are information and services, about the UAE, eParticipation and media. The information and services section addresses many topics such as employment, investment, tourism, infrastructure and visa, as well as a complete list of all government services in the UAE. The second section covers the history of the UAE in various eras, in addition to plans and strategies of shaping the UAE's future and achieving a comprehensive development. This section also covers the UAE's efforts to achieve the Sustainable Development Goals 2030 set by the United Nations. In the eParticipation section, numerous channels of communication with the UAE government are available, including consultation and instant chat platforms etc. (January 5, 2019) tra.gov.ae

## REGULATORY ACTIVITIES BEYOND THE SAMENA REGION

### Argentina

The National Communications Agency (Ente Nacional de Comunicaciones, ENACOM) has confirmed plans to repurpose cellular frequencies previously reserved for state-owned telecoms firm ARSAT, as it seeks to 'generate competitive conditions and promote regional development'. The decision, which was included in the 'Boletin Oficial' as Decree 58/2019 (Ley de Desarrollo de la Industria Satelital, Satellite Industry Development Act), will see the watchdog reassign ARSAT sufficient frequencies 'for the fulfilment of its purposes', while supporting the needs of smaller players – most likely the country's numerous regional telecoms cooperatives. As such, regional and local operators stand to gain access to no less than 20% of the frequencies currently held by ARSAT, namely: 738MHz-748MHz/793MHz-803MHz (nationwide); 1745MHz-1770MHz/2145MHz-2170MHz (nationwide); 1895MHz-1905MHz/1975MHz-1985MHz (Region I – North); 1890MHz-1900MHz/1970MHz-1980MHz (Region II – Buenos Aires Metropolitan Area); and 1880MHz-1890MHz/1960MHz-1970MHz (Region III-South). (January 22, 2019) telegeography.com

The communications regulator and the state secretary for modernization announced with the three mobile operators Claro, Movistar and Personal the 'Connected Summer' plan, aimed at bringing improved mobile coverage along the Atlantic coast for the summer season. In Mar del Plata, they announced that 80 new base stations have been installed, adding to the 1,000 already providing 4G coverage in the main resorts. The improved coverage is expected to support growing demand for internet services and tourism in the local economy. Additional 4G base stations were added around Mar del Plata as well as the coastal areas San Clemente del Tuyu, Santa Teresita, San Bernardo, Mar de Ajo, Villa Party Gesell and Partido de Pinamar. The expansion is part of the coverage requirements in 4G licenses. In the past two years, the number of 4G base stations deployed across the country increased more than 150 percent, going from 7,600 to over 20,000, for coverage of 58 percent. The National Communications Plan targets coverage of 93 percent of the population by the end of this year, including deployment in 1,713 cities of more than 10,000 inhabitants, 9,961 km of roads and 200 small localities that do yet have quality mobile internet. The expansion has helped reduce the call drop rate by 50 percent in the past year, Enacom said. At the same, mobile data traffic rose 250 percent year-on-year on 31 December. (January 5, 2019) telecompaper.com

### Australia

The Australian Competition and Consumer Commission is urging customers of the National Broadband Network's major retail service providers to check if they are entitled to a refund if they have been sold speed plans their infrastructure is incapable of providing. The regulator has now accepted undertakings from Telstra, Optus, TPG, iiNet, Internode, Dodo, iPrimus and Commander to refund more than 142,000 NBN customers who had been sold plans with maximum theoretical speeds that they could never experience due to the limitations of FTTN and FTTB technologies. The operators all agreed to contact the consumers and offer them a range of options, including moving to a lower speed plan or exiting their contract penalty free and receiving a refund. But according to the regulator, two in three affected customers have not responded to the letter or email from their provider, and may be entitled to refunds that could reach hundreds of Australian dollars. As part of newly introduced regulations, NBN retail service providers are also required to check the speeds of all customers signing up to a new plan within four weeks of activation. If speeds are below advertised, they must offer customers similar remedy options including refunds. "Our message to RSPs is that if you advertise a particular connection speed and customers cannot experience that speed, you risk breaching the Australian Consumer Law," ACCC acting chair Mick Keogh said. "We expect RSPs to provide consumers with accurate information up front about the internet speeds they can expect to experience, and then deliver on those promises." (January 23, 2019) telecomasia.net

A decision on the proposed merger between TPG Telecom and Vodafone Hutchison Australia (VHA) has been postponed by the Australian Competition and Consumer Commission (ACCC). In an update on its website, the regulator noted that – having initially set out its intention to issue a final decision regarding the deal on 28 March 2019 – it was pushing this date back 'due to a delay in receiving information from merger parties'. As such, the ACCC now expects to publish its final ruling on 11 April, although it has said it will confirm this timeframe 'when the information from the merger parties is received'. In December 2018 the ACCC said that, after taking an initial look at the proposed merger between TPG and VHA, it had preliminary competition

concerns over its potential impact on both the mobile and broadband markets. In summary, the ACCC at that date published a statement of issues which set out its concerns and specifically highlighted the possible

impact of the deal on TPG's activities in the mobile arena and Vodafone's efforts in the fixed broadband market.
(January 22, 2019) telegeography.com

## Belgium

BIPT periodically collects coverage maps from the three mobile operators involved for each of the three mobile technologies rolled-out at the moment (2G, 3G and 4G). These maps also show the average coverage attained in each community in Belgium. These coverage maps translate the presence of the network outdoor for a reference standard service but do not entirely reflect the actual quality of service, as experienced by the customer; this quality may be influenced by different factors, for instance the fact that the service is provided within a building or a vehicle, the type of terminal equipment used (conventional mobile telephone, smartphone, tablet), the type of service used (telephone service, data transmission), etc. Before BIPT publishes the information on the mobile networks' coverage on his website, it carries out monitoring campaigns in the field by means of a professional measuring device (RF scanner) to verify whether the coverage data provided by the mobile operators, are correct. The data is validated in a statistical form according to a method determined in cooperation between BIPT and the mobile operators. Each coverage map is represented with a percentage of reliability corresponding to the share of the pixels (an area of 200 m by 200 m) that have been declared by the operator as covered and that were validated during the monitoring campaign by BIPT. An area is validated when the signal level was higher than the minimum threshold demanded by BIPT for at least 95% of the measurements performed. Each time that BIPT verifies the mobile operators' coverage maps through measurements, it publishes a mobile network monitoring report. In Belgium mobile services are not only provided by the three mobile network operators (BASE, Orange (Ex-Mobistar) and Proximus) but also by a number of virtual mobile operators or MVNOs or by commercial partners. (January 24, 2019) alertify.eu

Belgian regulator BIPT has launched a number of pre-consultations on the resale of internet and television on fixed networks. The regulator is working on four

separate decisions. The first three pre-consultations are on the Brutele, Nethys and Telenet reference offer projects for Bitstream coax and the resale of television services. The fourth pre-consultation is for the Proximus reference bid project for Bitstream GPON, namely, fibre network under construction. BIPT said it imposed new reference offers on Brutele, Nethys, Telenet and Proximus after its analysis on 29 June of the broadband and television broadcasting markets. The market analysis made the four operators develop a reference offer. BIPT took the reference offer from 2011 as base for the pre-consultation, with a few updates. The regulator said it first wants to assess the reactions of the market and then decide if larger adjustments are needed. A new decision will be offered later in a real consultations. The pre-consultations will run form 22 January to 19 February. (January 23, 2019) telecompaper.com

Belgium's planned 5G auction will no longer take place this year, Telecom Minister Philippe De Backer told De Tijd last week. The Belgian government had previously said last year that a 5G auction would take place in 2019, however, De Backer stated that it will not happen until 2020 at the earliest. The delay is down to the Regional Government Consultative Committee not being able to agree on how the money raised from the prospective 5G auction should be distributed, with a total of EUR680 million (USD772.6 million) expected. The Consultative Committee has planned a consultation to take place next month, in which it is hoped that all parties concerned will come to an agreement regarding the 5G auction before Belgium's federal elections take place in May. Despite the uncertainty of when the 5G auction will take place, Belgium's mobile operators Orange, Proximus and Telenet have made no changes to their initial 5G launch plans, with Orange aiming to commercially roll out 5G in Brussels in 2020, with Proximus and Telenet aiming to deploy commercial 5G a year later in 2021.
(January 21, 2019) telegeography.com

## Bosnia and Herzegovina

The Council of Competition (Konkurencijsko vijece) has approved the acquisition of cable operator Blicnet by Telekom Slovenije, local news outlet Oslobodenje reports. As previously reported by CommsUpdate, in October 2018 it was revealed that Telekom Slovenije was to acquire Blicnet for an undisclosed fee via its Bosnian subsidiary Telekom Srpske, which trades under the m:tel banner. With the competition watchdog having subsequently invited comments from interested

parties on the deal in the wake of its announcement, it is understood another of Bosnia's cableco – Telemach – had objected to the proposed acquisition. However, having considered the matter with regards to the possible impact on competition in the fixed and mobile voice, broadband and Pay-TV sectors, the Council of Competition has determined that the deal can move forward.
(January 8, 2019) telegeography.com

## Brazil

Telecoms regulator Anatel is prioritizing spectrum assignations in its agenda for the years 2019 and 2020. Highlights are the implementation of 5G and the auction of the 3.5 GHz band, as well as of the frequency bands 1427-1518 MHz, 2300-2400 MHz, 4800-4990 MHz and the leftovers in the 700 MHz and 2.5 GHz bands.

The plan is to begin deploying 5G on the 3.5 GHz band, which Anatel president Leonardo de Morais expects at the end of 2019 or early 2020. Also on the agenda is a reduction of regulatory barriers for the expansion of IoT and M2M.

(December 31, 2018) telecompaper.com

## Burkina Faso

Orange Burkina Faso, the West African nation's largest mobile operator by subscribers, has been awarded a 4G license by the Ministry of the Development of Digital Economy and Posts (Ministre du Developpement de l'Economie Numerique et des Postes, MDENP). The cellco paid XOF40 billion (USD69.5 million) for the 15-year concession and committed to pay a further XOF40 billion to renew its existing 2G/3G licenses.

The remaining fee will be paid in two instalments, as specified by the regulator. The license handover took place on 15 January, and Orange Burkina Faso CEO Ben Cheik Haidara told reporters that subscribers can expect a commercial launch 'very soon', with speeds of up to 150Mbps expected to be made available to users with LTE-compatible handsets.

(January 18, 2019) telegeography.com

## Chile

The Department of Telecommunications (Subsecretaria de Telecomunicaciones, Subtel) has extended to 13 March 2019 the deadline for the registration of equipment that connects to mobile networks – including cell phones, tablets and IoT connected devices – under the Multiband/Emergency Alert System (Sistema de Alerta de Emergencia, SAE) regulations. Under the legislation, all equipment sold in Chile must be registered by the sellers, and equipment brought into the country by individuals must be registered with one of 15 certification companies approved by Subtel to do so. Each customer has the right to register a new device this way for free once per year. In its press release, Subtel informed customers that they will receive a reminder on 11 February, following which they have 30 days to register, or their

device will be blocked. Subtel noted that tourists roaming on a Chilean network would be unaffected by the requirement to register. Should visitors choose to replace their SIM with one from a local provider during their stay, however, they will need to register the device or risk it being blocked. The registration process is primarily targeting equipment purchased overseas and looks to tackle two issues. Firstly, it aims to ensure that all devices in use by citizens incorporate technology that allows the subscriber to receive messages from Chile's SAE and thus minimize risk to those individuals in the case of an emergency. Secondly, the measures form part of the regulator's efforts to protect competition by providing clarity for customers on their device's technological compatibility.

(January 9, 2019) telegeography.com

## Croatia

The telecom regulator Hakom has blocked the sale of pay-TV DTT platform Evo TV by Hrvatski Telekom (HT) from the Croatian Post. The deal was announced at the end of November by HT chairman Davor Tomaaskovic, who immediately resigned. (January 13, 2019) HRT

## European Union

National authorities in Europe need to get serious on allocating 5G frequencies, the head of the group managing the European Commission's digital agenda warned. Roberto Viola, who leads the Directorate General for Communications Networks, Content and Technology (pictured) said several member states needed to move faster, following the publication of legal obligations by the EU in December 2018. He noted some countries were at still at the stage of public consultations, while others were experiencing legal issues with the spectrum allocation progress. "I urge

everybody to be serious about the legal obligations to make the frequencies available," he said. "What is worrying is the delay in some member states that are usually very good in digital deployment. In some member states there is not even a date. In some there is a consultation, we need much more." He added the next few months were crucial if the EU was going to meet its various 5G targets, but believes there is "no need to use the whip" because the rewards speak for themselves. Voila also noted the majority of countries were "ready to go" on the allocation of 5G-suitable

frequencies by 2020. While industry figures have lately attempted to dampen the rhetoric on 5G, Viola said he believed the technology was worth the hype as it was "the glue" which held together artificial intelligence, blockchain and high performance cloud computing. He noted it was not important to be the first region to

launch 5G, but said the EU was in a good position to lead in some segments of the ecosystem, specifically connected transportation systems. Viola said two of the aims of his department was to eventually make the EU accident free and pollution free using connected vehicle technology. (January 23, 2019) mobileworldlive.com

## India

The Telecom Regulatory Authority of India gave time till January 31 for consumers to select channels of their choice under the new framework for broadcasting and cable services and said all existing packs of subscribers will continue uninterrupted till then. The TRAI, in March, 2017, had notified the new regulatory framework for Broadcasting and Cable services and re-notified it on July 3, 2018, prescribing the implementation schedule. According to the implementation schedule, all the service providers were required to complete the preparation for migration to new framework by December 28, 2018, as the new framework will come into force the next day. In order to facilitate all service providers to migrate their subscribers from old to new framework without causing inconvenience, TRAI, after consultations with broadcasters, DTH operators, and MSOs (multi-system operators), has given them more time to seek options from subscribers for smooth and interruption-free migrations. "All existing packs/plans/bouquets to the subscribers will continue uninterrupted till January 31, 2019. No service provider to disconnect any signal or feed to any MSO/LCO (local cable operator)/ subscriber till January 2019," TRAI said in a statement. Distribution platform operators (DPOs) will devise their own mechanism to reach out to all the subscribers and seek options from subscribers, it said. DPOs need to migrate all the subscribers to new framework with effect from February 1, 2019, it said. In order to have a smooth implementation of the new regulatory framework that will come into effect Saturday, TRAI held a series of meetings and consultations with all the stakeholders including Consumers Advocacy Groups (CAG) during last 4-6 weeks, the statement said. It was noted during those discussions that to make the consumers aware about the new framework and the process of seeking fresh choice of TV channels from about 150 million subscribers would require some time and resources of the service providers. "Subsequently, the Authority (TRAI) also held meetings on December 19 and December 27 with various service providers of the broadcasting and cable services sector. The preparedness for migration of all subscribers from old to new framework was also assessed," TRAI said. The Telecom regulator said the issue of smooth migration from the old to new regulatory framework was specifically discussed and it emerged that, by and large, most stakeholders are ready for implementation of the new regulatory framework. TRAI said DPOs shall declare the Distributor Retail Price (DRP) and Network

Capacity Fee (NCF) by December 29. The government had said on Thursday that the new regulatory framework for broadcasting and cable services will provide "freedom of choice" and give consumers "direct control" on their monthly bill for television services. (December 31, 2018) firstpost.com

The telecom regulator is looking at ways to lower the base price at which bids will be sought for airwaves in future auctions, as it seeks to move away from its usual practice of mechanically hiking the starting price in every successive sale. It will soon start a consultation process to arrive at a new methodology which may take into account the health of carriers, possibly addressing a long-standing demand of the industry reeling under high debt. This exercise will, however, have no impact on the next spectrum sale which is scheduled to take place in the second half of 2019, and for which the base price has already been announced. The last round of auctions took place in October 2016, and from next year, Telecom Regulatory Authority of India (TRAI) is keen to make them an annual feature. High base prices for spectrum at auctions, going back to 2010, have been a major contributory factor in the telcos running up debts of around Rs 7 lakh crore. Caught in a brutally competitive environment, even India's larger older operators have struggled to generate enough cash to service loans and pay their annual airwaves fees. These issues have resulted in a bulk of the airwaves put up for auction going unsold in recent times. "Certain service providers have raised concerns about the reserve price of spectrum in every subsequent auction being sat the discovered price of the last auction plus indexing. This means the price of spectrum keeps increasing, irrespective of whether the telecom industry can pay the price," a senior official at TRAI told ET. "When something is sold off for Rs 10, the circumstances could have been different. And the approach that now it should be at least worth Rs 15, is not correct. Also, among all methods, opting for the one yielding highest value is also not correct," the official said. A second official said it was time to change this "monotonically increasing function. The base prices should not keep increasing all the time... this (auction methodology) needs to be reviewed in the light of changing technology and state of the industry," a second official said. TRAI's methodology has historically resulted in the spectrum prices in India being among the highest in the world. For example,

price of the 600 MHz band sold in the US last year was around Rs 3,500 crore a unit, while the initial price of the 700 MHz band in India in 2016 was set at nearly Rs 11,500 a unit. No telco touched the band in the October 2016 sale. And more recently, TRAI's proposed base price of Rs 492 crore per unit of 3500 MHz 5G spectrum is much higher than Rs 65 crore per unit at a recent 5G auction in Korea, which may limit participation in this band as well in the next sale, said analysts. The official added that the new methodology should discover a price which has to be attractive enough for telcos to participate but not too low as well. "For this, we will need to keep the variables objective enough," the official said, but didn't elaborate.

(December 28, 2018) telecom.economictimes.indiatimes.com

## Indonesia

Indonesia's Ministry of Communications and Information Technology MCIT, (KemKominfo), has commenced spectrum refarming of the 800MHz and 900MHz bands. The process – which arises from the passing of Decree No. 998 of December 2018 (Concerning the Re-Arrangement of 800MHz and 900MHz Radio Frequency Bands for the Need for Organizing Cellular Mobile Networks), and SDPPI Decree No. 29 / DIRJEN / January 2019 (Concerning Technical Guidelines for the Rearrangement of 800MHz and 900MHz Radio Frequency Bands for the Need for Organizing Cellular Mobile Networks) – began on 23 January 2019, it said, and affects mobile network operators (MNOs) Telekomunikasi Selular (Telkomsel) and Indosat Ooredoo. Unlike KemKominfo's rearrangement of the 2.1GHz band which was concluded in April 2018 involving three MNOs, this time the re-tuning of the use of the lower bands only involves two cellular operators, it confirmed. In announcing the plan, KemKominfo head of public relations Ferdinandus Setu explained that the refarming exercise would begin in some Riau Islands clusters and will continue to completion for all Telkomsel and Indosat networks throughout Indonesia. In accordance with the data from the Directorate of Resources Planning, a department within the Directorate General of Resources and Equipment of Post and Information Technology, the entire exercise will involve no fewer than 42,000 network elements (i.e. base stations) operating at 800MHz and 900MHz, and is expected to be completed no later than 21 March 2019. As it stands, the radio frequency bands used by MNOs lack consistency and are still not contiguous – in particular the spectrum held by Telkomsel. The refarming and reallocation is intended to improve efficiency and better optimize the use of radio frequency bands, with the ultimate aim of achieving contiguous radio frequency bands for all Indonesian cellular operators to enable them to implement advanced mobile broadband services more easily. (January 25, 2019) telegeography.com

The Ministry of Communications and Information Technology (MCIT), (KemKominfo), has officially revoked the radio frequency band licenses (IPFR) owned by Indonesian operators First Media and Internux, trading under the banner Bolt!, for the non-payment of arrears on its Usage Rights Fees (BHP). Internux had held IPFR permits relating to broadband wireless access (BWA) spectrum it secured in a July 2009 auction of 2300MHz frequencies. The operator was issued with 15MHz bandwidth in Zone 4: Northern Sumatra, Jakarta, Bogor, Tangerang, Depok, and Bekasi (Jabodetabek) and Banten, and following a threat to rescind its licence in November 2018, the operator said it was committed to constructing and maintaining a BWA network in compliance with all regulations. The telco reportedly submitted a settlement proposal to the Ministry on 16 November, in the hope of achieving a solution, but that proved short-lived as KemKominfo officially revoked its licenses on 28 December under Ministerial Decree (KM) Numbers 1011 and 1012 of 2018. At the time of the decision, First Media and Internux (Bolt!) had BHP arrears of IDR364.84 billion (USD25.57 million). Meanwhile, the IPFR held by rival operator Jasnita Telekomindo is also thought to have been revoked. KemKominfo's decision to carry through its threat effectively brings to an end Bolt!'s foray into Indonesia's national broadband market. Having pioneered 4G TD-LTE wireless broadband services in Zone 4, the company (whose customer base peaked at around three million) announced on 17 September 2018 that it was struggling financially and declared the formal Postponement of Temporary Debt Payment Obligations (PKPUS) which required it to then submit a debt restructuring proposal based on the request of its creditors, PT Equasel Selaras and PT Intiusaha Solusindo. Although the proposal was endorsed in the commercial courts, the Ministry of Finance (Kemenkeu) rejected the repayment plan presented and the permit was subsequently revoked – prompting broader calls for a restructuring of fees and license terms and conditions at the national level to ensure competition can thrive. Post-shutdown, Bolt! customers have been invited to switch to First Media's Homepass cable-based broadband services.

(January 2, 2019) telegeography.com

## Italy

The Communications Regulatory Authority (Autorita per le Garanzie nelle Comunicazioni, Agcom) has rejected proposals put forward by Telecom Italia (TIM) for the spin-off of its fixed networks business into a separate, wholly-owned division. According to a report from Bloomberg, Agcom fears that the separation would not help boost competition in the domestic market and would let the incumbent benefit from 'a significant competitive advantage', except in Milan where extensive networks have been deployed by rival operators. In addition, a spin-off would not work to ease the regulatory burden. Agcom is opening a 45-day public consultation to enable interested parties to comment on its decision, following which it will issue its final verdict. There have been calls within Italy for TIM to carry out a full structural split and for its network assets to be merged with those of state-backed wholesale infrastructure provider Open Fiber. Meanwhile, TIM has issued a profit warning ahead of the release of its full-year 2018 financial results. The telco is expecting core earnings to fall by a mid-single digit figure. TIM shareholders Vivendi and Elliott Advisors are currently locked in a battle for control of the company, with a meeting scheduled for 29 March to vote on a proposal by Vivendi to replace five board members nominated by Elliott. (January 21, 2019) reuters.com

## Kosovo

Sector watchdog the Regulatory Authority for Post and Electronic Communications (Autoriteti Rregullator i Komunikimeve Elektronike dhe Postare, ARKEP) has identified fixed line incumbent Kosovo Telecom as having significant market power (SMP) in the local loop unbundling (LLU) segment on the basis that the company has 100% participation in the space and has infrastructure that is not easily duplicated. As such, the regulator imposed new measures on the telco, including obligations for access, non-discrimination and transparency, whilst the company is also subject to pricing controls. Under the latter requirements, ARKEP stated that Telecom would use a 'retail minus' to ensure that its prices were fair, although the watchdog may intervene and set new prices via benchmarking or bottom-up models. ARKEP's decision also removed previous requirements for the telco to separate its accounts. Similarly, cableco IPKO was designated an SMP player in the wholesale broadband access market and ARKEP imposed the same obligations on the operator. In a related development, ARKEP opened to public consultation a draft document on the calculation of the weighted average cost of capital (WACC) for the provision of mobile telephony services in Kosovo. ARKEP intends to use the WACC rate as part of future price control measures on SMP operators in the wireless segment. The regulator noted that it did not have access to all of the data needed for the calculation, and utilized a benchmark method instead, recommending WACC values of 10.17% after tax and 11.3% before tax. The consultation is due to close on 19 January 2019. (January 10, 2019) telegeography.com

## Latvia

Latvian telecoms watchdog the Public Utilities Commission (Sabiedrisko Pakalpojumu Regulesanas Komisija [SPRK]) has issued a decision to terminate Lattelecom's concession to use 5G-compatible spectrum in the 1427MHz-1452MHz/1492MHz-1517MHz band. The cancellation will come into effect from 1 January 2021. In its notification, the regulator explained that under the national radio frequency plan, the aforementioned range is due to be released on 31 December 2020. 'The purpose of the radio frequency plan amendments is to re-plan the use of the bandwidth from fixed to mobile communications,' the SPRK noted, adding: 'The regulator can now start to plan the granting of rights of use and redistribute the entire range so that, from 1 January 2021 onwards, operators who have received the rights of use can be fully utilize the range.'
(January 17, 2019) telegeography.com

## Macedonia

The Agency for Electronic Communications (AEK) has announced its intent to conduct a public tender for the award of spectrum in the 2100MHz band. Macedonia's industry regulator will look to auction one license for a 2×15MHz block (1965MHz-1980MHz/2155MHz-2170MHz) for a minimum price of MKD9 million (USD166,680), which will have nine years validity (until 2028). All interested parties have been given until 20 January to notify AEK of their interest. The regulator has previously awarded spectrum in the same frequency band to one. Vip (1935MHz-1945MHz/2125MHz-2135MHz) and Makedonski Telekom (1950MHz-1965MHz/2140MHz-2155MHz), which are valid until February 2028.
(January 2, 2019) telegeography.com

## Mozambique

The merger of Mozambique's state-backed telecoms operators Telecomunicacoes de Mocambique (TDM) and mCel has been completed. The enlarged firm has been rebranded Mocambique Telecom and is operating under the new name Tmcel. The government hopes that the combination of its fixed line and mobile units will reduce operating costs and help promote converged fixed-wireless packages. Tmcel is the country's second largest mobile provider in subscriber terms behind Vodacom, while it also dominates the fixed line sector.
(January 21, 2019) telegeography.com

## Myanmar

The Post and Telecommunications Department (PTD) of Myanmar's Ministry of Transport and Communications (MOTC) has published a draft decision report on a framework of rules to govern so-called 'vanity numbers'. Industry stakeholders are invited to submit comments on the report by 8 February 2019. The guidelines set out definitions for vanity numbers – phone numbers with consecutive numbers or a repeating patter – the terms for their allocation and clarifies the rights of the firms allocated the numbers as well as the users to whom they are issued. Included in the guidelines is a requirement for licensees to maintain a database of the vanity numbers it has issued, alongside the identity of the purchaser, the method by which the number was assigned and the price paid for the number. Operators are also forbidden from branding vanity numbers nor associating certain numbers with a particular provider. Further, the regulations will not be retroactive, so subscribers that already use numbers which could be classified as vanity numbers will not be affected.
(January 17, 2019) telegeography.com

## Nigeria

The Nigerian Communication Commission (NCC) has granted additional nine telecommunications companies, Value Added Services (VAS) aggregator license to deepen the VAS market. The NCC board had considered and made recommendation that I-Cell Media Limited, Nine Jojar Limited, 21st Century Technologies Limited, Nitro Switch Limited, HML Consulting Limited, Cognys Systems Limited, Perpetual Communications Limited, Mobile Intelligence Limited, and Iyke Jordan Limited be used with VAS Aggregator license. The companies would now compete in the over $200 million Nigeria VAS market controlled by the major four mobile network operators. Recently, NCC announced that it would harmonize and sanitize the short code system and ensure that those used for similar services are also similar. Under the new system, code for checking airtime balance would be same for all the networks, likewise for data balance and other services. Current codes being used by the telcos would run concurrently with the new codes for 12 months and 12 months for VAS providers, after which the old would be phased out. Meanwhile, the Commission said there was no going back on its ban of auto-renewal of telecoms services, which include VAS. This came on the heel of appeals by the VAS providers who claimed that their businesses have crumbled as a result of the ban. Speaking at the recent VAS forum in Lagos, NCC's director of enforcement and compliance monitoring, Mr. Efosa Idehen, said ongoing investigations across the networks have shown rampant cases of forceful subscriptions. Many subscribers were being charged for services they never subscribed and that was because they were able to auto-renew such services. He however, admitted that the audit also showed some VAS providers doing their legitimate businesses on the networks without subscribing for people forcefully. He said the audit of the mobile networks' systems was still ongoing and would be concluded by first quarter 2019, after which recommendations would be made and fresh decisions taken by the regulator. He urged WASPAN as industry association to do a self-assessment and weed out the bad eggs among them before the regulator takes its final decision. NCC had issued Direction to Service Providers on forceful subscription of data services and Value Added Services (VAS) which directs service providers to desist from forceful/automatic renewal of data services without prior consent of subscribers. This has taken effect from May 21, 2018.
(January 21, 2019) leadership.ng

## Norway

Following changes to the departmental structures of Norway's government ministries, it has been confirmed that the National Communications Authority (Nasjonal kommunikasjonsmyndighet, Nkom) will now operate directly under the auspices of the Ministry of Local Government and Modernization (Kommunal- og moderniseringsdepartementet, KMD). With the change in oversight for the Nkom – the industry watchdog previously answered to the Ministry of Transport and Communications (Samferdselsdepartementet ar, MoTC) – the government has also established a new ministerial position for ICT policy, with Nikolai Astrup becoming Norway's Minister of digitization at the KMD.
(January 24, 2019) telegeography.com

The National Communications Authority (Nasjonal

kommunikasjonsmyndighet, Nkom) has confirmed that it will impose a NOK4 million (USD468,000) fine on Telenor Norge. In November 2018 the Nkom initially announced the fine, claiming that Telenor had provided incomplete and inaccurate information ahead of a scheduled margin squeeze test which had been undertaken in the autumn of that year. Now, having considered Telenor's comments regarding the matter, the regulator has confirmed the financial penalty will stand. In a related decision, meanwhile, the Nkom – which had directed Telenor to reduce the wholesale prices for altnets renting access to its mobile infrastructure, following the margin squeeze test it carried out in November 2018 – has confirmed that it will not need to take any further action in this area, after Telenor voluntarily reduced the prices with effect from 1 December 2018. (January 17, 2019) telegeography.com

## Philippines

The Philippines' government has passed new legislation aimed at facilitating telecommuting, and the Department of ICT (DICT) is urging operators to ensure workers have access to reliable internet connections. The new Telecommuting Act institutionalizes telecommuting as an alternate work arrangement for private sector employees. It states that private sector employers may offer telecommuting programs to employers on a "voluntary basis," and obliges employers to provide written information about the terms and conditions of such a program. In addition, the new Act stipulates that these terms and conditions must abide by labor laws, such as mandatory overtime, rest days and entitlement to leave benefits. The new law is aimed in part at easing traffic congestion in metropolitan areas, according to DICT acting secretary Eliseo M Rio. "It is high time to adopt policies that promote ICT solutions to our daily problems such as traffic, and the telcos must embrace their role in these initiatives and see it as opportunities," he said. "The ball is now on the telcos' court to gear up for the possible increase of demand for faster and more reliable internet connection... the government is upping the ante when it comes to investing on ICT projects, but if we wish for impact to be felt by the people sooner, we expect the telcos to do the same." (January 14, 2019) telecomasia.net

Eliseo Rio Jr., the Acting Secretary of the Department of Information and Communications Technology (DICT) in the Philippines, has said that the country's New Major Player (NMP) – currently Mindanao Islamic Telephone Company (Mislatel), which is undergoing a post-qualification process – will be operational by the middle of this year, despite 'concerns' raised in a legal case over the selection of the so-called 'third telco'. The DICT official has moved to reassure the country's president Rodrigo Duterte that Mislatel is expected to emerge from the 90-day post-qualification phase in good shape and fulfil Duterte's stated aim to break the de facto duopoly of PLDT Inc. and Globe Telecom. For its part, Mislatel – the joint venture of China Telecom, Davao tycoon Dennis Uy's Udenna Corp and its subsidiary Chelsea Logistics Holdings Corp – has called on unsuccessful bidders in the NMP process to partner it to achieve a faster rollout of facilities. Indeed, in a statement issued on 20 November 2018, Mislatel Consortium spokesperson Adel Tamano said: 'In fact, even telco players that did not win the bid or decided not to bid, such as PT&T, Converge, etc. can partner with us and we can use their existing telecommunications facilities for a faster rollout'. Echoing this, Rio has gone on record as saying that one of the best ways Mislatel can comply with its commitments is to use all existing facilities and services of the other small players, such as 'the tens of thousands of kilometers of fiber-optic cables of PT&T and Converge ICT, the satellite network of Chavit Singson's SEAR and the fiber-over-the-air of NOW, etc.' The DICT acting secretary added that while PLDT and Globe tend to treat these smaller players like customers, Mislatel 'can treat them as partners, even sharing its facilities and frequencies with them'. Meanwhile, in additional moves to improve the telecoms landscape, Rio noted that: 'Pending laws will soon be enacted like number portability, open access, PSA allowing more than 40% foreign ownership of telcos, equitable distribution of spectrum and spectrum management reform, etc., that will make possible the entry of a fourth, even a fifth major telco player'. (January 13, 2019) telegeography.com
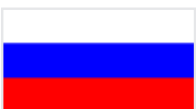
## Russia

In its final meeting of 2018, Russia's State Commission on Radio Frequencies (SCRF) allocated 5G pilot frequencies in selected zones, in the 4800MHz–4990MHz and 27.1GHz–27.5GHz bands. Territories for pilot 5G allocations include Moscow, St. Petersburg, Yekaterinburg, Kazan, Kaliningrad, Derbent, Kemerovo, Krasnodar, Murmansk, Sochi, Tomsk, Ulyanovsk, and the Republic of Tatarstan. Pilot spectrum permits are open to all applicants (actual applicants yet to be confirmed). (January 4, 2019) telegeography.com

## Taiwan

The government plans to lower the frequency usage fee for telecoms by adjusting frequency band coefficients to encourage the development of 5G service, the National Communications Commission (NCC) announced. NCC spokesman Wong Po-tsung said the commission approved the proposed adjustment to the frequency usage fees at a meeting. The revised coefficients must be made available to the public for two months before they take effect, he added. During the review period, members of the public are encouraged to comment on the standards, Wong said, adding that the commission would take any comments into consideration before finalizing the changes. The adjustment was primarily proposed because the nation is to auction off bandwidth to be used for 5G so that the service can be developed by 2020, Wong said. The commission also adjusted frequency band coefficients, as 5G service uses mostly high-frequency bandwidths, which have different physical properties and coverage ranges from lower-frequency spectrums. Previously divided into three frequency bands for calculating usages fees, the proposal would divide the spectrum into four frequency bands: below 1GHz, 1GHz to 3GHz, 3GHz to 6GHz and 6GHz and above, with coefficients of 1, 0.75, 0.18 and 0.004 respectively. The coefficient enables frequency usage fees to be adjusted according to the usability of the license holder's frequency band, the commission said. Revenue from usage fees has gradually increased over the past few years: NT$2.42 billion (US$78.74 million) in 2015, NT$2.76 billion in 2016, NT$3.36 billion last year and NT$3.56 billion this year, NCC statistics showed. The adjustment is expected to save telecoms an estimated NT$500 million following the fee adjustment, Wong said. The commission has also adjusted the coverage coefficient to encourage telecoms to build infrastructure in rural areas, because signal coverage in some of the nation's remote areas and along some of its transportation routes remains low. The adjusted coefficient would also reduce frequency usage fees for telecoms working to improve signal reception in the tunnels along the North Link and the South Link rail lines, Wong said. (December 30, 2018) taipeitimes.com

## Thailand

The National Broadcasting and Telecommunications Commission (NBTC) board has approved a draft document containing the auction conditions for the 700MHz spectrum auction. The regulator will tender seven slots of 5MHz each, with 20-year validity. Winning bidders will have to pay a 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. A public hearing is expected to be held in February, with the auction currently slated for May 2019. Takorn Tantasith, Secretary General of the NBTC, said: 'Several important details have to wait for opinions from the public hearing before the announcement of official conditions, including reserve price, terms of network rollout requirements, the number of licenses, valid terms of license and payment terms.' (January 16, 2019) The Bangkok Post

The NBTC is hoping to prepare the workforce for 5G, which is expected to bring benefits to industry and create disruption in the existing workforce. The telecom regulator plans to start a digital literacy program for the public, spanning 18 months, to mitigate the impact of unemployment from digital disruption and prepare the workforce for 5G wireless broadband adoption in 2020. The move is in collaboration with telecom vendors Huawei Technologies and Ericsson, the three major mobile operators, and Chulalongkorn University. 5G technology infrastructure will bring benefits to vertical industries, but also create disruption to existing workforces and organizational management, said Takorn Tantasith, secretary-general of the National Broadcasting and Telecommunications Commission (NBTC). "When 5G adoption comes to the market in 2020, it will create a wave of change to vertical industries, and the domestic economy could transform from industry-driven to innovation-driven, pushing smart industries, smart cities and smart people," Mr. Takorn said. He said the forum will include facts for the upcoming change, digital literacy, updated case studies and opportunities in the digital era. (January 8, 2019) bangkokpost.com

Some 1.8 million registered low-income earners in remote areas will have home internet for free for three years under a National Broadcasting and Telecommunications Commission project. NBTC Secretary General Takorn Tantasith said as part of its Universal Service Obligation (USO) project aimed at bridging the digital divide, 6.3 million people, or 2.1 million households, in 3,920 remote villages will have internet access by next year. From 2019-24, the NBTC will install 5,229 free public Wi-Fi access points in these villages. In addition, 1,210 schools and 107 tambon hospitals will have broadband links. A total of 763 USO Net centers will also be built. Each will be equipped with 12 PCs and manned by IT technicians who can give technical advice to users. For home internet, the villagers in remotes areas can subscribe to 30/10 Mbps internet service for 200 baht per month from May 1 next year to April 30, 2024. Since some households currently cannot afford the fee, the NBTC will subsidize the 200-baht rate for three years or until April 30, 2022 for low-income earners in the areas who have registered with the government's welfare card program. Under the USO project, all villages in

Thailand will have access to broadband. The project groups 74,987 villages nationwide into economic areas (30,635 villages), rural areas (44,352) and remote areas (3,920). Telecom companies are required to provide internet access to the economic areas and they have already completed the task. For the rural areas, the Digital Economy Ministry is in charge of providing access to 24,700 villages while the NBTC takes care of the remaining 15,732 villages. For the remote areas, the NBTC will have completed the task with the launch of the internet project for remote areas in May next year. Mr. Takorn said the USO project will give all people equal access to new government services such as tele-education or remote learning; telehealth, which provides health care advice online, and telemedicine, which allows patients to consult doctors online. The USO project is financed by the USO fund which is contributed by telecom operators as percentages of their revenue.

(December 25, 2018) bangkokpost.com

## Uganda

The ICT Ministry will expect major telecoms operators in the country to list at least 30% of their shares on the local stock market as part of new licensing conditions. The main targets of the move are foreign-owned operators MTN Uganda and Airtel Uganda, which between them control almost 90% of the local mobile market. MTN is currently operating under a temporary concession as it awaits news on the renewal of its license, which expired in October. The country's President, Yoweri Museveni, recently criticized the Uganda Communications Commission (UCC) for saying that MTN would be charged USD58 million for the ten-year renewal instead of the USD100 million fee which was set initially. Ugandan authorities stated in June last year that telcos would face stringent new rules when renewing licenses, including the requirement for partial local ownership, higher network coverage targets, and stricter controls on quality of service (QoS) levels.

(January 22, 2019) The Independent

## United Kingdom

Ofcom is holding public meetings in Belfast, Cardiff, London and Edinburgh this month to gain feedback on our proposed Annual Plan, which outlines the planned areas of work for the next financial year. Ofcom wants to make sure that people and businesses in the UK get the best from their communications services. We aim to do this by encouraging competition; securing standards and improving quality; and protecting consumers from harm. Those with an interest in Ofcom's work are encouraged to attend one of the meetings, which offer an opportunity to comment on our approach to TV, Radio, Telecoms, Postal and Wireless Communications Services. Each event will begin with a brief presentation, after which there will be an opportunity to comment and ask questions. All meetings are open and free of charge. Further details are available online. The views expressed in the meetings, together with responses to Ofcom's consultation document, will help inform our final Annual Plan statement for 2019/20, which is due to be published in March.

(January 8, 2019) southgatearc.org

Landline telephone use has been halved in the last six years while mobile data has increased tenfold during the same period, according to a study by Ofcom. The number of minutes of calls made from a landline has decreased dramatically, from 103bn in 2012 to 54bn in 2017. During the same period the number of mobile phone call minutes increased from 132.1bn to 148.6bn as smart phones have increasingly cemented their dominance. The average monthly mobile data usage was almost ten times higher in 2017 than 2012, rising from 0.2 gigabytes to 1.9 gigabytes over the six years with messaging and social media apps becoming increasingly popular. The research from Ofcom also revealed that there is a generational divide when it comes to understanding area codes from landline numbers, with older people more likely to recognize whether a number is local to them and can be trusted. "Some of us can remember a time when we stored phone numbers in our head, rather than our mobile. But the way we use and feel about telephone numbers is changing," said Liz Greenberg, head of numbering at Ofcom. "In the future, as more calls are made over broadband, dialing codes won't need to be fixed to a particular part of the country. So the question is – could area codes become a thing of the past?" Ofcom are exploring how to better manage landline numbers, particularly for business use.

(January 5, 2019) cityam.com

## United States

The Federal Communications Commission (FCC) has confirmed that Auction 101 – its sale of licenses in the 27.5GHz–28.35GHz (28GHz) band – has concluded after 176 rounds of bidding. The auction generated total bids of USD702.57 million, with offers for 2,965 of the 3,072 available licenses. The identities of winning bidders will remain private until after the close of bidding in Auction 102, the upcoming auction of 24.25GHz-24.45GHz and 24.75GHz-25.25GHz (24GHz) licenses, which has been scheduled to commence as soon as the 28GHz sale process concluded.

(January 25, 2019) telegeography.com

The FCC says it will suspend most of its operations January 3 if the federal government shutdown is not resolved before then; however, the 28 gigahertz spectrum auction, which was previously scheduled to resume Jan. 3, will go forward without interruption. Bidding activity in Auction 101 continued to dwindle leading up to the holiday break. In round 88, the final round of bidding prior to the holidays, provisionally winning bids reached a combined total of $689,885,660. The total amount of money pledged by bidders increased $75,800 during round 88, representing a .01% increase in total provisionally winning bids. The highest bid during round 88 went to Dubuque, Iowa, at $422,000, and the lowest bid of $2,300 went to Bosque, Texas. The FCC's first auction of millimeter wave spectrum will end when a round of bidding closes with no new bids. The next round of bidding will resume Jan. 3 at 10 a.m. EST. The total amount bid in Auction 101 has waned with each subsequent round of bidding. Round-to-round percentage increases have been less than 1% since the 49th round of bidding on Dec. 7. There were 22 new bids in round 88. If the current pattern holds, Auction 101 should be coming to a close very soon. In the event of a continued impasse over federal government funding, the FCC plans to halt many operations in the middle of the day on Jan. 3, giving employees up to four hours to complete an orderly shutdown. The agency says work required for the protection of life and property will continue, and the Office of Inspector General will also continue operations until further notice. A public notice detailing the effects of the suspended operations (PDF) has been posted to the FCC's site. Suspended activities include consumer complaint and inquiry phone lines, consumer protection and local competition enforcement, licensing services, radio spectrum management and new equipment authorizations. The FCC expects 1,442 employees to help with the partial suspension of activities. The FCC chairman, three commissioners and up to 200 employees will continue working, because their compensation is financed outside of annual appropriations. All employees will be expected to return to work on the next scheduled work day after the furlough ends.

(January 2, 2019) fiercewireless.com

## Uruguay

The government plans to hold an auction for spectrum in the 600MHz and 2.5GHz band this year, Busqueda reports, citing government sources. The spectrum sale has been scheduled to take place in mid-2019, with the aim of enabling the provision of 5G communication services by mobile operators. The amount of spectrum that will be made available to operators is still being examined, the sources added, although the 600MHz band needs to be freed up by cableco Cablevision before it can be reallocated, a process which is expected to be completed by July. The Uruguayan mobile sector is home to three wireless operators, namely state-owned Administracion Nacional de Telecomunicaciones (Antel), Telefonica of Spain subsidiary Movistar, and Claro, owned by America Movil.

(January 10, 2019) Busqueda

## Zimbabwe

The government said it will consult the public over the Cyber Crime and Cyber Security Bill shortly, Chronicle reported. The Information and Communication Technology Parliamentary Portfolio Committee said the bill seeks to provide for and to consolidate cyber-related offences with due regard to the Declaration of Rights under the Constitution and the public and national interests. (January 7, 3019) telecompaper.com

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