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SAMENA TRENDS

EXCLUSIVELY FOR SAMENA TELECOMMUNICATIONS COUNCIL'S MEMBERS

BUILDING DIGITAL ECONOMIES

Featured

UAE All Ready for 5G

Eng. Saleh Al Abdooli

Chief Executive Officer, Etisalat Group

THIS MONTH

SATELLITE AND TERRESTRIAL COMMUNICATION SYSTEMS CONVERGENCE

It is with great pleasure that we invite you to attend the third annual Huawei Middle East Innovation Day – "Innovate for a Digital Middle East"–

Date & Time: 09:00–17:00, Monday, October 15, 2018 (GITEX Day 2)
Location: Sheikh Maktoum Hall, Dubai World Trade Centre

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CONTENTS

CONTENTS

Satellite and Terrestrial Communication Systems Convergence

The on-going development of 5th Generation communication networks may provide a good or, an inevitable opportunity, for the integration of satellites with terrestrial networks. It certainly provides food for thought that working closely with the terrestrial sector in areas of mutual interest, such as interoperability, network orchestration, spectrum use, coverage extension, so on and so forth, may be required for achieving true digital transformation and development of the digital economy.

Future systems will need to embody connections to billions of objects or "things", which raises new challenges. Visions for 5G now exist across all regions of the world and both research and harmonization efforts are ongoing towards new standards and developing the 5G ecosystem. Building the 5G ecosystem requires the implementation of dense networks of small cells operating in the millimeter wave bands, which are adaptable and software controlled. Along with this satellite play may also find its essential place, especially with respect to the need for extended technology coverage, distribution of digital content, improving network resilience and robustness, utilization of spectrum resources more efficiently, among other features.

The underlying objectives that point to potential integration, or convergence, of terrestrial and satellite systems, are driven by industry-wide expectations of a thousand-fold data requirement over the next two years, especially due to the demand for video content. However, delivering on many of these expectations requires spectrum resources - which, per common knowledge, are very limited, and even techniques such as spectrum aggregation or spectrum sharing may not sufficiently address the actual issue. This is where the concept of densification emerges, whereby a given area is designed to experience spectrum efficiency through a heterogeneous network where spectrum can be dynamically adapted according to user demand and signaling requirements, to be able to adopt new digital services. Excessive or inefficient signaling has been among the impediments for adopting new digital services, and 5G systems will improve upon this issue; and could be facilitated with selected, integrated satellite capability.

One of the key drivers of 5G is the emergence of IoT and the vision of billions of objects being connected to the Internet. This, in turn, is one of the key enablers of the smart environment and smart connectedness, which is so central to the notion of building smart cities. For 5G to be successful and to deliver is intended and timely impact, the implication is clear: there needs to be an ability to handle large quantities of data and provide access to a large number of connected users and devices. To this effect, it is natural to predict the impact of satellites on providing wider coverage to complement and to extend the dense terrestrial cells, which is in line with the ubiquitous coverage targeted by 5G networks.

Many arguments could be presented to support integration of terrestrial networks with satellite; one of which, for example, could be improving the quality of digital experience through intelligent traffic routing with regard to video delivery and transmission. Or, as another example, offloading traffic from the terrestrial system to satellite in order to save terrestrial spectrum.

Thus, in view of the plethora of digital services that next-generation networks will support, and to save and efficiently utilize spectrum resources, we may exert ourselves toward convergence between between 5G and satellite technologies. However, this requires aligning private sector priorities and public sector policy visions.

SAMENA Council's terrestrial and satellite members need to bring this matter under discussion, and we look forward to supporting their knowledge-creation and collaboration building needs.

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

UAE All Ready for 5G

The year 2018 has seen the Middle East's telecommunications business heavily focus on 5G development and trials, on optimizing business processes, innovating in terms of availability of new digital services, continuing with customer-experience management strategies developed over the past two years, improving quality of service, attaining infrastructure agility and optimization including through SDN and NFV technologies, and dealing with the over-the-top (OTT) situation, which has presented the industry with both challenges and opportunities. These trends have also been driven by regulatory shifts taking place under the "digital transformation" visions toward creating level-playing fields for all digital service providers.

The telecom industry has now reached a point where its role is that of an enabler of growth and to help set the agenda for human progress and development by opening doors to the digital economy. With the emergence of 5G, these doors of digital economic development will meet reality. As fifth-generation network technologies surface visibly in the communications scene, three key factors are expected to further catalyse the growth of the telecoms industry: persisting low penetration levels in the fast-growing markets of Asia and Africa; young populations ready for and expecting more digital services; and the well-recognized power of the telecom sector to propel socio-economic development and move entire communities to enjoy the benefits of the latest ICT technologies.

The Middle East's mobile market, led by the likes of Etisalat, which first started to develop 5G in early-2014[1], is indeed ripe with opportunities for investment and new digital services, primarily due to its large young and tech-savvy populations and increasingly progressive outlook as regional regulatory bodies pursue the path to digital transformation.

[1] Etisalat and Huawei's 5G development of 5G mobile broadband first reported in Khaleej Times and Arab Times on March 2, 2014

UAE'S SIGNIFICANCE & PARTICIPATION IN GLOBAL ICT DEVELOPMENT

The UAE occupies a strategic position in the Middle East and in the global ICT arena for multiple reasons, including for its strides development and innovative use of digital communications technologies across all walks of life. The Emirates' ICT indicators[2] speak volumes about the progress that the country has made in the region with respect to prioritizing ICT development. The country has been:

UAE's Achievements

- First in highlighting the importance of ICT to government vision
- First in achieving mobile network coverage
- First in government procurement of advanced technologies
- Second in achieving broadband subscriptions per 100 inhabitants
- Second for having the lowest level of government regulations
- Fourth in attracting Foreign Direct Investment and technology transfer

Arguably, the UAE's digital communications sector is the most developed in the SAMENA region, and has a solid connectivity foundation, which includes exceptionally high technology coverage and service penetration rates, including that of optical fiber. Core strengths of this sector are the government's ICT vision and the creation of a corresponding and desired business environment, and the tech-savvy population. The country ranks first in the Arab World in the Network Readiness Index. Active mobile subscriptions have continued to rise, with a penetration rate of 209.8%, based on figures reported in the Seventh Annual Sector Review of the UAE Telecommunication Regulatory Authority (TRA). This percentage represents one of the highest mobile penetration rates in the world. Moreover, the UAE has set clearly defined objectives, created world-class telecom infrastructure, and the imminent introduction of 5G will significantly further enhance the standard of government service delivery, bringing forth unprecedented value for the Industry and the public.

What, in part, has driven the UAE's accelerated move toward embracing the latest digital communications technologies is the upcoming Expo 2020. The Expo in Dubai deserves a world-class telecom system which will enhance visitor experience and strategically position the UAE. The Expo is a reflection of the goals of the UAE Vision 2021, which includes the nation being ranked first globally in overall ICT infrastructure, Online Services Index and the Network Readiness Index, as the UAE celebrates its 50th year of formation in 2021. The UAE's candidacy for the re-election to the ITU Council for the period 2019 to 2022 further marks the country's latest endeavour toward occupying a well-deserved place in the global decision-making arena.

The Middle East's mobile market, led by the likes of Etisalat, which first started to develop 5G in early-2014, is indeed ripe with opportunities for investment...

TRIALS AND PROGRESSION TOWARD REGIONAL 5G READINESS

Talks of 5G planning and development in the region started over five years ago. Various developments, trials, and demonstrated proofs of concepts have taken place over the past few years, proving that the region is, in fact, well on its way to becoming among the earliest pioneers to adopt and foster 5G evolution.

- Etisalat, as far back as March 2014, pioneered 5G mobile broadband establishment through an agreement with Huawei to develop the 5G Network in the UAE.
- Bringing the 5G plans to fruition, at GITEX October 2016, Etisalat practically demonstrated the region's fastest trial of 5G at that time, reaching speeds of 36Gbps. Etisalat went on to break its own record in 2017 by announcing its fastest 5G live trial reaching 71Gbps setting a global record in the industry and showcasing exclusive 5G demonstrations at GITEX Technology Week.
- In January 2017, Saudi Telecom Company (STC) successfully carried out an experiment that would lead towards the deployment of the 5G mobile services. It said it reached 70 Gbps, calling this a record at that time in the speed of mobile data services[3]. STC trialed Massive multiple-input, multiple-output (Massive MIMO) technology on its existing time division duplex LTE (TD-LTE) network

[2] According to data shown for the UAE's IT Council membership candidacy
[3] https://www.lteto5g.com/stc-reaches-70-gbps-5g-test/

in Dammam in cooperation with equipment vendor Huawei[4].

- In January 2017 also, Turkcell and Ericsson announced the completion of the first 5G trial in Turkey, achieving transmission speeds of 24.7 Gbps using the 15 GHz band[5]. Running up to the World Mobile Congress Shanghai 2018, Turkcell successfully tested TM9 commercial networks in its TechCity in June 2018. Data for speeds achieved of these commercial networks in not available.
- In February 2017, Nokia and Zain trialed multiple, advanced 4.5G features to achieve higher throughput on path to 4.5G Pro, 4.9G and 5G[6]. Advanced 4.5G features such as multi-band carrier aggregation, higher order modulation and higher MIMO (Multiple Input, Multiple Output) allow operators to increase network capacity and speed with existing radio network resources and available spectrum bands.
- In June 2017, during the field trials, du achieved record-breaking cell capacity that exceeded 700Mbps using a single carrier of 20MHz. du is also the first in the region to utilise three simultaneous carriers totaling 60MHz which brings the cell capacity to more than 2.1Gbps[7]. In May 2018, du deployed the first site at its headquarters in Dubai Media City by achieving a download throughput of 1.5Gbps.
- In September 2017, Zain Kuwait achieved 70Gbps downlink in 5G trials using 2GHz spectrum[8]. By mid 2018, Zain launched the first integrated 5G technology on its network, which will provide high-speed communications with high efficiency[9].
- In May 2018, while launching the commercial network, Etisalat showcased downlink throughput of more than 5Gbps on the site level and more than 1.5Gbps on the commercial CPE (customer premises equipment) device[10].
- Subsequently, in August 2018, Etisalat and Ericsson successfully conducted a live on-air trial of Ericsson Radio System and Massive MIMO technology in the UAE, paving the way towards 5G deployment[11]. In the lead up to the 5G deployment in the UAE by 2020, Etisalat's live trial of over 70 Gbps achieved over a 'pre-commercial' 5G site, operating over e-band using 2GHz of bandwidth as well as massive MIMO (multiple input, multiple output) technology[12].

DEPLOYMENT OF 5G NETWORKS

According to GSMA[13], operators in the Middle East and North Africa (MENA) region could be amongst the first in the world to launch commercial 5G networks. The study made a forecast that there would be more than 50 million 5G connections across the MENA region by 2025, with 5G networks covering approximately 30% of the region's population by that point. The report also highlights how mobile broadband (3G/4G) networks account for about half of total mobile connections in the MENA region today and are forecast to increase to 70 percent of the total by the end of the decade.

More than 72 operators are currently considering 5G, which is three times more than a year ago, and 28 of those have already conducted trials. Most 5G announcements made so far are regional 5G pilots and trials rather than full-scale commercial deployments. There is some way to go before the investment case for operators can be made robustly and before many large-scale commercial deployments can commence.

According to a study, North America leads race towards commercial 5G deployment with Verizon and AT&T aiming to launch commercial 5G services in certain US markets before the end of this year[14]. In the U.S., AT&T and Verizon have plans to launch 5G this year. Verizon is planning to deploy 5G fixed wireless service in Sacramento, Los Angeles, Houston and Indianapolis by the end of this year.

[4] https://www.telegeography.com/products/commsupdate/articles/2017/04/05/stc-huawei-trial-massive-mimo-in-dammam/
[5] http://telecoms.com/478889/turkcell-and-ericsson-hit-25-gbps-in-5g-test/
[6] https://www.nokia.com/en_int/news/releases/2017/02/21/nokia-and-zain-saudi-arabia-trial-multiple-advanced-45g-features-to-achieve-higher-throughput-on-path-to-45g-pro-49g-and-5g
[7] https://www.khaleejtimes.com/business/telecom/du-steps-up-5g-readiness-with-record-breaking-trial
[8] https://www.telegeography.com/products/commsupdate/articles/2017/09/12/zain-achieves-70gbps-downlink-in-5g-trials/
[9] http://www.arabtimesonline.com/news/zain-launches-1st-integrated-5g-network-in-kuwait/
[10] https://gulfnews.com/business/sectors/telecoms/etisalat-launches-first-commercial-5g-network-in-mena-1.2221235
[11] https://www.ericsson.com/en/news/2018/8/etisalat-and-ericsson-trial-massive-mimo-technology-in-the-uae
[12] https://gulfnews.com/business/sectors/technology/etisalat-achieves-71gbps-live-trial-on-5g-network-1.2102533
[13] Report, titled The Mobile Economy: Middle East and North Africa 2017
[14] https://www.rcrwireless.com/20180822/5g/north-america-leads-race-towards-commercial-5g-deployment-study-says

China has also launched various 5G scale test and application pilot programs, while local governments are setting 5G coverage schedules and accelerating infrastructure construction, as the country races to seize the advantage of 5G technology. However, according to the Ministry of Industry and Information Technology (MIIT), China will realize 5G commercialization by 2020[15].

The year 2018 has see saw a flurry of 5G activity with three Middle East's service providers claiming the world's first 5G networks[16]. Most significant developments, led by major Telecom Operators in the MENA region, include following:

Etisalat, UAE

Following on from its ground-breaking agreement announcement with Huawei in March 2014 to establish 5G in UAE, going on to record-setting live trails at GITEX 2016 (achieving speeds of 36Gbps), and then breaking their own record a year later in GITEX 2017 with its fastest 5G live trial reaching 71Gbps setting a global record in the industry, Etisalat continued to blaze ahead.

By December 2017, Etisalat had already launched a pre-commercial 5G network supporting high-speed low latency 5G use cases based on a drone equipped with a 360-degree VR camera delivering 4K streaming experience. This pre-commercial launch was delivered over the C-band (3.3–3.8GHz).

Following the pre-commercial launch, during mid-May 2018, Etisalat successfully launched the first commercial 5G C-band wireless network and thus became the first telecom operator in the Middle East and North Africa (MENA) region to achieve this technological milestone. The next milestone in 5G was the announcement of the first 5G commercial network at Expo 2020 in the MEASA region making it the most connected place on earth with a network bandwidth that will exceed

10-20 times of today's consumption and capacity. The 5G network will provide next generation user experience to visitors and participants. Moving forward Etisalat has developed a specific plan for a phased approach of 5G rollout in line with device availability, technology standardizations and customer demand.

Partnerships

In May 2017 Ericsson and Etisalat completed a trial of 5G mobile technology with outdoor mobility. The pair said that the trial 'demonstrated 5G capabilities in a real-world environment over a live network, including tests on speed, latency and beam steering'. The test used 800MHz of spectrum in the 15GHz band, achieving an aggregate site throughput of over 24Gbps[17].

In August 2018, Etisalat conducted a live on-air trial of Massive MIMO technology with Ericsson as part of its preparations for the launch of 5G mobile services by the end of this year[18]. According to Ericsson, the deployment of Massive MIMO technology enables the launch of its AIR 6468 5G NR-capable radio solution, an advanced antenna system which is part of the Ericsson Radio System.

du, UAE

In August 2017, du started laying down the ground of 5G[19].

In May 2018, du announced that it will roll out this year a limited service of 5G, the ultra-high-speed mobile broadband that is set to revolutionize the internet ahead of a wider launch next year[20]

Partnerships

Du and Nokia have partnered to trial 3GPP standardized 5G New Radio non-standalone technology, and subsequently deploy live 5G sites in selected areas in the UAE[21].

Saudi Telecom Company (STC), Saudi Arabia

In May 2018, STC launched the first live 5G network in Saudi Arabia, the initial phase of operating the service once 5G becomes generally available.[22]

In January 2017, STC conducted a series of advanced technical experiments and trials on 5G technology as part of the company's strategy of leading technological development and leading modern and advanced services".[23]

[15] https://www.chinamoneynetwork.com/2018/08/16/race-for-5g-deployments-heats-up-across-china
[16] https://thetelecomtimes.com/three-middle-east-service-providers-claim-worlds-first-5g-networks.html
[17] https://www.ericsson.com/en/news/2017/4/ericsson-and-etisalat-conduct-5g-trial-with-outdoor-mobility
[18] https://www.telegeography.com/products/commsupdate/articles/2018/08/01/etisalat-trials-massive-mimo-with-ericsson/index.html
[19] https://www.commsmea.com/17491-du-lays-groundwork-for-5g
[20] https://www.thenational.ae/business/technology/du-plans-roll-out-of-5g-network-in-the-uae-this-year-1.732510
[21] http://www.itp.net/616674-du-and-nokia-extend-5g-cooperation
[22] http://www.itp.net/617128-stc-launches-first-live-5g-network-in-saudi-arabia

Partnerships

In February 2018, Huawei signed 5G MoUs with STC and Mobil and the agreement with STC was to focus on innovation of 5G technologies and joint efforts to develop the 5G roadmap.[24]

In March 2018, Nokia secured a 5G carrier deal in Saudi Arabia[25]. STC and Nokia announced that they are collaborating to launch STC's 5G network and agreed to collectively work toward finding the most optimal network strategy and relevant use cases for 5G deployment in the Saudi market. As a first step, hundreds of 5G base stations are planned to be deployed in the Kingdom's western region (Makkah, Madinah and Yanbu).

In May 2018, Saudi Telecom Company (STC) and Cisco announced they have signed a Memorandum of Understanding (MoU) and intend to collaborate on the development of 5G communication systems and networks. The joint effort aims to facilitate STC's transformation into a digital service provider and supports the pivotal role it plays in enabling Saudi Arabia's 2030 Vision and National Transformation Plan[26].

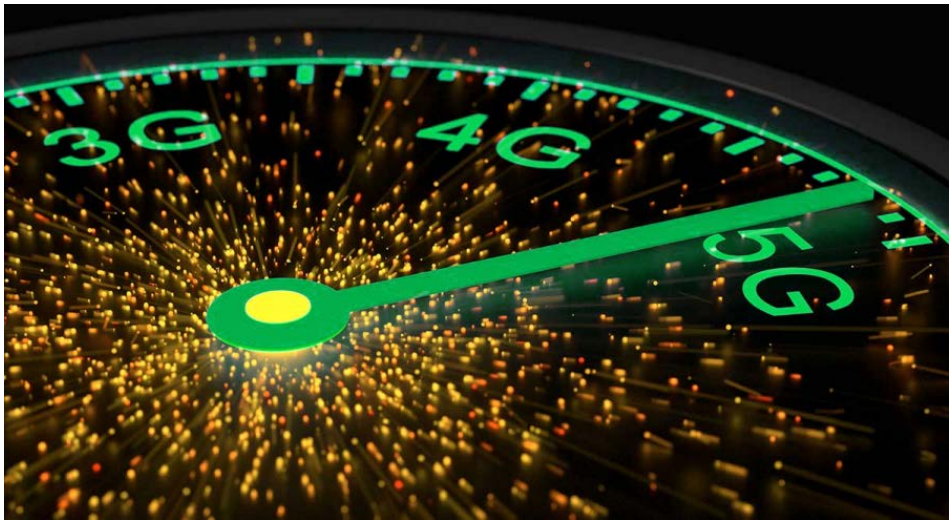
Zain Group, Kuwait

Zain Group, the largest telecommunications company in Kuwait, launched in June 2018[27] the first integrated 5G technology on its network, which will provide high-speed communications with high efficiency.

In 2018, Zain Group announced that it has successfully tested 5G technology achieving maximum throughput speeds of over 70 Giga Bit Per Second (Gbps) over 2GHz spectrum. This speed represents one of the highest-ever recorded in the region, placing Zain at the forefront of 5G innovation for the benefit of its consumer and enterprise customers[28].

Partnerships

In February 2018, Zain Group and Ericsson announced they have signed a Memorandum of Understanding (MoU) to jointly develop and test selected 5G and Internet of Things (IoT) cases. The MoU, signed during Mobile World Congress 2018 in Barcelona, demonstrates the commitment of both companies to bringing next-generation connectivity and its accompanying benefits to the Middle East and Africa[29]. The new partnership will accelerate digitalization in the region, enabling rapid deployment of innovative services in the Internet of Things (IoT) in the coming years. The agreement covers technical demonstrations and strengthens technical cooperation between the two companies and will ensure smooth 4G to 5G evolution across Zain's networks.



Turkcell, Turkey

Turkcell and Huawei set a record in the first 5G millimeter-wave band speed test in June 2017. In the tests, which used 5G equipment and technologies, the download speed tallied 70 Gigabits per second (Gbps), a target difficult to achieve using present-day technology[30].

In May 2018, Turkcell become a member of 3GPP, the most influential global organization in developing the standards in 5G, which is targeted for commercial launch in 2020. By becoming a member of 3GPP, Turkcell will assume an active role aiming at remarkable contributions in the development phases of 5G, viewed as the technology of the future[31].

Partnerships

In February 2018, Turkcell said that it was co-operating with equipment makers Ericsson, Huawei, Samsung and ZTE on research and development ahead of the adoption of next-generation network standard 5G[32]. Turkcell is working to get ready for 5G. We are collaborating with Ericsson, Huawei, Samsung and ZTE on Technology and R&D," the Turkish mobile operator's Chief Executive Kaan Terzioglu told a news conference.

Recently in September 2018, Turkcell and Finland-based mobile phone giant Nokia have signed an agreement to develop new technologies[33]. The two companies will work on the Internet of Things [IoT], smart automobile technologies, online medicine, and automatization for the Turkcell network.

[23] https://www.tahawultech.com/news/saudi-arabias-stc-launches-live-5g-network/
[24] http://www.itp.net/616672-huawei-signs-5g-mous-with-stc-and-mobily
[25] https://www.rcrwireless.com/20180320/5g/nokia-secures-5g-carrier-deal-saudi-arabia-tag23
[26] http://www.arabnews.com/node/1256556/business-economy
[27] https://zain.com/en/press/Zain_launches_5G/
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[32] https://www.reuters.com/article/turkcell-5g/turkcell-prepares-for-5g-in-co-operation-with-samsung-zte-ericsson-and-huawei-idUSL8N1Q63OE
[33] http://www.hurriyetdailynews.com/turkeys-turkcell-nokia-collaborate-on-5g-technology-136616

REASONS WHY UAE WILL WITNESS 5G FIRST

The UAE Government gives great importance to the ICT sector in light of the UAE Vision 2021 and uses it to serve all the sectors in the country. With its international commitments to the Sustainable Development Goals and WSIS Action Lines, the UAE is at the forefront of using ICT for its progress. While the country set for itself higher goals with respect to technology-driven progress in various streams, such as launching the Emirates Mars Mission, setting up Home for Gender Balance, Sustainability and Greenery, Happiness as an Ultimate Goal, Hub for Renewable Energy, using Artificial Intelligence for Life, and achieving Smart Government, etc., it is really in the development and use of latest digital technologies where the UAE occupies one of the most significant places in the world.

IMT-2020, also known as the 5G (Fifth generation), is the next technological revolution in the UAE's mobile broadband. In line with the vision of the UAE 2021, the Telecommunications Regulatory Authority (TRA) is driving the UAE's 5G evolution in the country -- outcomes of these efforts by the TRA appear to be on the horizon as the TRA is working with all strategic partners to make the UAE a pioneer in commercially deploying 5G.

In these 5G developmental efforts, leading market players such as Etisalat and du have a tremendous role to play. Etisalat, which -- as one of the most valued brands within the MEA region, with over 70% total value share in the UAE, and after having completed a massive network modernization program covering network virtualization, spectrum re-farming, single RAN and switching off some legacy fixed network components -- envisions 5G as a game changer with rich potential; a revolution that would elevate services, performance and service enablement. The scale and scope of Etisalat's developmental efforts and network infrastructure existence, in particular, is in line with UAE's digital vision and socio-economic aspirations, market trends in digital transformation, and the region's digital economic development drive.

Since 2016, when the UAE was ranked # 1 for the highest Fibre to the Home (FTTH) penetration in the world, Etisalat has continued to move forward. At that time, at least AED 31 billion were invested by Etisalat alone in line with the government strategy investing more than AED 31 billion in the network infrastructure. This has led to the launch of innovative services meeting the growing demand and changing requirements of our customers across the country and making the capital, Abu Dhabi, the first city globally to be covered with a fibre-optic network. With network enhancement and expansion, Etisalat has also focused on investing in innovation and next-generation technologies and services.

The other leading operator, du, has also prepared well for 5G and has shown its "path to 5G" to successfully support launching 5G services in 2019.

Etisalat-led 5G Development Efforts

There are specific reasons why SAMENA Council feels 5G will materialize in the UAE faster than in any other economy within the SAMENA region. This, to a great extent, can be attributed to Etisalat's infrastructure and development work done and achievements to date:

- The UAE, as well as the region, has experienced the first launch of the first 5G Ultra Mobile broadband experience.
- Pre-commercial 5G network has been deployed in Abu Dhabi and Dubai.
- State-of-the-art 5G services have been demonstrated using an advanced 5G based drone that is equipped with 360 degree Virtual Reality (VR) camera with 4K streaming experience in live

Etisalat, which - as one of the most valued brands within the MEA region, with over 70% total value share in the UAE, and after having completed a massive network modernization program covering network virtualization, spectrum re-farming, single RAN and switching off some legacy fixed network components - envisions 5G as a game changer with rich potential...

environment achieving up to 5Gbps in downlink and 2Gbps in Uplink with extremely low latency (20 times faster than 4G).

- A new 5G triple-play wireless access service (Data, Voice and TV) is experienced using a unique compact 5G Customer Premises Equipment (CPE) device. This advanced 5G deployment will create new business opportunities for Etisalat partners including Intelligent Transport System (ITS), autonomous car, smart health and education.

This 5G readiness supports the UAE's reputation as a country that leads in innovation, infrastructure and development...

- As a key component of Expo 2020 "Smart Site", the Etisalat's PoPs will support an extensive virtualized network, deploying the most advanced and resilient systems and including a central telecom hub supporting requirements of the Dubai South community after Expo 2020. These points will also support all telecom services, namely fixed, mobile, Wi-Fi and IPTV services, and provide millions of visitors with an advanced connectivity experience at Expo 2020.
- Etisalat has made significant achievements on the network, especially in 5G, where it has achieved regional firsts, with the announcement of the first 5G network in the MENA region, and 'Expo 2020' as the first major commercial 5G customer in the Middle East - Africa - South Asia (MEASA) region.
- Expo 2020 Dubai is the first commercial customer to provision and access 5G services in the MEASA region, thanks to its partnership with Etisalat. The Expo 5G network will provide the most advanced digital and telecom services to Expo 2020's millions of visitors, including supporting an expected 300,000 users on peak days. It also means Expo 2020's visitors, participants and partners will enjoy exceptionally high data download speeds with ultra-low latency, both of which far exceed the current 4G.
- This 5G readiness supports the UAE's reputation as a country that leads in innovation, infrastructure and development. The 5G network from Etisalat supports Expo 2020's goal of showcasing the UAE as one of the most connected places on Earth, both physically and virtually.
- Etisalat is developing its fixed and mobile networks in preparation towards the 5G ecosystem development, to support the initial 5G deployment phases. The 5G New Radio Access Technology (NR) will be anchored through LTE network utilizing the LTE virtualized core infrastructure, which will be upgraded in phases to provide the customer with 5G experience until the full transformation to the new 5G core network.
- Etisalat has made PoCs and trials to test various 5G NR capabilities including Massive MIMO with up to 64T64R and high channel bandwidth ranging from 100MHz (in C-band) and 2GHz (in mMW bands).
- Etisalat has already developed its capabilities to provide E2E IoT managed services ranging from connectivity of various IoT use cases and verticals as well as the data and service management though the deployed IoT platforms and the IoT Network Operation Centers (NOC).
- Etisalat has been developing reliable and agile infrastructure to support 5G and IoT services through virtualized platforms including:
- Implementing Cloud native architecture, Cloud-RAN and Mobile Edge Computing
- Migrating Mobile Broadband to Virtualized core (vEPC) to prepare for 5G architecture. .
- Introducing CUPS architecture (Control User Plan separation), to align with 5G architecture, including both NSA & SA, giving flexibility for user plan to prepare for MEC, and slicing concept.
- Building advanced cloud infrastructure aligned with standards and securing agility to serve different functions with scale in / out concept, ready to be evoluted to containers, and micro services concept.
- Serving Mobile broadband on virtual EPC, and then transforming the architecture into CUPS (Control User plan separation), to provide flexibility of user plan distribution.
- The LTE Advanced network features, such as carrier aggregation and high order MIMO, are deployed, which are essential, considering that the initial 5G NR deployment will be anchored through LTE network by utilizing the LTE virtualized core infrastructure which will be upgraded in phases to provide the customer with 5G experience until full transformation to the new 5G core network.
- Massive MIMO with beam-forming capabilities have been tested on live network.
- Etisalat has made PoCs and trials to test various 5G NR capabilities and advanced features including Massive MIMO with up to 64T64R along with beamforming and beam steering capabilities, and high channel bandwidth ranging from 100MHz/200MHz (in C-band) and 2GHz (in MMW bands). Cell throughput of up to 71GHz could be achieved.

Etisalat's Achievements

- Ground-breaking Etisalat agreement announcement with Huawei in March 2014 to establish 5G in UAE
- Etisalat's Live trails at GITEX 2016 (achieving speeds of 36Gbps)
- Etisalat in GITEX 2017 achieved fastest 5G live trial reaching 71Gbps
- December 2017, Etisalat had already launched a pre-commercial 5G
- May 2018, Etisalat successfully launched the first commercial 5G C-band wireless network
- Etisalat's First 5G commercial network at Expo 2020 in the MEASA region
- May 2017, Ericsson and Etisalat completed a trial of 5G mobile technology with outdoor mobility
- August 2018, Etisalat conducted a live on-air trial of Massive MIMO technology
- UAE Ranked #1 for the highest Fibre-to-the-Home (FTTH) penetration in the world
- Etisalat demonstrated 5Gbps in downlink and 2Gbps in Uplink with extremely low latency (20 times faster than 4G)
- Expo 2020 "Smart Site" to be provided by Etisalat

- The live demonstration with global technology giants and field tests at GITEX were a significant step in validating the performance of 5G in high frequency bands. It has refreshed Etisalat's understanding of the capabilities of the technology, which Etisalat believes will deliver capacity and connectivity beyond anything imaginable, today.

Anatomy of a Good 5G Plan

The above account of the UAE's readiness for commercial deployment of 5G is further strengthened by a futuristic deployment plan, which includes:

- Preparing the infrastructure to support 5G
- Acquiring license to use the spectrum
- conducting frequency re-farming
- Upgrading the transport network to support 5G
- Introducing cloud infrastructure based on open stack
- Core upgrades - from EPC to v-EPC - to introduce virtualization concept while maintain customers QOE as per defined standards
- Separation for Control and user plan in EPC
- Secure end-to-end infrastructure capabilities to support eMBB-targeted speed for 5G users starting with fixed users.
- Alignment with terminal suppliers for technology roadmap and terminals availability

Facilitating IoT Readiness

Moving from classical Evolved Packet Core (EPC) to Virtual EPC (vEPC) is considered the first step towards 5G and Narrow Band Internet of Things (NB-IoT). In the UAE, Etisalat has implemented the vEPC, which is currently handling live traffic, including mobile broadband services, fixed LTE services, and Voice over Wi-Fi services. Moreover, Etisalat is currently introducing virtual dedicated cores for different services (i.e., network slicing), in addition to building a dedicated core (vCSGN) for NB-IoT.

There is a lot of effort being put in engaging in work streams with the objective to define 5G use cases applicable for Etisalat customers. 5G use cases will transform industries such as Transport and Automotive, Energy and Utilities, Safety and Security, and will help accelerate digitization.

SAMENA Council aims to support regulators in their efforts toward accelerating 5G efforts, and anticipates an early launch of 5G in the UAE...

5G use cases will also shape consumers' way of living through wearables, sensors and connected gadgets in their day to day activities. We have already seen strong signs of demand from consumers across the globe for AR/VR (Augmented and Virtual Reality) and 4K video streaming. 5G will be the enabler and booster of proliferation of these technologies.

MOVING FORWARD

Operators in the UAE, and in other markets in the region, have recognized the extent of opportunity that digital services, which will be brought forth through 5G, represent. Thus operators are finding it necessary to timely create and offer digital services in a number of areas and countries. This points to the fact that operators require capturing value from digital at the scale and speed of digital ecosystem disruptors. 5G, inarguably, will bring a myriad of new possibilities to the market (and to the regional economy), but it will require adaptation and enablement from multiple dimensions. That is, depending on the extent and state of legal and regulatory frameworks in place, access to and affordability of infrastructure and end-user equipment and devices, technologies available, the prevalent economic system, the existence and size of advertising markets, consumer spent, the existence of an e-commerce electronic payment system, the maturity and sustainability of content ecosystems, as well as the state and competitive dynamics of the digital ecosystem itself, have to be made possible.

The telecommunication community, including Operator, Regulators, and Technology Providers, as a whole, needs to unify around a common technology standard and seek to agree on a set of harmonized spectrum bands; on understanding the deployment needs and mechanics of establishing small-cell (densified) infrastructure; cloudification, NFV, SDN, AI, IoT networks, and a host of other 5G-associated technologies. In the wake of 5G deployment, digital communications regulatory frameworks should undergo an overhaul, and needs of telecom operators with respect to cyber-security laws, cross-border data management and privacy regulation, tariffs and industry fees, and competition should be addressed.

Operators believe that if they could roll out services faster with pro-investment policies, this will help develop the digital economy, bringing value to all stakeholders – customers, governments, operators and investors. In support of this, SAMENA Council's study on 5G spectrum availability has assisted the TRA-led work on assessing benchmarks, especially on how well various countries are doing with respect to preparing for 5G development. Some of the most proactive work has been initiated by TRA-UAE and CITC-KSA.

SAMENA Council aims to support regulators in their efforts toward accelerating 5G efforts, and anticipates an early launch of 5G in the UAE.

SAMENA COUNCIL ACTIVITY

CEO of SAMENA Council Participates in the 4th Meeting of ITU's m-Powering Development Advisory Board

SAMENA Telecommunications Council's CEO, Mr. Bocar BA, participated in the 4th meeting of the m-Powering Initiative Advisory Board, during which the final report of the m-Powering Development Advisory Board on m-Powering Development: turning opportunities into reality was approved for launch. The m-Powering Development Initiative, launched in 2012 by Mr. Brahima Sanou, Director of the ITU Telecommunication Development Bureau, to help create a resource and action plan to deploy ICT services, is designed to create a resource and an action plan to deploy ICT services, from m-Health, m-Learning, m-Governance to m-Commerce and m-Sport. Mr. BA, in his role as chairman of Working Group on Partnerships, presented different types of partnership models generally, and related key success and risk factors, in particular in the context of harnessing ICTs for Development (ICT4D) services. To accelerate the creation of partnerships and maximize their chances of success, a high-level partnership framework and two model Memoranda of Understanding, together with user guidelines were developed by the Working Group as its key outputs. These Model MoUs are intended for use by public sector entities such as government agencies, ministries or regulators that want to partner with a mobile operator and/or a service provider to communicate with the public at large or with a select group of professionals. The MoUs can serve as a starting point for setting out the legal rights and obligations that will govern stakeholder relationships, provide a basis for further discussions among potential partners and help identify touch-points, responsibilities and structures on which multi-stakeholder (or multi-sector) partnerships (MSPs) can be built. Together the framework and memoranda represent a stepping stone to achieving successful partnerships. The Working Group on Partnerships is a sub-group of the m-Powering Development Initiative Advisory Board tasked with developing partnerships to mobilize resources and support the implementation of the m-Powering action plan. The objective of the Working Group is to provide input to the work of the Advisory Board.

Broadband Commission for Sustainable Development Advances Efforts to Connect the World's Nearly Four Billion "Other Half"

Broadband technology is critical to connecting the 3.8 billion people around the globe who still do not have access to the Internet—the world's "other half." This is according to more than 60 participants from United Nations agencies, governments and the broadband industry, who came together in New York City today at the annual fall meeting of the United Nations Broadband Commission for Sustainable Development. The global group of key influencers and decision-makers met parallel to the 73rd Session of the General Assembly of the United Nations also taking place in New York City.

Connecting the "other half" of the world was a resounding call to action echoed by participants, including the Co-Chairs and Co-Vice Chairs of the Broadband Commission.

H.E. President Paul Kagame, President of the Republic of Rwanda, and Co-Chair of the Broadband Commission said: "We are preparing to mark a new milestone where half of the world's people are accessing the Internet. While this growth is not spread evenly across the world's regions, it is nonetheless an encouraging development. With more people online, we need to think through how everyone can access the digital content safely and fairly. To take full advantage of the latest technological innovations, we have to adapt rapidly, including more innovative approaches to policy and regulation. The best way to handle this is through close collaboration among the key stakeholders, from government, the private sector, and the research community."

Mr Carlos Slim, President of the Carlos Slim Foundation, América Móvil and Co-Chair of the Broadband Commission, said: "Broadband is transforming all sectors and activities of our society. But many rural areas are still not connected to the Internet. Governments and regulators need to make universal connectivity a main priority for sustainable development."

Mr Houlin Zhao, Secretary-General of the International Telecommunication Union (ITU), who serves as Co-Vice Chair of the Broadband Commission said: "I am pleased to say that the Commission goes from strength to strength. This year saw the launch of our updated global broadband targets to bring online the world's 3.8 billion people currently not connected to the Internet, at the Special Session in Davos in January attended by many of you, as well as Heads of UN agencies and industry CEOs. The Commission's targets track some of the most important policy priorities in broadband, and will play an important role in achieving the UN Sustainable Development Goals."

Ms Audrey Azoulay, Director-General of the United Nations Educational, Scientific and Cultural Organization (UNESCO), who serves as Co-Vice Chair of the Broadband Commission said: "We are reaching an important milestone with half of the population online. But advantages of internet access are not shared equally. Access to Internet is not enough in itself to improve livelihoods. We must put emphasis on digital skills and knowledge"

Mr Houlin Zhao welcomed several new Commissioners at the meeting including:

- Mr Bocar Ba, Chief Executive Officer, SAMENA Telecommunications Council
- Mr Marcin Cichy, President, Office of Electronic Communications, Poland
- Ms Kristalina Georgieva, Chief Executive Officer, World Bank
- Dr Hessa Al Jaber, Chairperson, Qatar Satellite Company
- Mr Rob Shuter, Group Chief Executive Officer and President, MTN Group Ltd.
- Mr Hans Vestberg, Chief Executive Officer, Verizon Communications

The meeting comprised two substantive sessions examining the 50/50 moment of half the world being online and the changing face of information and communication technologies regulation.

Three Working Groups of the Broadband Commission presented reports at the meeting:

The Working Group on Digital Entrepreneurship, chaired by Andrus Ansip, Vice-President of the European Commission and Commissioner on the UN Broadband Commission for Sustainable Development, has released the report Digital Entrepreneurship, which looks at the challenges and opportunities for using digital entrepreneurship to achieve the 17 Sustainable Development Goals. Drawing on a wealth of desk research, internal

debate and broad stakeholder input, the report describes "entrepreneurship" and "entrepreneurial ecosystems" as four wheels that must be set in motion: 1) infrastructure and macro-economic fundamentals; 2) policy support; 3) e-Commerce; and 4) governance. The study sets out a nine-point roadmap with targets and points of reflection for increasing the spread, reach and effectiveness of digital entrepreneurship to deliver lives that are healthier, wealthier, longer and more peaceful.

The Working Group on Digital Health, co-chaired by The Novartis Foundation and Intel Corporation, has launched the report The Promise of Digital Health: Addressing Noncommunicable Diseases to Accelerate Universal Health Coverage in Low- and Middle-Income Countries. The report provides practical recommendations and best practice examples for how policy-makers can use readily available digital technologies to address noncommunicable diseases (NCDs) such as heart and lung disease, cancer and diabetes. According to the World Health Organization, NCDs killed 41 million people in 2016, particularly in low- and middle-income countries. The report highlights that properly addressing NCDs is essential to achieve Universal Health Coverage, which means all people receive the health services they need without suffering financial hardship.

The Working Group on Epidemic Preparedness, chaired by KT Corporation, has launched the new report Preventing the Spread of Epidemics using ICT. The report provides practical recommendations and best practice examples for how policy-makers can use readily available and innovative ICTs to prevent the spread of epidemics such as SARS, MERS and Ebola. Numerous cases of fatal outbreaks of epidemics have massively and negatively affected humanity and the global economy, resulting in high health risks and economic losses. Properly and securely utilizing data, establishing an integrated global epidemics monitoring ICT platform, and expanding global governance are essential to help prevent the spread of epidemics effectively.

In addition, new Working Groups were proposed.

Mats Granryd, Director General of GSMA, presented the annual update of the Broadband Commission Working Group on Bridging the Digital Gender Divide commitments made by its members. From now on, these updates will be the responsibility of the Equals Global Partnership.

The Broadband Commission welcomed the participation of Ambassador Amandeep Singh Gill, Executive Director of the Secretariat of the United Nations Secretary-General's High-level Panel on Digital Cooperation, and looks forward to further collaboration with the Panel Members.

Prior to this annual meeting, the Commission issued the 2018 edition of its flagship State of Broadband report on 11 September, a unique global snapshot of broadband network access and affordability, with country-by-country data for over 160 economies worldwide measuring broadband access against key sustainable development targets set by the Commission. This year's report shows that more and more governments now benchmark broadband status in their national plans; and for the first time, the report shows that at least 15 countries now have strategies in place for promoting the safe use of artificial intelligence.

BT Joins Leading Regional Operators as a SAMENA Council Member to Focus on Regional Digital Development

SAMENA Council has announced that BT (British Telecom), one of the world's leading providers of communications services and solutions, has joined with full membership with the purpose of contributing to the stakeholder dialogue on understanding complexities and challenges of the transforming digital ecosystem in view of Operators' evolving role and central position in the 4th industrial revolution. Expressing his warm welcome to BT for having joined SAMENA Council's community of largest telecom operators in the region, Mr. Bocar BA, CEO & Board Member stated, "BT is one of the world's leading providers of communications services and solutions, serving customers in 180 countries. Its principal activities include the provision of networked IT services globally; local, national and international telecommunications services to its customers for use at home, at work and on the move; broadband, TV and internet products and services; and converged fixed-mobile products and services. BT also provides network services to other licensed operators, and its research labs have been playing a leading role in the development of global communications standards and services. With such a diversified operations as well as service and solutions profile, BT can help define a new generation of digital services within the SAMENA region and can benefit from SAMENA Council's operator members' collective strength on both policy advocacy and on pioneering innovation as the data-driven digital communications landscape undergoes transformation." Mr. Eyad Shihabi, Vice President, Middle East, Africa, and Turkey at BT speaking on the new partnership stated, "We are extremely proud and excited about our presence in SAMENA Council, and we look forward to working closely with the body and our peers in guiding

our region towards a technology-enabled, digitally-transformed future. Technology and connectivity provide a platform for achieving measurable and impactful socio-economic development, and our focus will be on bringing our global expertise to bear within a regional context." BT's participation as an important part of SAMENA Council's membership can help create new synergies among Telecom Operators on multiple challenge areas, including 5G development and deployment scenarios, cross-border data flows, development of digital economy, while creating means and tools for introducing a myriad of AI-driven solutions in the age of IoT. The digital ecosystem's sustainability challenges and the need for making better use of digital technologies demand that Telecom Operators operating within the SAMENA region collectively communicate on common issues and needs, while providing SAMENA Council the opportunity to provide advocacy support and build communication bridges with regional Regulators on behalf of Operators. SAMENA Council believes policies and co-operative approaches can help develop new methods and models of engagement, help frame future-friendly regulations and policies, and cross-stakeholder involvement should be fostered to incentivize and influence more investment in digital development. New members, including both Telecom Operators and Technology Providers, 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 toward addressing digital development matters that will define the future of the industry.

Bubbletone First Member of SAMENA Council with Dedicated Focus on Blockchain Development

SAMENA Telecommunications Council has announced that Bubbletone, a wholly-owned brand of Clementvale, has joined its membership with the purpose of contributing to building the blockchain ecosystem in the South Asia - Middle East - North Africa region. Both SAMENA Council, as an operator interest and advocacy industry body and Bubbletone, as an emerging leader in blockchain technology, especially targeting an improved cross-border communication experience for telecom operators' customers, view the need for digital transformation and value-creation in this age of digital economy through blockchain among elemental steps toward equipping telecom operators to enhance their customers' digital experience and revenues.

Mr. Bocar BA, CEO and Board Member of SAMENA Council, welcoming Mr. Yuri Morozov, CEO and Mr. Oleg Pravdin, CTO, and congratulating Bubbletone on being the first member of the Council, wholly dedicated to developing blockchain among telecom operators, stated: "Our Industry today has the most complex operations framework, with latest technologies and new stakeholders in the digital ecosystem emerging at a fast pace. There exists much room for efficiency, secure and cost-effective communication for end-users, and reliable partnerships among telecom operators and new-generation digital service providers. As Bubbletone focuses on blockchain development and is starting its business operations by offering roaming-centric solutions and by bringing together mobile service providers, specialized service companies and users of mobile devices, who will be able to enjoy top-quality communications at reasonable prices, SAMENA Council feels an utterly new genre of communications services is being created. The efficiency and secure identification that Bubbletone's blockchain solutions make so easy to achieve through blockchain, have tremendous potential for growth and adoption among operators of the SAMENA region."

"We are very glad to become a member of one of the foremost telecommunications association that cherishes innovation and creates necessary conditions for bringing this innovation into the telecom industry. Our mission is to implement blockchain technology in the telecom and develop its standards for the industry players. Thanks to our membership, we will be able to provide operators from South Asia, Middle East, and North Africa with an opportunity to fully enjoy benefits that blockchain brings — secure and direct interaction that results in new clients and revenue growth", said Yuri Morozov, CEO and Founder of Bubbletone Blockchain for Telecom.

MEMBERS NEWS

STC Establishes a Platform to Share Cyber Threats Information in Collaboration with Anomali

STC has signed an agreement with Anomali Company to establish a platform for cyber threats information sharing. The agreement focuses on enhancing the methods of dealing with cyber threats in STC group and its subsidiaries. The agreement also, enables the group to use the latest technologies in cybersecurity, analyze data (cyber), predict and deal with them before they occur by supporting security threat monitoring experts at the cyber defense centers with high-quality information on sources of threats and cyber-attacks, which will provide STC with early alarm system for any possible attacks on its infrastructure. After the signing, Eng. Yasser Alswailem, Cybersecurity GM stated that " our aim is to continue enhancing Cybersecurity for the infrastructure of STC group to protect customers data through the bilateral agreements with specialized companies in analyzing cyber data to provide information of cyber threats via interactive platforms in the right time.

Batelco Signs Agreement with the Supreme Council of Health

Batelco, the leading digital solutions provider in the Kingdom of Bahrain, and the Supreme Council of Health (SCH) have signed an agreement on Sunday 2nd of September 2018 in support of the National Health Insurance Program (Sehati). The signing ceremony took place at the SCH headquarters in the Bahrain Financial Harbor. The agreement was signed by Batelco Chairman Shaikh Abdulla bin Khalifa Al Khalifa and SCH President Lieutenant General Dr. Shaikh Mohammed bin Abdullah Al Khalifa, in the presence of a number of top officials from both Batelco and the SCH. The joint cooperation aims to strengthen the working relationship between the SCH and Batelco, with the aim of carrying out health related projects. Under this agreement, Batelco will contribute BD850,000 to support the Kingdom's health sector initiative, as well as connect the health authorities with the National Health Insurance Program. Additionally, Batelco will support the SCH in the planning process. Commenting on this agreement, Batelco Chairman Shaikh Abdulla bin Khalifa Al Khalifa said, "Batelco is pleased to work closely with the Supreme Council of Health to determine the optimal method to utilize ICT solutions to strengthen and elevate the Kingdom's health insurance. Batelco aims to bring the latest technologies to the Kingdom's health sector and it is our national and social duty. Our partnership with the Supreme Council of Health has provided us with this opportunity and Batelco will focus its efforts on providing the required support to uplift and enhance the Kingdom's health sector." SCH President Lieutenant General Dr. Shaikh Mohammed bin Abdullah Al Khalifa commented, "I would like to extend my appreciation to Batelco's generous contribution and their continuous support to the transformation of the Kingdom's health sector. We are proud to work with Batelco and their provision of advanced solutions and advisory is a step forward to achieving the National Health Insurance Program." Batelco will also work closely with the Supreme Council of Health to develop a system in which hospital and health center records are connected, allowing patients' flexibility on choosing a hospital or health center within the National Health Insurance Program. Batelco will also contribute by offering solutions that link medical files and systems between the Kingdom's various health centers and hospitals, which will support the health sector in revolutionizing the sector through better utilizing the available resources while overcoming pressing challenges.

Batelco will Provide Cutting-Edge ICT Solutions, Including the Most Advanced Network, Digital Solutions, Security Solutions, WIFI and Mall Management Solutions

Batelco, the leading digital solutions provider in the Kingdom of Bahrain has signed a partnership agreement with Dilmunia Mall Development Company. Batelco was appointed by Dilmunia Mall Development Company to provide integrated ICT solutions for the Mall of Dilmunia. The agreement was signed by Batelco Bahrain Chief Executive Officer Mr. Mohamed Bubashait and Dilmunia Mall Development Company Chairman Shaikh Khalid bin Mohamed-Al Khalifa at the Dilmunia Mall Development Company headquarters in the presence of officials from both companies. Under this agreement, Batelco will provide cutting-edge ICT solutions, including the most advanced network, digital solutions, security solutions, WIFI and mall management solutions. Batelco Bahrain CEO Mohamed Bubashait said that Batelco is proud of this partnership, which is in line with the company's commitment to provide unmatched digital solutions, as well as Batelco's strategic mission to support the growth of various sectors and projects in the Kingdom, which ultimately supports the Kingdom's national economy. "Over the years, Batelco has successfully established solid working relationships with a number of leading companies in the Kingdom and has always been and continues to be keen on providing the best products and services that meet customer expectations," added Mr. Bubashait. Commenting on this occasion, Dilmunia Mall Development Company Chairman Shaikh Khalid bin Mohamed-Al Khalifa said, "We as the management of the mall have endeavored to provide solutions that meet the technological advancement in the market." Batelco has established a strong reputation as a local, regional and global telecom player due to the company's ability to meet the requirements of the ICT sector, as well as position itself as the preferred ICT and digital solutions provider to a number of the Kingdom's major real estate development projects. Batelco has played a key role in enhancing the Kingdom's position as a telecommunications hub in the region and is recognized today as Bahrain's leading digital solutions provider. Batelco continues to shape the ICT sector both locally and regionally. Mall of Dilmunia is a project by Dilmunia Mall Development Company that represents a balanced modernistic and futuristic architecture, which creates an exciting family oriented universe. The mall will provide fun and educational entertainment facilities for children and families. The mall will overlook a lush garden landscape, a spectacular two-story high cylindrical aquarium and a state-of-the-art indoor Ice Rink. Mall of Dilmunia aims to redefine the Kingdom's shopping experience.

Alfa Launches Voice over LTE for the First Time in Lebanon

Under the auspices of H.E. the Minister of Telecommunications, Jamal Jarrah, Alfa, managed by Orascom TMT, launched for the first time in Lebanon the Voice over LTE technology from the Alfa flagship store located in its headquarters in Dekwaneh. In his Speech, Chairman and CEO of Alfa, Marwan Hayek said: "We proudly meet altogether today in a historic moment, the third in the history of the mobile industry in Lebanon. The first being in 1994, a day that Lebanon witnessed the first 2G voice call on the Alfa network and the second was in 2011 when the Lebanese witnessed the first 3G call on Alfa's network (data and voice). Today, this milestone, in collaboration with Ericsson, marks the first voice call over Alfa's 4G network (VoLTE)." Mr. Hayek also pointed out that in 2013, Alfa was the first operator to launch 4G data in Lebanon, and back then, Alfa also accomplished the first virtual VoLTE call. Today, our network is fully-ready both commercially and technically to launch the service, and Alfa will soon start rolling out the service to its users gradually while keeping pace with all new mobile technologies emerging, all the while keeping in mind that handsets supporting this service are not yet widely available locally and globally. He added: this exceptional event is the final stop in our move from a traditional to a digital service operator or as it is called here at Alfa, the Happiness Provider. Hayek explained that the VoLTE service provides its users with 2 main advantages:

- A staggering Call Setup Time of 1 to 2 seconds compared to a 7-10 second span on regular 2G or 3G calls.
- High Definition Sound Quality.

Minister Jarrah praised the remarkable contributions of Alfa to modernize the network as well as the services it provides, through which it is keeping up swiftly with all developments happening globally in the telecommunications industry. All of this is happening so we can work together to bring Lebanon back to its previous pioneering position in the Industry so that it becomes a model of progress in line with our aspirations for the sector. He added: This development requires a lot of effort and time; but despite our modest potential, we have no choice but to catch up with the technologically advanced neighboring countries. Our efforts are being translated in network modernization as well as provision of reasonably priced services for the Lebanese people. This is evident, and Alfa is working relentlessly in this regards through the VoLTE service as well as providing better bundle prices in line with its user's needs. Minister Jarrah congratulated Alfa and Mr. Hayek on this project, which is considered a new achievement for Alfa and the telecommunications sector. He commended the great and continuous effort, which reflects positively on the image of Alfa and the telecommunications sector in general. Minister Jarrah and Mr. Hayek then made the first VoLTE phone call in Lebanon through Alfa's network.

du Inks Pact With ADGM to Support Digital Transformation Agenda

du, from Emirates Integrated Telecommunications Company (EITC) has announced a new partnership with the Abu Dhabi Global Market (ADGM), the international financial center based in Abu Dhabi, to facilitate its digital transformation agenda. The Memorandum of Understanding (MoU) was signed by Khalid Al Suwaidi, Chief Operating Officer of ADGM and Osman Sultan, Chief Executive Officer of EITC, and witnessed by His Excellency Ahmed Al Sayegh, Chairman at ADGM and His Excellency Mohamed Al Hussaini, Chairman at EITC The MoU sets a formal framework for du to work with ADGM in exploring and developing technology infrastructure, innovation platforms, potential business opportunities, digital services, pilot projects, among others within ADGM and Abu Dhabi. Osman Sultan, Chief Executive Officer at EITC, said: "The strategic alliance with Abu Dhabi Global Market is a reflection of the confidence and trust reposed in brand du, in undertaking the digital and ICT transformation agenda. The mandate, will provide du the opportunity to collaborate in the development of bespoke mission critical solutions and innovative experiential services that will propel ADGM with a defining competitive digital advantage. Khalid Al Suwaidi, Chief Operating Officer at ADGM said: "We are pleased to enter a new partnership with du to jointly explore and review transformational initiatives that offer bespoke solutions and innovative services to better service ADGM, its community of business and entities on Al Maryah Island. I look forward to working with du and its team to enhance the communications and information technology offerings that will support ADGM in its role as an international financial center and global business hub." du is committed to partnering with UAE businesses as a preferred partner of choice to deliver end-to-end bespoke ICT solutions and become a driving force behind the resilient and sustainable digital transformation for enterprise customers.

Etisalat Teams up with eSolutions to Enhance Product Offerings

Etisalat Facilities Management, a subsidiary of Etisalat Service Holdings, has signed an agreement with established market leader eSolutions, part of Midis Group and a regional platinum partner of IBM, to jointly offer Smart Integrated Facility Management solutions to achieve cost savings, operational efficiency and customer satisfaction. The MoU was signed between Ali Hassan Harmoodi, General Manager, Etisalat Facilities Management (eFM); and Gaby Matar, Group Managing Partner, eSolutions, on the sidelines of the FM EXPO held from 23rd to 25th September at the Dubai World Trade Center. eFM is one of the main exhibitors at FM EXPO, the Middle East's premier event for the facilities management industry. By partnering with eSolutions, eFM will be able to enhance its operations by utilizing IBM cloud-based solutions in areas of facility management, space management and workforce management while optimizing related operational expenses. eSolutions will empower eFM to integrate IBM latest technologies and systems and create the required use cases to benefit eFM clients. Ali Hassan Harmoodi, General Manager, eFM, said: "The facility management industry is going through a major transformation, which is reshaping its requirements and priorities, mainly driven by the technology advancement and the tendency to outsource the FM functions to an integrated facility management provider. "We, at eFM, are pleased to partner with industry leaders to develop breakthrough services by utilizing technology advancement, innovative services and integration opportunities to achieve cost savings and operational efficiency while keeping the end-user perspective at the core of the facility management offerings." Gaby Matar, Group Managing Partner, eSolutions, said: "We are extremely excited about this partnership with eFM and look forward to servicing their clients with our successful IBM Platinum Partner portfolio of MAXIMO, leveraging today's best technology in our rapidly changing world. Together with a highly skilled team of professionals, we will deliver quality enterprise solutions that match the highest international standards reducing costs, maximizing production uptime and enabling smart decisions." At FM EXPO, eFM and Etisalat Digital are showcasing the latest technology and innovation on the facility management industry utilizing IoT platforms and cloud-based solutions. Both are developing smart digital interactive systems to remotely monitor and control the built-space, and utilize the Internet of Things eco-system and analytical platforms to enhance energy saving, reduce the utilities consumption and optimize the operational efficiency.

Etisalat Roaming Packages Offer Business Customers Coverage across All In-Flight Networks

Etisalat announced that subscribers of any Global Business Roaming pack can now enjoy in-flight coverage in all airlines that provide on-board connectivity at no extra cost. Etisalat Global Business Roaming packages – both data and voice – will now include both Aeromobile and SITAOnAir in-flight coverage, providing business users increased options and uncompromised connectivity when they are airborne. All roaming packages shall remain the same for all subscribers with the ability to use in-flight roaming at no extra charge. Currently, Etisalat's roaming network covers 190 global destinations. Salvador Anglada, Chief Business Officer, Etisalat, said: "This exclusive proposition is in line with Etisalat's commitment to offer innovative and convenient communication services to our roaming business users. We recognize that the majority of business travelers need to remain connected and productive on-the-go, including roaming while on board a flight. "With Aeromobile and SITAOnAir as our partners, we are now able to provide expanded coverage across all airlines with on-boarding connectivity, allowing our subscribers to stay online, make and receive calls, check social media, and more during flights at no extra cost using Etisalat's Global Business Roaming packs."

Etisalat Digital Signs Cloud Hosting Deal with Massar Solutions

Etisalat Digital announced that Massar Solutions, a UAE-based fleet management firm, has signed up for its secure and reliable OneCloud Services. Etisalat OneCloud offers a convenient on-demand subscription to a pool of configurable shared and dedicated multi-tenant computing resources. This end-to-end managed cloud solution includes infrastructure-as-a-service, managed security services, managed backup, managed applications and managed disaster recovery services. Fahim Mohamed Al Shehhi, Managing Director, Massar Solutions P.J.S.C. said: "Outsourcing of private cloud hosting functions will provide significant value to Massar Solutions in the long term by helping the organization reduce operational expenses, maintain our competitive position and more importantly, improve efficiency, transparency and resilience through new technology." Miguel Angel Villalonga, Vice President Cloud & Data Center Etisalat Digital, said: "We are pleased to offer Etisalat's OneCloud Services that cater to the growing needs of enterprise customers like Massar, a leading fleet management firm that provides innovative and comprehensive mobility solutions to its clients in the government, semi-government and the private 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. We recognize that these organizations want to leverage on cloud's ever-expandable and always available infrastructure to speed up the delivery and reliability of new

and existing applications." As part of the agreement, "Etisalat" will host Massar's fleet management application on its cloud in the UAE. The agreement will help Massar stay ahead of the curve with access to "etisalat's" expertise, which ensures adherence to industry standards and policies in maintaining this infrastructure.

Omantel Hosts Major Investor Conference

Omantel, the leading provider of integrated telecommunications services in the Sultanate, hosted an investor conference recently with the objective of discussing the company's business prospects with investor communities. The Omantel Investor Conference, organized in cooperation with Gulf Baader Capital Markets (GBCM), was in, Al Mouj Muscat. In his presentation to the investors, the Omantel chief executive highlighted the company's future strategy to create growth opportunities and deal with the changing and challenging telecom environment, in addition to updates on the recent acquisition of a strategic stake in Zain Group and the underlying potential commercial and

operational synergies opportunities between the two operators. The Omantel CEO updated the audience on the steps taken by Omantel to maintain its leadership and create long-term value for its shareholders. The event was also a platform for networking, innovation showcasing and knowledge sharing. Talal Said Marhoon Al Mamari, CEO of Omantel, said, "We were pleased to host this investor conference. The purpose of the meeting was to deliberate on the company's business prospects with investor communities. We were able to showcase Omantel's market characteristics and growth opportunities, as well as sector updates." "The conference provided an effective engagement with key stakeholders, especially on the post-acquisition of Zain Group and how it is transforming Omantel from a single country incumbent into a major Middle East and North Africa (Mena) operator," he added. "During the meet, we were able to outline the company's various on-going strategic and operational plans and recent Omantel initiatives to diversify its revenue such as the Zain acquisition, establishment of a dedicated information and communication technology (ICT) unit to capitalize on the available business opportunities, in addition to the expansion of the Omantel wholesale and international businesses," he said. "Omantel made investments in areas that have growth potential, where we have strategic advantages that will allow us to excel, take for instance, the investments in the submarine cable systems. With active participation from the conference attendees, the investor conference produced unique insights into the opportunities

and challenges. Omantel will continue to empower the digital society to flourish, allowing new ways of doing business and delivering an enhanced customer experience, leveraging on Zain expertise in these areas," he added. The conference began with a presentation on Omantel's growth through international mergers and acquisitions (M&A) to safeguard and enhance long-term shareholder value. The presentation highlighted Omantel's recent acquisition of Zain shares, bringing control to the Zain group. Elucidating how the Zain association is impacting overall business, the presentation illustrated how the transformational transaction propelled Omantel and Zain into a new era, bringing together a unique portfolio of leading telecom operations with balanced features between profitability and growth potential. The transaction is expected to bring together economies of scale and sizable synergies, making the new group more agile and efficient. The second session of the conference included a presentation on sector challenges and opportunities. The presentation evaluated how Omani telecom market dynamics were changing substantially, with core telecom markets gradually saturating and competitive pressure increasing. The session reiterated the need for Omantel to boldly react to the market dynamics to safeguard its position and grab growing opportunities, encapsulated in the Omantel Corporate Strategy 3.0. The session also highlighted the way in which Oman has become a key regional hub with access to 20 submarine cable systems, which supported Omantel to grow revenues despite increasing competition in the domestic market. It revealed how Omantel successfully used its cable landing stations to transform Oman into a major regional content hub supporting over 40 operators in the region and beyond. The session concluded, emphasizing the importance of the international diversification and various initiatives by the management to create and sustain the foundation for long-term shareholder value. The conference concluded by emphasizing the need for Omantel to diversify revenue streams through international investment and to implement the initiatives proposed by the management to create and sustain long-term shareholder value, taking into consideration the current economic environment that offers better growth potential for large entities with expanded and diversified geographical operations.

Telecom Egypt's BoD Approves the Acquisition of 50% of Egyptian International Submarine Cable Co.

Telecom Egypt announces that its board of directors has approved the acquisition of 50% of its subsidiary Egyptian International Submarine Cable Company "EISCC" at a value of USD 15mn. On 17 September 2018, Telecom Egypt had announced that EISCC had completed the acquisition of Middle East and North Africa Submarine Cable "MENA Cable" from Orascom Investment Holding "OIH" at a total enterprise value of USD 90mn. Earlier in August, Telecom Egypt had also announced the signature of a Memorandum of Understanding (MoU) with Bharti Airtel, according to which Telecom Egypt will bundle assets of its international submarine network with assets on MENA Cable. The deal, which is expected to be concluded soon, will enable Telecom Egypt to recover its entire investment in MENA Cable. The BoD's decision to acquire the remainder of EISCC has multiple financial advantages including: - Full consolidation of MENA Cable profitability from the Bharti Airtel transaction

- Immediate savings of cUSD 10mn as a result of the new structure
- Total recognition of recurring revenue over the life time of the cable (min. of 15 years)

Ahmed El Beheiry, Managing Director and Chief Executive Officer, commented: "Management has worked tirelessly since the beginning of the year to secure the revenue of its international submarine cable network and had announced to investors that it foresees a short-term return on the acquisition of MENA Cable. We have since reported several milestones in our plan including the conclusion of the acquisition of MENA Cable as well as the signing of a MOU to recover our investment. Today's announcement is very important as it will enable the full consolidation of the asset and the expected revenue over its lifetime. The completion of today's transaction marks the second fully owned submarine cable by Telecom Egypt in addition to TE North."

Telecom Egypt Concludes the Acquisition of Middle East and North Africa Submarine Cable "MENA"

Telecom Egypt announces the conclusion of the acquisition of Middle East and North Africa Submarine Cable ("MENA Cable") from Orascom Investment Holding "OIH" through its subsidiary Egyptian International Submarine Cable Company "EISCC". As previously announced, the total enterprise value of MENA Cable is USD 90mn of which USD 40mn represents the equity value of MENA Cable and the remainder its outstanding debt. EFG Hermes acted as the brokerage company for executing the transaction on Telecom Egypt's side. Ahmed El Beheiry, Managing Director and Chief Executive Officer, commented: "I am very pleased with the closing of this transaction that will add MENA Cable to our international cables network in line with the company's strategy to expand its international connectivity to enable Egypt's vision of becoming a digital route. The decision to acquire MENA Cable is a result of our vision to achieve a short-term return from this transaction capitalizing on the growing data demand from India. Telecom Egypt had announced in August the signing of a Memorandum of Understanding (MoU) with Airtel, wherein, Telecom Egypt will bundle MENA's assets with existing assets of the TE network. Airtel will be granted IRUs (Indefeasible Right of Use) on MENA Cable and TE North cable systems as well as large capacities on a long-term basis on two new cable systems (SMW5 & AAE1). We expect to formalize the partnership with Airtel into an agreement soon, which will enable Telecom Egypt to recover all of its investment in MENA Cable."

Zainiac Selects Three Initiatives to Incubate Towards Commercialization

Zain Group, the leading mobile telecom innovator in eight markets across the Middle East and Africa, is pleased to announce it is offering full financial and strategic support to three startup initiatives, which have been generated through the company's innovative internal ideas generating e-platform, Zainiac. Zainiac was originated and introduced in late 2017 by Zain Vice-Chairman and Group CEO, Bader Al-Kharafi, to act as an internal e-platform and community for all Zain Group personnel (Zainers) where ideas are shared, and solutions are created aimed at stimulating creativity within the company. The platform allows Zainers across the Group on a bi-annual basis to suggest innovative ideas, share challenges, and collaborate in a bid to achieve common goals. To date more than 300 initiatives and project ideas have been submitted with the main aim of the initiative being to promote internal innovation and motivate Zainers to start new businesses, and hopefully become the next unicorns in our region. The Zainiac platform is an acknowledgement of the huge talent pool assembled within Zain Group, and aims to promote synergies among country operations, leveraging the benefits of crowd-sourcing of new ideas and business models. As part of the initiative, Zain organizes workshops with leading global partners and mentors which focus on establishing and fostering startup competencies. In the first cycle of entrepreneurial ideas submitted to Zainiac, four were short-listed for further development and submitted to Zain Group senior executives to mentor and develop their value proposition and business models. These ideas were then pitched to the Vice-Chairman and Group CEO, and three were green-lit to receive the full support and funding from Zain. Commenting on the selection of the three ideas for commercialization, Bader Al Kharafi said, "This generation of successful innovative ideas will become one of the greatest differentiators between societies that progress into the future. We are very clear in our view that for Zain to remain innovative and competitive, we need to generate ideas from wherever we can find them and seeking them out internally is one of many prudent options we undertake". Furthermore, Al Kharafi added, "We are pleased to have reached this milestone stage in the Zainiac initiative, which gives us a clear indication of the impressive talent and creativity that exists within Zain across our footprint. I would like to thank everyone at Zain for their input into and support of the e-platform as well as for the contribution of ideas, and wholeheartedly congratulate the originators of the three initiatives we are taking forward."

Accenture Launches 5G Acceleration Services at Mobile World Congress Americas

To help accelerate the deployment of 5G network technology, Accenture (NYSE: ACN) has launched a new set of services for communications service providers (CSPs), network operators, device manufacturers and non-traditional mobile network operators – such as multiple-system operators, internet software and platform players and over-the-top content suppliers. Accenture worked closely with leading companies across all areas of the communications industry to define the primary challenges slowing down 5G deployment. The most common of these include: spectrum planning and feasibility, use cases and new business models, device strategy, network deployment management and operational complexity. To help the industry address these challenges, Accenture has created 5G Acceleration Services, which will initially focus on:

- 5G strategy, use cases, and business models
- Device innovation
- Network deployment approach
- Architectural and platform innovation

As part of the initiative, Accenture has created a set of specific capabilities to help deploy 5G successfully. These include, among others:

- 5G Assessment Tool: This tool helps clients score and determine their readiness across all aspects of 5G, including spectrum position in high-, medium- and low-ranges; core business strengths and "DNA"; monetizable use cases and strategy; device partnerships and network deployment capability; and organizational tools and structure.
- Methodology and Business Strategy for 5G Use Cases: Strategic services to help clients create agile business models, form targeted and robust ecosystems, while seeking new capabilities that impact competitive agility.
- Strategy for Device Innovation: Helping to create a 5G post-smartphone device strategy, leveraging Accenture's wireless technology expertise, experience building smartphones and consumer electronics, broad industry partnerships, geographic diversity and experience in embedded software development.
- Network Deployment Acceleration: Helping clients accelerate the execution of their 5G network build and deployment activities by providing an analytics-driven intelligent command center approach and capability to support end-to-end coordination, process and data optimization, partner management, and workforce management.

Network Operation and Maintenance: Helping to create a new operating model to enable the next generation of network architecture evolution while leveraging network vitalization, analytics, automation and artificial intelligence to simplify and streamline operations and activities across the day-to-day management of the network. "More than an incremental step, 5G represents a fundamental transformation of the role that mobile technology can play in society," said Tejas Rao, managing director and global 5G offering lead for Accenture's network practice. "But transforming the networks so that business, the economy and consumers can reap the rewards is no easy feat. While 4G required tens of thousands of macro towers, rolling out 5G will require the deployment of millions of small cells – and therefore a different type of capital outlay for the network providers. That's why we've created the 5G Acceleration Services." "Accenture 5G Acceleration Services provides our clients with a framework and a set of analytics powered tools to help ensure they're making the right investments in the right areas," said Jefferson Wang, managing director, Accenture Strategy, Communications, Media & Technology. "The new services will help clients create their 5G vision and start their journey to make it a reality."

Accenture Top for Quality of Business Strategy Offering in GCC

Accenture has been ranked first across eight key service categories in the Gulf Cooperation Council (GCC) Client Perception Study 2018, surpassing other top consulting firms in the region for the quality of its business strategy offering. Conducted by Source Global Research, the annual survey ranks the region's leading consulting firms based on client perceptions. In addition to ranking the highest in quality of its Business Strategy, Accenture was also recognized as:

1 for Quality of its digital transformation services;
1 for Overall quality of work in the GCC;
1 for Quality of financial management services;
1 for Quality of data & analytics services;
1 for Value, according to respondents in an operations role;
1 for Quality, according to respondents from the services industry; and
1 for Quality, according to respondents in an IT role.

"Digital transformation is a key pillar of Saudi Arabia's Vision 2030, with the government increasingly focusing on innovation and technology to drive growth. We are proud to be supporting the Kingdom's efforts in this space. The survey results reflect our commitment to our clients in providing them with the outmost value and expertise," said Dr. Khaled Al-Dhaher, country managing director for Accenture in Saudi Arabia. "Going forward, our key priority will be to continue to provide transformative business solutions to the nation's leading organizations, both in the private and the public sectors, and help their visionary leaders to create a digitalized diversified economy." For the study, Source Global Research surveyed senior executives, directors and senior managers in the GCC responsible for buying substantial volumes of consulting services in the previous year to gauge how consulting firms stack up against their competitors in the eyes of current and prospective clients. The respondents surveyed represent

a wide range of industries and business functions, with more than two-thirds (68 percent) of them working in organizations that generate more than USD500 million in annual revenue. The study is also based on qualitative research from interviews carried out in 2017 and 2018 with senior buyers of consulting in the GCC. "In recent years, the world has witnessed change at an unprecedented rate," said Alison Huntington, head of client & brand insights at Source Global Research. "As with almost all sectors, this shift has greatly impacted the consulting industry and forced firms to adapt to meet changing customer demands. Companies are increasingly turning to strategy and consulting firms to navigate digital transformation and set up robust business strategies. We would like to congratulate Accenture for claiming the top spot." "As a services business, we're incredibly proud that our clients have recognized our efforts and prefer Accenture across these key categories," said Visar Sala, a managing director at Accenture who leads Accenture Strategy in the Middle East and Turkey. "Receiving such high marks for our work, particularly in business strategy, is truly an honor given the competitive landscape in the region. With many industries heading into uncharted territory, Accenture is helping to shape our clients' growth strategy, combining our deep business insight with the understanding of how technology will impact industry and business models."

Apple Closes Shazam Acquisition

Apple completed a purchase of music recognition app Shazam for an estimated USD400 million and announced plans to make the product available advert-free. The deal was first announced in December 2017, but completion was held up by the European Commission due to concerns it could reduce choice in the music streaming market. The Commission cleared the acquisition earlier this month. In a statement, the tech giant said: "The app will soon offer its experience ad-free for all users so everyone can enjoy the best of Shazam without interruption." It's not clear if Apple will integrate Shazam's core product, but the idea is likely to boost its music streaming service and step up competition with major rivals Google and Spotify (which, along with Snap, was also reportedly interested in buying Shazam). Oliver Schusser, VP of Apple Music said: "With a shared love of music and innovation, we are thrilled to bring our teams together to provide users even more great ways to discover, experience and enjoy music." Apple added Shazam has been downloaded over 1 billion times and is used over 20 million times each day.

Apple Introduces iPhone Xs and iPhone Xs Max

Apple announced iPhone Xs and iPhone Xs Max, the most advanced iPhones ever, taking the vision for the future of the smartphone to a new level. The 5.8-inch iPhone Xs and 6.5-inch iPhone Xs Max feature stunning Super Retina displays, a faster and improved dual camera system that offers breakthrough photo and video features, the first 7-nanometer chip in a smartphone — the A12 Bionic chip with next-generation Neural Engine — faster Face ID, wider stereo sound, a beautiful new gold finish and introduce Dual SIM to iPhone. iPhone Xs and iPhone Xs Max will be available for pre-order beginning Friday, September 14 and in stores beginning September 21. "iPhone Xs is packed with next-generation technologies and is a huge step forward for the future of the smartphone. Everything is state of the art including the industry-first 7-nanometer A12 Bionic chip with 8-core Neural Engine, faster Face ID and an advanced dual camera system that shoots Portrait mode photos with Smart HDR and dynamic depth of field," said Philip Schiller, Apple's senior vice president of Worldwide Marketing. "iPhone Xs is not one, but two new iPhone models, and iPhone Xs Max offers the biggest display ever in an iPhone with the biggest battery ever in an iPhone, delivering up to an hour and a half more battery life in your day." iPhone Xs and iPhone Xs Max build on the all-screen design of iPhone X and feature the sharpest displays with the highest pixel density of any Apple device. Now offered in 5.8-inch and 6.5-inch sizes,1 these Super Retina displays with a custom OLED design support Dolby Vision and HDR10 and have iOS system-wide color management for the best color accuracy in the industry. iPhone Xs and iPhone Xs Max offer a million-to-one contrast ratio with remarkable brightness and true blacks while showing 60 percent greater dynamic range in HDR photos. iPhone Xs Max delivers a more immersive experience with over 3 million pixels for videos, movies and games, offering the largest display ever in an iPhone in a footprint similar to iPhone 8 Plus. A

surgical grade stainless steel band now in gold joins finishes in silver and space gray. Wider stereo playback creates a more immersive soundstage. The front and back glass design features the most durable glass ever in a smartphone with improved scratch resistance, while the glass back enables faster wireless charging. iPhone Xs and iPhone Xs Max reach a new level of splash and water resistance of IP68 for up to 2 meters for 30 minutes and protect against everyday spills including coffee, tea and soda.2 The Apple-designed A12 Bionic, the smartest and most powerful chip in a smartphone, features the first 7-nanometer chip ever in a smartphone that delivers industry-leading performance in a more power-efficient design. A12 Bionic features a six-core fusion architecture with two performance cores that are up to 15 percent faster, four efficiency cores that are up to 50 percent more efficient, a four-core GPU that is up to 50 percent faster, powerful Apple-designed Image Signal Processor (ISP), video encoder and more. A fast storage controller can deliver iPhone storage up to 512GB. All of this unlocks new experiences for games, photography, video editing and graphics-intensive apps. Even with all this power, iPhone Xs offers 30 minutes longer than iPhone X, and iPhone Xs Max offers an hour and a half longer than iPhone X, between charges. The next-generation Neural Engine is built for advanced machine learning in everything from photography to augmented reality. A new eight-core design allows it to complete up to 5 trillion operations per second compared to 600 billion in A11 Bionic. This enables new capabilities like faster plane detection for ARKit and new features that use real-time machine learning. For the first time the Neural Engine is open to Core ML, empowering developers to build apps that utilize this highly efficient machine learning engine. Core ML running on the A12 Bionic Neural Engine is up to nine times faster than on A11 Bionic, with as little as one-tenth the energy usage. iPhone Xs continues to bring innovations to photography, things not possible before iPhone. Capabilities like advanced depth segmentation using the Neural Engine, Smart HDR creating photos with high dynamic range and great image detail, advanced bokeh quality in Portrait mode photos and dynamic depth of field that is user adjustable in the Photos app, are all huge improvements in state-of-the-art photographic techniques that everyone can use. The 12-megapixel dual camera system features dual optical image stabilization with 2x optical zoom, while a new sensor is twice as fast. Smart HDR creates photos with more highlights and shadow detail. Larger and deeper pixels improve image fidelity and low-light performance. Advanced depth segmentation in Portrait mode enables more sophisticated portraits with professional-level bokeh. New Depth Control allows users to dynamically adjust the depth of field both in real-time preview3 and post-capture to create portraits with a beautiful background blur. Portrait mode with Depth Control is also available on the TrueDepth camera for selfies, which includes Memoji and faster face tracking support for third-party ARKit apps. iPhone Xs and iPhone Xs Max deliver the highest quality video capture in a smartphone. The larger pixels and larger, faster sensor enable improved low-light performance and video stabilization, as well as extended dynamic range for more highlight and shadow detail in video modes up to 30 frames per second. Using the four built-in mics, users can also record stereo sound to get the most out of video recordings. Face ID, the most secure facial authentication system ever in a smartphone, is now even faster. The TrueDepth camera system uses precision depth-sensing technology that goes far beyond the capabilities and security of two-dimensional facial scanners and enables users to unlock iPhone, use Apple Pay, gain access to secure apps and many more features with a simple glance. iPhone Xs and iPhone Xs Max introduce Gigabit-class LTE for even faster download speeds4 and Dual SIM5 through the use of a nano-SIM and digital eSIM. iPhone Xs and iPhone Xs Max come with iOS 12, the world's most advanced mobile operating system. iOS 12 introduces new AR experiences, helps people rediscover and share photos, and makes communications more expressive and fun with new Animoji and Memoji. Screen Time helps customers understand and take control of the time they spend interacting with their iOS devices, Siri Shortcuts give any app the ability to work with Siri and new privacy features help protect users from being tracked on the web.

Arabsat, Newtec Sign Satellite Services Deal

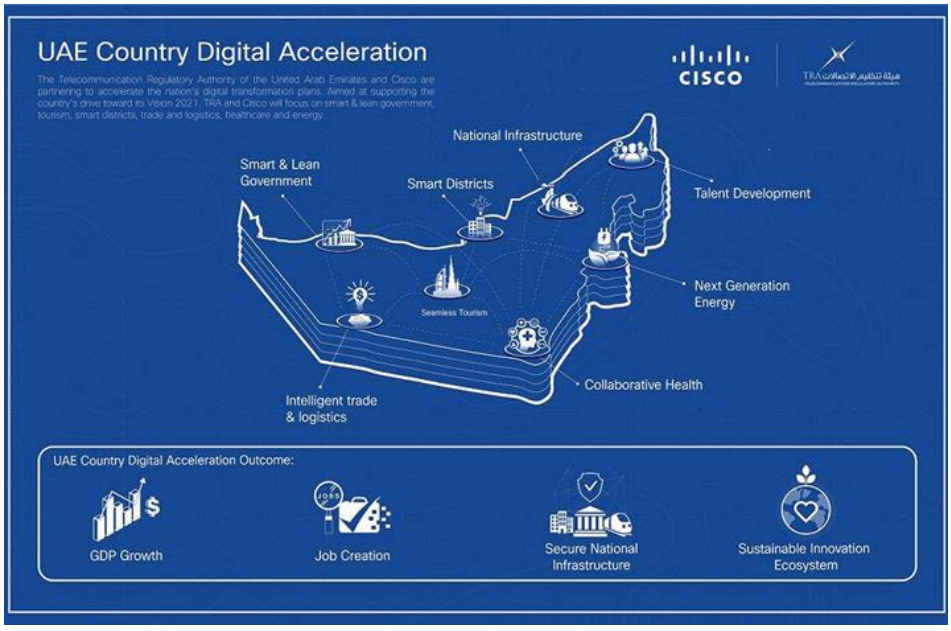
Newtec, a specialist satellite communication technologies and Arab Satellite Communications (Arabsat) have signed a new agreement to launch of new High Throughput Satellite (HTS) services in the Middle East and Africa. The agreement includes Enterprise and VNO services, IP Trunking and mobile backhaul for 3G and 4G services. Under the partnership, Arabsat will deploy a Newtec Dialog platform with a variety of Newtec's DVB-S2X Wideband modems. The specific modem used for each customer will depend on the market being served, with Newtec's portfolio providing vertical-specific solutions to deliver the best connectivity experience for any satellite application. "Expanding our partnership with Newtec in this way will help us meet rising market demand for high-throughput and high-performance services, pushing the boundaries of what is available today," said Khalid Balkheyour, CEO at Arabsat. "We chose to partner with Newtec after careful consideration of the market. We are confident that Newtec's proven expertise will enlarge our addressable market and maximize the benefits of HTS to achieve highest efficiency and throughput. This helps us provide the high-quality, cost-effective services our customers expect." Once launched, the new services will use Arabsat satellite capacity, with the initial hub expected to be installed in Europe within the next month. Newtec Dialog is a multiservice VSAT platform which enables operators to build and adapt satellite networking infrastructures according to specific needs. With Newtec's modems, it provides a choice of three return technologies, including MF-TDMA, SCPC and Newtec's unique, dynamic Mx-DMA which combines the best qualities of both to provide dynamic bandwidth allocation with the highest level of efficiency. "Our Newtec Dialog platform has a strong association with maximizing revenues to achieve the highest profitability, and with minimized risk, especially when being used to maximize the benefits of HTS networks," said Thomas Van den Driessche, CEO at Newtec. "We are proud Arabsat has chosen us to enlarge its addressable market and serve its most demanding customers, building on our long-term and very valued partnership." Newtec is showcasing the Newtec Dialog multiservice platform and its modem portfolio at IBC 2018, taking place at the RAI Amsterdam until September 18.

Cisco Unveils Server for AI and Machine Learning

Cisco is unveiling its first server built from the ground up for Artificial Intelligence (AI) and Machine Learning (ML) workloads, speeding up deep learning. Cisco is unveiling its first server built from the ground up for Artificial Intelligence (AI) and Machine Learning (ML) workloads, speeding up deep learning, a compute-intensive form of machine learning that uses neural networks and large data sets to train computers for complex tasks. Packed with powerful NVIDIA GPUs, it is designed to accelerate many of today's best-known machine learning software stacks. Data scientists and developers can experiment with machine learning on a laptop. But deep learning at scale demands much more compute capability. It requires an IT architecture that is capable of taking in vast sets of data. And tools that can make sense of this data and use it to learn. That is why Cisco is working with its technology partners to validate many of today's most popular machine learning tools: to help simplify deployments and accelerate time to insight. "Over the next few years, apps powered by artificial intelligence and machine learning will become mainstream in the enterprise. While this will solve many complex business issues, it will also create new challenges for IT," said Roland Acra, SVP and GM for Cisco's Data Center Business Group. "Today's powerful addition to the Cisco UCS lineup will power AI initiatives across a wide range of industries. Our

early-access customers in the financial sector are exploring ways to improve fraud detection and enhance algorithmic trading. Meanwhile in healthcare, they're interested in better insights and diagnostics, improving medical image classification, and speeding drug discovery and research. With the addition of the Cisco UCS C480 ML, Cisco now offers a complete range of computing options designed for each stage of the AI and ML lifecycle. From data collection and analysis near the edge, to data preparation and training in the data center, to the real-time inference at the heart of AI, customers are covered. Built for data scientists and developers: Today, thousands of customers use Cisco UCS to help them make sense of big data. Cisco's new server for AI and ML builds on its expertise of moving data from the edge to the core and goes further. It lets customers extract more intelligence from their data and use it to make better, faster decisions. With its new DevNet AI Developer Center and DevNet Ecosystem Exchange, Cisco is also giving data scientists and developers the tools and resources to create a new generation of apps. Built for IT: UCS makes it easy for IT to add new technology to their environment. With Cisco Intersight, they also get the simplicity and reach of cloud-based systems management. This lets them automate policy and operations for all their computing infrastructure from the cloud. And with Cisco validated designs to help demystify the rapidly evolving stacks of AI and ML software, IT can deploy with confidence at enterprise scale. Built with an ecosystem: Cisco is not working alone. It is embracing containers and multicloud computing models to make it easier to deploy open source software at scale, no matter where apps live. It is validating machine learning environments and software such as Anaconda, Kubeflow, and solutions from Cloudera and Hortonworks on the new server. UCS customers who use Kubeflow running on top of Kubernetes will find it easy to deploy AI workloads directly to Google Kubernetes Engine, taking advantage of both on-prem and cloud ML capabilities. The Cisco UCS C480 ML M5 Rack Server builds on Cisco's portfolio of UCS B-Series, C-Series, and HyperFlex systems. It will be available to buy from Cisco partners in Q4 2018, along with a range of AI and ML support capabilities from Cisco Services that span analytics, deep-learning and automation.

Cisco and Telecommunication Regulatory Authority Work Together for the UAE's Digital Future



Cisco announced it has signed a Memorandum of Understanding (MoU) with the Telecommunication Regulatory Authority of the United Arab Emirates (TRA) to accelerate digital adoption and boost cooperation for the UAE's digital future. The MoU is a key addition to Cisco's Country Digital Acceleration (CDA) program in the UAE, which aims at building and enhancing a strategic relationship with national leadership, industry, and academia to help accelerate the national digitization agenda. "Developing the UAE's digital infrastructure is one of the government's major drives. It is closely aligned with the leadership's directives to provide a favorable environment for technological development that enables future solutions, while contributing to the objectives of the national agenda and the UAE Vision 2021," said Hamad Obaid Al Mansoori, TRA's Director General. Al Mansoori added: "The MoU between the TRA and Cisco represents our interest in fostering the relation with globally leading partners to accelerate smart transformation in government work and in life on a wider scale. The public-private partnership is an imperative factor in ensuring the success of our strategies for the future, as we are working together to set the scene for the application of IoT, and the concepts of artificial intelligence." Chuck Robbins, CEO and Chairman of Cisco commented: "Cisco is proud to support the UAE's efforts to transform into a digital economy. Working together, we will help create an ecosystem for innovation and job creation, and we look forward to many more years of cooperation and collaboration." "The UAE's Vision 2021 connects digital transformation and technology innovation to outcomes that are truly relevant for society, such quality of life and happiness. At Cisco, we are proud to work with the Telecommunication Regulatory Authority and contribute to the acceleration of the UAE's national digitization plans. We are confident that our cooperation will result in world class references for digital innovation," said Shukri Eid, Managing Director – East Region, Cisco Middle East.

Eutelsat Takes a Further Step in the Integration of Satellite into the IP Ecosystem

Eutelsat Communications (NYSE Euronext Paris: ETL) is launching Eutelsat CIRRUS, a hybrid satellite-OTT delivery solution, enabling broadcasters to offer a flexible, seamless content experience across multiple screens. Eutelsat CIRRUS will provide a turnkey content delivery solution via satellite and OTT to operators seeking to launch or upgrade their service, offering the benefits of rapidly deployed video services, low operational costs, high image quality and consistent end-user experience. Through its dual offer of turnkey DTH services and OTT multiscreen delivery, this new service represents a further step for Eutelsat in the integration of satellite into the IP ecosystem. Eutelsat CIRRUS' turnkey DTH service will provide satellite TV broadcasters with end-to-end video distribution combined with cloud-based service management. Bringing together the strengths of traditional DTH with next-generation features, the fully integrated platform will deliver an enriched viewer experience through live channel broadcasting, channel numbering, program information, content security, subscriber and set-top box management. A multi-screen offer will complement the traditional DTH broadcast service with simultaneous OTT streaming through a native hybrid platform. It will enable end-users to watch video content on devices such as mobile phones and tablets, access multiple programmes, record and rewind, and view a rich array of program information, while providing business rules management and usage reporting for Eutelsat's broadcast customers. Eutelsat CIRRUS is built on an innovative roadmap guaranteeing product evolution and ensuring the delivery state-of-the-art features for viewers by enabling operators to integrate new features and maintain a competitive offer without the need for support or technical upgrades. "Eutelsat CIRRUS reinforces our value proposition in the video segment, which is at the core of our business. It will offer our customers the best of both worlds, combining the efficiency and reach of satellite with the convenience of OTT. This new hybrid solution is designed to facilitate the building of a content distribution business. It will free up broadcasters to focus on content and subscribers while Eutelsat takes care of the end-to-end logistics, accompanying them in maintaining their competitive edge in an increasingly complex environment", said Gerry O'Sullivan, Executive Vice President, Global TV and Video of Eutelsat. Rodolphe Belmer, CEO of Eutelsat, concluded: "The launch of Eutelsat CIRRUS sits firmly within our broader strategy to reinforce and develop our core video vertical. By leveraging new technologies to deliver appropriate solutions to the evolving needs of our broadcast partners, we seek to reinforce customer proximity and loyalty and develop new growth opportunities for our group."

Orange Slovensko Selects EUTELSAT 16A to Expand Its Pay-TV Offer Via satellite

Orange Slovensko has signed its first-ever multiyear contract with Eutelsat Communications (Euronext Paris: ETL) expanding its pay-TV offer via satellite and enabling a nationwide reach across Slovakia. Eutelsat's 16° East position is already a key video neighborhood for Slovakia thanks to its exceptional channel line-up tailored to local viewers. Orange Slovensko will broadcast from EUTELST 16A satellite to extend its existing offer to reach households not covered by its FTTH network. Under this contract with Eutelsat, the platform delivers 38 channels, with more than half in HD. These channels are available in 3 main pay-TV packages, plus additional thematic and premium channel add-ons, starting at 6 euros per month. The service includes exclusive distribution of Orange Sports channels, home of Champions League matches for the Slovakian territory for the next three seasons as well as other highly valued football, ice hockey, basketball and mixed martial arts (MMA) content. Pavol Lančarič, CEO of Orange Slovensko said: "By launching our own Orange TV satellite service, the availability of our television services to the public will grow dramatically. The premium content offered by our television will be available to almost all Slovaks." Michel Azibert, Chief Commercial and Development Officer of Eutelsat, added: "We are delighted to be working with Orange Slovensko as they expand their pay-TV offer to all of Slovakia. This contract reflects the efficiency of satellite to reach communities across a territory and the strength of EUTELSAT 16A's coverage over Central Europe. We look forward to continue working with Orange Slovensko as its offer evolves to guarantee the best quality of content to audiences across the country."

Eutelsat Signs Long-Term Multiple-Launch Service Agreement with Arianespace

Arianespace and Eutelsat Communications (NYSE Euronext Paris: ETL) have concluded a long-term multiple-launch service agreement on the occasion of the World Satellite Business Week in Paris. The agreement covers five launches until 2027 and will provide Eutelsat with assured access to space with schedule flexibility at cost effective prices. With this agreement, Eutelsat is the first commercial customer to sign up to Ariane 6, Arianespace's next-generation launch vehicle, expected to start service from 2020. This new long-term commitment builds on the previous contract signed by Eutelsat and Arianespace in February 2013, which was expanded in 2017. Under these earlier agreements, three future Eutelsat satellites, EUTELSAT 7C, EUTELSAT QUANTUM and KONNECT, are already scheduled for launch on Ariane 5. Rodolphe Belmer, CEO of Eutelsat Communications, said: "We are proud to be the first operator to commit to Ariane 6. This emblematic European programme will further enhance our ability to gain access to space in a timely, competitive and reliable manner. It strengthens our relationship with our long-standing partner, Arianespace, which has already been entrusted with the launch of half of our fleet. Furthermore, it illustrates the key role of Eutelsat in the development of the space sector, while underpinning our commitment to enhancing the efficiency of our satellite programmes." Stéphane Israël, CEO of Arianespace added: "We are delighted that Eutelsat has chosen Arianespace to launch five of its upcoming satellites, in addition to the three already in our order book. With this multi-launch agreement, Eutelsat becomes the first commercial customer for Ariane 6. I would like to extend my warm thanks to Eutelsat for their confidence in Arianespace and our Ariane 6 launch vehicle. At the same time, their selection clearly shows Arianespace's ability to offer our customers long-term partnerships and increasingly flexible solutions."

Facebook, Banglalink Launch Joint Empowerment Program

Private mobile operator 'Banglalink' and Facebook have announced to launch a digital empowerment program in Bangladesh. The program will train 20,000 Banglalink retailers and 4,500 dedicated promoters and will reach out to 20 lakh customers over the next two years. The program titled 'Learn Internet, See the World', was announced by Ritesh Kumar Singh, Chief Sales and Marketing Officer of Banglalink at a press conference at Le Méridien Hotel, said a press release. Ritesh Kumar Singh said "Banglalink has been working relentlessly over the years to ensure digital facilities at every corner of the country. We firmly believe that this joint campaign will take us one step closer to the fulfillment of our vision." The program will provide basic training on the usage and benefits of Internet along with guidance on using Facebook to remain connected with friends and family. Taimur Rahman, Chief Corporate and Regulatory Affairs Officer of Banglalink and other high officials of Banglalink and Facebook were also present on the occasion.

Facebook Holds 'Tech Week' to Train Entrepreneurs

Facebook is set to celebrate the Middle East and North Africa (MENA) region's vibrant startup ecosystem with exclusive set of workshops and events at 'Facebook MENA | Tech Week'. Taking place from October 1 to 3 at the Beirut Digital District (BDD), Facebook's Tech Week will run over the course of three days, and will bring together various groups including start-ups, small and medium businesses (SMBs), women entrepreneurs, and developer circles. The final day (Oct 3) is set for TechCrunch Startup Battlefield in Mena, the most renowned start up competition in the world brought to the region for the first time. Ari Kesisoglu, Vice President for Middle East, Africa & Turkey at Facebook, said: "Technology is giving people new opportunities to become entrepreneurs and content creators, and at Facebook our mission is to give people the power to build community and bring the world closer together. Businesses and creators have a unique opportunity for growth in connecting with 181M monthly active Facebook users in the Middle East and North Africa and we want to help them do that by providing the right trainings and programs." He continued: "Our overall goal of holding 'Facebook MENA | Tech Week' is not just to inspire and celebrate the startup and wider tech community across the region but also to connect, listen and learn from them." The three day-long events are aimed at celebrating and uncovering the best innovators, makers and entrepreneurs in region. Here is a summary of the Facebook MENA | Tech Week and how you can attend:

- Women in Technology Panel: An inspirational afternoon with woman in the Technology sector sharing their experiences with speakers from Facebook, McKinsey and Anghami.
- Women in Technology training: The panel will be followed by a training session by Facebook Engineering Manager Carine Daouk, as she tackles topics such as Building Resilience and Communication.
- SMB Training 101' workshop: To support rising entrepreneur talent, Facebook will host a training for small and medium business owners that will help them understand FB tools that can grow their business.
- Celebration of Lebanese Tech training and networking event: This event will hold a performance marketing training from Facebook employees, followed by a panel of experts discussing opportunities and challenges for Lebanese developers and tech enthusiasts.
- #SheMeansBusiness training: Across two training sessions, attendees will be able to learn about using Facebook tools to grow their businesses as well as the tips and tricks to leverage Facebook and Instagram stories for maximum impact.
- #SheMeansBusiness Panel: To be further inspired, guests can also hear from successful female entrepreneurs from the region at a dedicated panel session that explores brand-building in a digital era.
- TechCrunch Startup Battlefield: bringing early stage startups together across the region including Lebanon, Jordan, Kuwait, Saudi, UAE, Bahrain, Egypt, Algeria and others. The Battlefield will present start-ups the opportunity to compete and win a USD25,000 prize, as well as being exposed to a big global investment community. Additionally, two members from the winning startup will receive an all-expenses paid trip to participate in a future TechCrunch Disrupt San Francisco.

Facebook Expands Its #SheMeansBusiness Program in Pakistan

Facebook today launched its #SheMeansBusiness program with the Universal Service Fund (USF) in Islamabad and the Punjab IT Board (PITB) in Lahore. The program helps equip women entrepreneurs with the knowledge, connections, skills and technology required to build and grow their businesses online. Aligned with Digital Pakistan's mission, Facebook's #SheMeansBusiness partnership with USF and PITB aims to reach 20,000 women across Pakistan over the next three years, delivering digital skills training with a focus on small business development and online safety. The PITB partnership includes a three month digital literacy program offered as part of PITB's 'Herself' initiative. Since its beginnings on International Women's Day in 2016, #SheMeansBusiness has established an active presence in 21 countries, including Pakistan, and has trained more than 42,000 women entrepreneurs. "When women do better, we all benefit. More women are employed, more role models are created, and there is stronger diversity," says Clair Deevy, Director of Community Affairs, APAC. "Women are doing amazing things on Facebook around the world with the support and encouragement of the #SheMeansBusiness community. Our partnerships in Pakistan with USF and PITB will hopefully help inspire and empower more Pakistani women to start and grow a business." Globally, 43% of the active small businesses Pages on Facebook are owned by women, with this percentage growing by more than 21% in 2017, and by more than 94% year-on-year since 2015. This growth is a catalyst to establishing new partnerships in countries such as Pakistan where there is a fresh focus on digital inclusion and empowering women. The difference the program can make is supported by Facebook's Future

of Business survey. Carried out with the World Bank and OECD, the survey found that businesses run by women are more likely than those run by men to leverage online tools to drive success and that higher rates of entrepreneurialism are found among women in less developed markets. Women in these economies are driven to pursue entrepreneurial paths to provide for their families, generally through basic types of consumer-focused products and services businesses. By doing so, they can become a real engine for their local economies. The same research says that realizing the potential of women entrepreneurs generates benefits ranging from job creation and economic growth, to a more diverse small business community. That's because entrepreneurs create jobs for themselves and enrich the lives of people including employees, investors, suppliers and the organizations they work with. Speaking at the #SheMeansBusiness launch in Islamabad, CFO of USF, Haaris M Chaudhary said: "#SheMeansBusiness is a great initiative and an excellent opportunity for USF ICT for Girls Program, and using a 'train the trainer' approach enables the female student beneficiaries to learn the tools and techniques for running their own businesses." He also said; "the training involves important topics like Digital Safety which creates awareness on issues like protecting identity theft and using the internet responsibly and safely. Making these girls financially independent in a safe environment is the core objective of USF program and this collaboration with Facebook will go a long way in enabling the socioeconomic development of women in Pakistan." The program runs for the rest of this year and will kick-off in Islamabad on 13 September and in Lahore on 14th September 2018.

Facebook to Build Data Center in Singapore

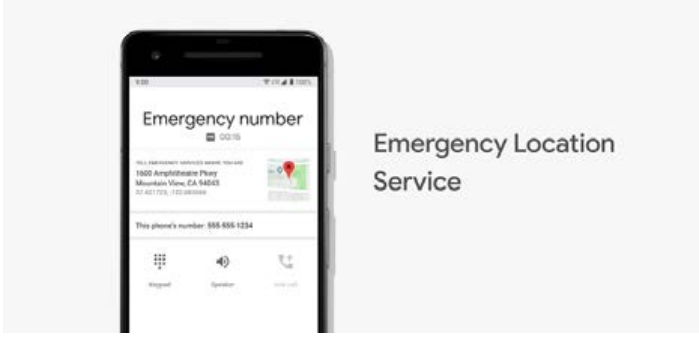
Facebook has revealed that its first custom-built data center in Asia will be located in Singapore. The 170,000 square meter data center represents an investment of more than S$1.4 billion (USD1.01 billion), and forms part of the company's growing presence in Singapore and across Asia. "We selected Singapore for a number of reasons, including robust infrastructure and access to fiber, a talented local workforce, and a great set of community partners, including the Economic Development Board Singapore and JTC who have helped us move this project forward," said a statement released to the press. The statement further said that Singapore has also established policies that foster a business-friendly environment, including measures that support the enforcement of contracts and increase the ease of construction permitting. The World Bank recently named Singapore as the number one country in Asia to do business. The Singapore Data Center will join Facebook's portfolio of facilities designed from the ground up with new features to minimize the use of water, energy, and land, according to the company. Citing an example, the company said the data center will be the first to incorporate the new StatePoint Liquid Cooling system. This technology minimizes water and power consumption and, according to the company's testing, can reduce the amount of peak water used by 20% in climates like Singapore's. "We expect this facility, like all of our data centers, to be powered by 100% renewable energy and we are currently working to increase the development of new solar resources in Singapore," said Facebook in the statement. "When compared to other facilities in the region, it will be a leader in energy efficiency with annual Power Usage Effectiveness of 1.19. This means that almost every watt going into our data center will be used to run the computing equipment." Finally, to conserve space, Facebook has developed a new 11-story building design specifically tailored to Singapore. The building façade is made out of a perforated lightweight material which allows air flow and provides glimpses of the state-of-the-art mechanical equipment inside. In order to complete this project, Facebook has selected Fortis Construction to act as general contractor because of our joint experience building efficient data centers. "This data center, and the hardware inside, will help people stay connected with friends and family, discover what is happening in the world, and share and express what matters to them. And we are thrilled to be building it here in Singapore," said Facebook in the statement.

Google Set to Re-launch in China after 8-Year Censorship Exodus

Google has unveiled a new search experience making it easier for job seekers in the region to find employment opportunities from popular job listing websites, online classifieds and companies. The new feature is built directly into Google Search to provide a comprehensive listing of jobs across the web. At launch, job search will have hundreds of thousands of job listings from thousands of sites, including Mustakbil.com, PaperPK.com, Bikroy.com, Ikman.lk and Xpressjobs.lk. Job seekers can now search for "part-time jobs," "software developer jobs" or similar unique job-seeking queries, to pull out a special module that can be expanded to a more immersive experience. Clicking on any job in this listing opens an at-a-glance view of comprehensive information about the posting such as job title, location, whether it is full-time or part-time, and several other important details - from summaries and links to reviews and ratings of the employer by trusted sources, to the commute between the workplace and home. The feature will then direct people to the job listing page on the respective website to learn more information or submit their application. Built to work both on mobile and desktop, job search comes equipped with a number of tools, making it easier for job seekers to find opportunities that fit their unique needs. With smart filters for categories such as job type, location, posting date, or company type, people can get customized results with a couple of taps. Job listings can also be saved or shared with friends and colleagues, and people can sign up for alerts to receive notifications when relevant new listings are posted for those searches. To help the larger ecosystem of job providers, Google has released open documentation, which will assist organizations big and small to make their job openings discoverable on the new search experience, using open structured schema.org web markup standards that Google supports. Businesses can benefit from the new experience by making their job listings more discoverable on Google, creating a win-win situation for both job-seekers and employers. The Search experience is available in English on the Google app on Android and iOS, and in Google Search on desktop and mobile

Google Launches Emergency Location Service in U.S. with T-Mobile

Emergency responders will be able to find T-Mobile E911 callers on Android faster and more accurately thanks to Google's launch of Emergency Location Service (ELS) with T-Mobile and RapidSOS. Finding E911 callers has become an increasingly urgent problem for the wireless industry. More than 80% of calls to 911 in some regions now come from wireless phones, not landline phones, and the FCC requires carriers to locate callers to within 50 meters at least 80% of the time by 2021. Google announced ELS in Android back in 2016, explaining that it offers a faster, more accurate location to emergency communications centers when an Android user makes an E911 call. It uses a combination of GPS, Wi-Fi, mobile networks and sensors for both indoor and outdoor location. The service is already deployed in other parts of the world. In Austria, a mountain biker in a remote, heavily forested area suffered an accident and called emergency services for help. The legacy emergency location systems provided a location with a radius of more than 900 meters (about half a mile), while ELS was able to provide a location within 12 meters (39 feet) to help first responders locate the biker, according to a blog post by Jen Chai, Android product manager at Google. ELS is supported on 99% of Android devices with version 4.0 and above, so it should make quite an impact for T-Mobile. The location is computed on the device and delivered directly to emergency providers—without passing through Google servers, and only when a customer explicitly calls an emergency number. Google also said it has already launched ELS in the U.S. Virgin Islands through a partnership with West and a regional wireless provider, Viya. West is an emergency technology company that works directly with wireless providers. For Android users on Viya, the integration with West allows more accurate location data to be delivered more quickly with ELS to



emergency centers through existing channels. Google clarified that wireless carriers already use location technology to send a caller's location to emergency centers, but the integration of ELS is built on top of that to help deliver higher accuracy faster than before. Most T-Mobile customers with Android devices will now send location data from Google's ELS, but in markets where RapidSOS is integrated into emergency call centers, Android users will send the information through the startup company, according to The Wall Street Journal. RapidSOS, a startup featuring three former FCC commissioners on its board, explained that the deal with Google follows a pilot project the two conducted in three test regions in earlier this year to evaluate an integration of Android ELS with the RapidSOS NG911 Clearinghouse. ELS location was captured via the NG911 Clearinghouse and transmitted to the pilot Public Safety Answering Points (PSAPs) as supplemental location for some wireless 911 calls. The results showed that ELS location via the NG911 Clearinghouse provided more accurate location data and a faster speed of delivery. RapidSOS CEO and co-founder Michael Martin told FierceWirelessTech last year that direct

relationships with U.S. wireless operators wasn't required but that the company was trying to partner with them. The company spent several years working closely with thousands of public safety officials across the United States to develop a universal data link into 911 and first responder networks. Martin himself spent a summer of grad school driving a borrowed Prius to visit PSAPs across the country in an effort to improve 911 systems. In June, Apple announced it will use technology from RapidSOS to improve the location information sent to emergency responders when iPhone users call 911.

Google Android OS to Power Renault-Nissan-Mitsubishi Media Displays From 2021

The Renault-Nissan-Mitsubishi Alliance will be using Google's Android operating system to power the dashboard media display in its future cars, worldwide. The alliance, which last year sold a total of 10.6 million vehicles worldwide, has picked Google's OS for its next-generation infotainment, set to debut in 2021. This means the dashboard will better integrate Google's maps, app store and voice-activated assistant.

Huawei and Vodafone Complete the Second Phase of Cloud-Based BNG Validation

Vodafone and Huawei recently completed the second phase test of the cloud-based Broadband Network Gateway (BNG) solution in a fixed broadband scenario. This proof of concept was deployed in Vodafone Portugal's premises according to Vodafone Group guidelines, demonstrating the capability of Huawei's cloud-based BNG solution to evolve existing networks and lay a solid foundation for cloud-based BNG projects. The BNG solution used the Control & User Plane Separation (CUPS) architecture, which offers improved capabilities for scaling, resilience and efficient IP address use. The phase I testing was performed in December 2017 and focused on 52 functional tests of the solution, while the phase II testing, completed in May 2018, focused on the Vodafone Portugal service architecture including internet access and VPN services. Both phase I and II have been completed successfully. The scope of this proof of concept included access, authentication and accounting for home broadband users in various scenarios. It also included performance, reliability and security testing of cloud-based BNG systems. Vodafone and Huawei verified functionality of the cloud-based BNG solution using virtual network functions (VNFs) as the control plane and also using physical network functions (PNFs) as the user plane. The cloud-based BNG solution decouples the control and user planes of traditional BNG architectures. The control plane integrates the user management functions of multiple BNGs and shifts their resources to the cloud. In addition to automated service provisioning and network O&M, the solution deployment in the cloud also enables global resource sharing, elastic capacity scaling, flexible architecture adjustment and network capability exposure. João Nascimento, CTO at Vodafone Portugal, said: "Cloud-based BNG is an effective way to improve network resource utilization and shorten time to market for new services. During this round of testing, we were able to verify the feasibility of evolving existing network devices to the cloud." Jeffrey Gao, President of Huawei's Router & Carrier Ethernet Product line, stated: "Cloud-based BNG is an innovative implementation of Huawei's Intent-Driven Network in the context of network service cloudification. The Intent-Driven Network decouples traditional networks into an elastic, reliable bearer layer and an agile service layer. This creates a simple architecture enabling the rapid and flexible adjustment of resources. This solution helps operators improve the efficiency of their network operations, reduce O&M costs and smoothly evolve network services to the cloud." Huawei and many leading operators have engaged in close cooperation to innovate cloud-based BNG solution, which has achieved staged achievements. In the future, Huawei will rely on its strong innovation strength and continuous R&D investment to help operators enable metro network cloudification transformation. The fifth Ultra-Broadband Forum (UBBF 2018) will be held from September 10th to September 11, 2018, in Geneva, Switzerland. UBBF this year has chosen 'Intent-Driven Network: Maximize Your Business Value' as the theme. By focusing on four hot topics 'Premium Home Broadband, Reshaping User Experience', 'Cloud-and-Network Synergy, Enabling New Growth with B2B', 'Constructing 5G- and Cloud-based Simplified Networks', and 'Toward Optical Networking 2.0', this event presents an opportunity to share business innovations and practices of Intent-Driven Network.

Huawei 5G Transport Network Key Technologies Pass EANTC Testing

Huawei's 5G key technologies of CloudMetro solution recently passed rigorous testing by the European Advanced Networking Test Center (EANTC), an internationally recognized independent test center. This indicates that Huawei's 5G transport of CloudMetro solution is ready for commercial use. Huawei's CloudMetro solution embodies three essential concepts: simplified architecture, simplified protocols, and simplified O&M. The simplified architecture concept is reflected in the decoupling of service and transport layers. This allows the service layer to focus on agility and innovation, while the transport layer can focus on stability and reliability, elastic network expansion, and network programmability. This not only lowers maintenance requirements and costs but also enables smooth protocol evolution. The simplified O&M concept is reflected in automated and visualized management of the full network lifecycle. This covers network planning, design, implementation, O&M, and optimization. 5G transport is one of important scenarios of CloudMetro, and EANTC carefully considered the preceding points during its testing of Huawei's CloudMetro solution. In the test, Huawei used its 5G transport series products for networking to achieve line-rate forwarding with ultra-low latency (15 µs per hop) at a transmission distance of 40 km. The test result shows that Huawei's 5G transport of CloudMetro solution can provide service access through 10GE and 25GE interfaces, and the 50GE and 100GE access rings meet the requirements for low-cost network construction and subsequent smooth evolution. Huawei has proposed a smooth protocol evolution solution for traffic carried through MPLS tunnels on the live network. This solution replaces RSVP-TE/LDP with SR and interconnects EVPN with MPLS VPN. The test result shows that no packet loss occurs after traffic is switched to SR tunnels for transmission. Automated O&M is a key feature of the CloudMetro solution, covering network visualization, service automation, and intelligent O&M. In terms of network visualization, NCE displays detailed information about microburst traffic based on traffic statistics collected by Telemetry, enabling real-time perception of network resources. In terms of service automation, NCE supports one-click deployment of SR and EVPN, intelligent path selection based on a maximum of nine constraints, and 360-degree service visualization, enabling automated service provisioning in minutes. In terms of intelligent O&M, NCE uses online what-if analysis to simulate migration scenarios based on historical data and predict appropriate maintenance windows, and automatically adjusts and restores service traffic. Huawei uses network slicing to meet the diversified SLA requirements of different metro network services. A slice can be flexibly created and adjusted at a bandwidth granularity of 1 Gbit/s. Unlike FlexE, which has to provide network slicing based on hardware, interface channelization can provide network slicing through software upgrade. Carsten Rossenhoevel, CTO of EANTC, said: "We evaluated a wide range of functions of Huawei's CloudMetro solution. We can confirm that Huawei's 5G transport series products are getting ready to meet the challenges of metro network cloudification. Huawei's support in the ultra-broadband sector, in slicing, in the evolution from MPLS to next-generation transport, and in the management and analysis functions is really great." The test result highlights Huawei CloudMetro's innovation capabilities in metro network evolution and 5G transport. Huawei will continue to provide leading products and solutions to help global operators achieve business success through digital transformation.

Huawei Committed to Supporting Saudi ICT Sector to Achieve Vision 2030

The Kingdom celebrates its eighty-eighth National Day as a new step toward achieving Vision 2030, which is based on innovation in advanced technologies to continue raising the capabilities of its young Saudi youth male and female in various sectors so that will be the main driver in the continuous development and success of life in the Kingdom of Saudi Arabia For years, Huawei, which is one of the largest technology companies investing in the Kingdom working on actual contribution and support of the Kingdom›s efforts to build a new generation of entrepreneurs who are familiar with the technology industry and transferring knowledge and skills to Saudi youtAchieving the Kingdom›s Vision 2030 requires having national resources and capabilities that have the potential to implement the vision with successfully. "At Huawei, we have been working to provide our full support to the development of the ICT sector in Saudi Arabia so that we can contribute to a sustainable knowledge-based economy and help build more sustainable communities in Saudi Arabia." In the Kingdom, young people and entrepreneurs are aiming to make an important jump in the ICT sector. No doubt, Saudi Vision 2030 is a strong driver for the ICT sector. "We are working on Huawei to provide more investments that will bring further progress to promising Saudi youth." For Huawei, the Kingdom›s Vision 2030 has set a strong start toward contributing to social and economic development at the local level by creating jobs and investing heavily in local talent through training centers and joint innovation centers. Today, it is necessary to focus on integrating highly skilled Saudi youth into the industry, supporting and embracing all aspiring people who unleash their dreams, aspire to these ambitions, and make everything possible. What does the eighty-eighth National Day mean? It means a lot. This day is valuable to all residents of the Kingdom, feeling happy when they witness the developmental achievements extended to all regions of the Kingdom, whether these achievements on economic, scientific, technology or other industries, which establishes the Kingdom as a modern state and speaks the language of technological development that all countries in the world aspire to. Huawei is committed to supporting the ICT sector›s trends and policies in Saudi Arabia and providing all the needs and requirements that can contribute to the growth and development of this sector in the Kingdom.

Huawei Launches its Most Powerful 5G Ready Chipset – the Kirin 980

Huawei has launched the Kirin 980 chipset which will underpin its next generation of 5G smartphone devices. Speaking exclusively to journalists at the IFA event in Berlin today, Huawei's CEO Richard Yu said that the chipset would revolutionize connectivity for next generation devices. "Last year, we showed the world the potential of On-Device AI with the Kirin 970, and this year, we've designed an all-round powerhouse that not only features outstanding AI capabilities, but also brings cutting-edge raw performance to consumers," said Yu. "Equipped with all-new CPU, GPU and Dual NPU, the Kirin 980 is the ultimate engine to power next-generation productivity and entertainment applications." The Kirin 980 is the world's first Cat 21 modem for a smartphone, offering download speeds of 1.4Gbps. The chipset also deliver some of the fastest download speeds for a mobile device over WiFi. In tests alongside Huawei's Hi1103 system, the Kirin 980 chipset recorded download speeds of 1.7Gbps. The Kirin 980 is comprised of 8 cores – 4 little, 2 large and 2 turbo – providing ultrafast processing speeds and very low latency. Huawei's flagship chipset will offer improved performance for key smartphone applications, such as heightened photography, UHD video and online gaming capabilities. Online gaming is a rising trend in smartphone usage, and Huawei has designed its latest chipset with gamers in mind. The Kirin 980 delivers frame rate of 59.3 frames per second, compared to 48.5 fps for its nearest competitor (Qualcomm's

SnapDragon S845), giving a dramatically smoother experience. Huawei's new chipset will also significantly reduce loading time for web based applications. The load time for the Facebook app to open is now just 1 second, down from 1.3 seconds, compared with Huawei's Kirin 970. Huawei will start using the Kirin 980 in its next generation smartphone handsets, the Huawei Mate Pro series, from October 2018.

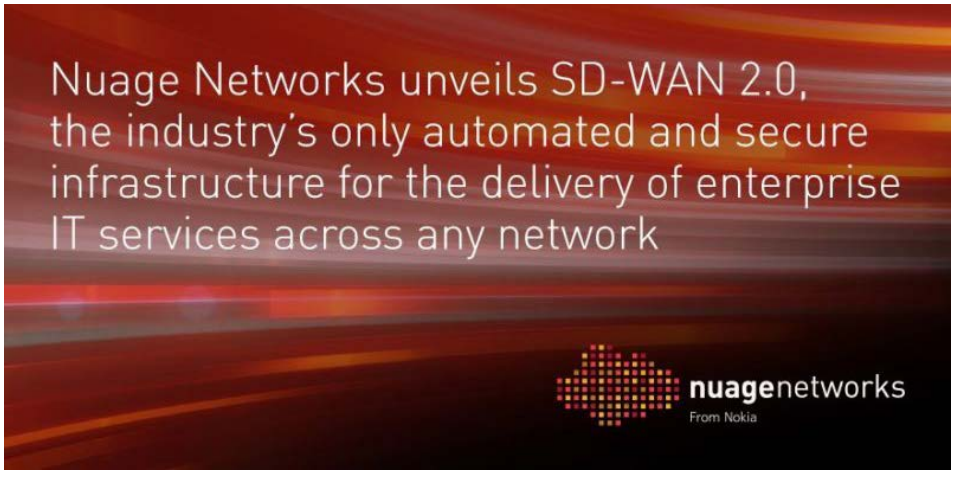
Huawei Helps TIM and Fastweb Launch the First 3GPP Standard 5G Commercial Base Station

TIM and Fastweb put the first 5G base station (complying with 3GPP standards) into commercial use, featuring Huawei's end-to-end (E2E) 5G equipment. The three partners also jointly demonstrated ten 5G use cases in the cooperation. Luigi Di Maio, Deputy Prime Minister of Italy and Minister of Economic Development, Labor and Social Policies, attended the inauguration ceremony to press the startup button for the deployment of the first 5G base station. TIM and Fastweb intend to provide the cities of Bari and Matera with 5G commercial coverage (75% of the population) by the end of 2018. The Deputy Prime Minister pressed the startup button for the first 5G base station deployment. TIM, Fastweb and Huawei used this opportunity to jointly demonstrate a total of ten 5G use

cases at Fiera del Levante in Bari. These use cases focus on Smart City and Transport, Environment and Heritage, Smart Health, Smart Port, AR/VR, Smart Culture and Tourism, Smart Road, Smart Agriculture, etc. "5G will be the most important enabling factor for many innovative services that can revolutionize the lives of citizens and businesses, effectively implementing the gigabit social paradigm," said Mario di Mauro, Strategy and Innovation & Customer Experience Officer of TIM. "The new and demonstrated use cases launched with the Bari Matera 5G project are part of a large portfolio for innovative solutions that Telecom Italia is developing to accelerate the digitization of the country." Andrea Lasagna, Fastweb's Chief Technology Officer, highlighted, "The potential of 5G is endless and able to deeply transform our way of life. The lighting of the first 3GPP 5G base station in Bari marks a new important milestone in the path of innovation of the Bari Matera 5G project." As a long-term business partner of TIM and Fastweb, Huawei has provided a series of E2E 5G commercial devices to help construct core networks and access networks, as well as customer premise equipment (CPE). "Research, investments in the territory, and collaboration with the partner ecosystem are at the base of the Huawei philosophy and can be seen in the use cases presented at the Fiera del Levante, one of the most significant achievements in Italy," said Luigi De Vecchis, President of Huawei Italia. "We believe that this marks a significant step for the creation of digital services and a unique opportunity for development not only for Puglia but for the whole of Italy."

Nokia Nuage Networks Unveils SD-WAN 2.0

Nokia is introducing the latest release of the Nuage Networks Virtualized Network Services (VNS) platform, offering the most powerful and secure end-to-end network governance across a multi-cloud environment, with complete visibility and control from a single management interface. Nuage Networks VNS is the industry's first and only SD-WAN 2.0 offering that is more than a network connectivity platform, providing a services architecture to deliver and orchestrate enterprise IT services across data centers, public cloud services, SaaS provider clouds and enterprise branch sites. Enterprise IT departments have embraced the concept of SD-WAN, with leading telecommunications research firm IDC forecasting the worldwide market for SD-WAN infrastructure will record a compound annual growth rate (CAGR) of 40.4% from 833 million in 2017 to more than 4.5 billion in 2022. IDC expects the market will expand by about 58% in 2018 to be worth more than USD1.3 billion. First-generation SD-WAN solutions have been limited in scope to automating and managing connectivity of branch offices, which are underserved by IP-VPN services. However, as more enterprises migrate their business applications to the cloud, they must provide seamless WAN connectivity. This includes connectivity not only between customer premises equipment at branch and regional sites, but also to their private data centers, SaaS providers and public clouds - all within a unified security and governance model. Moreover, there is demand from enterprise customers to leverage this services platform to deploy and manage Value Added Services including VoIP, Next-Generation Firewall, IoT, and WiFi Access. Nuage Networks VNS is the only SD-WAN 2.0 offer in the industry that is purpose-built to solve these new enterprise IT challenges with a seamless, automated and unified next generation solution. Nuage Networks SD-WAN 2.0 opens up a new dynamic in networking by providing services with flexible multi-cloud capabilities, the industry's most robust, built-in end-to-end security and a versatile architecture to deliver value-added services anywhere. These capabilities provide an immediate reduction in operational expenses and cost, superior agility, operational consistency across a multi-cloud environment and the ability to offer a diverse set of applications and services that can be consumed at the branch and/or the cloud. Longer term, the platform enables enterprises to future-proof their networks, addressing not only today's IT challenges, but also quickly adapting to their future needs. Nuage Networks is continuing its strong push in the next generation SD-WAN market with recent contracts with service providers and enterprises from around the world including Banco Multiva, Cogeco Peer1, Credit Andorra, Etisalat, Equal, Globe Telecom, NTT Com India, Orange X, Telefonica, UPMC, and Vertel, in addition to over 50 service providers world-wide that have selected Nuage Networks VNS for their managed SD-WAN offering.



With over 400 enterprise customers, Nuage Networks VNS is increasingly the choice of global carriers and enterprises looking to automate, secure and optimize their IT processes as well as their WAN, datacenter and public cloud networks. Patrick Farges, sales & marketing leader at Orange X, said: "The flexibility and high-level of automation provided to us by this SD-WAN 2.0 platform from Nuage Networks has unlocked new business opportunities and enabled us to rapidly launch new and highly differentiated network and security services. Working closely with Nuage Networks has helped us to adapt this advanced platform for the SME market." Michel Bouffier, CIO at Banco Multiva (Grupo Financiero Multiva), said: "Along with end-to-end governance and security for our customers, we welcome the versatility of this SD-WAN 2.0 platform which allows us to not only support a hybrid environment in our datacenters, but also extends to our nationwide branch network. This provides us with crucial end-to-end policy-based network automation and security, giving us full visibility on the connectivity conditions of our branches in order to procure an outstanding customer service." Cliff Grossner, Ph.D., senior research director and advisor, cloud and data center research practice of IHS Markit, a global business information provider, said: "The adoption of SD-WAN by enterprise grows rapidly, driven by the desire to connect branch locations and on-premises data centers with workloads placed in cloud service provider data centers and SaaS services. Effectively, enterprises are creating a Multi-cloud ecosystem. Ensuring a high-quality user experience with applications distributed across the multi-cloud makes secure, high-performance adaptive connectivity an imperative. For 2017, the revenue to cloud service providers was over USD160 billion, with revenue over USD375 billion forecast for 2022. 2017 revenue for SD-WAN vendors was USD475 million, and is expected to hit 3.6 billion in 2022, signaling a strong need for secure multi-cloud connectivity. Nuage Networks SD-WAN 2.0 focus on providing a secure virtual

networking fabric for the multi-cloud answers an important market requirement." Brad Casemore, Research VP, IDC, said: "Network challenges are coming to the fore as organizations worldwide embrace multi-cloud as a means of achieving digital-transformation objectives. Indeed, IDC finds that enterprises are thinking more comprehensively and holistically about how their networks will support the full spectrum of multi-cloud - from on-premises datacenters to IaaS and Saas public clouds and out to the branch offices and remote locations that constitute the intelligent edge. With its latest release of the Virtualized Services Platform (VSP) and its vision for SD-WAN 2.0, Nuage Networks addresses the need for secure networking across the multi-cloud landscape." Sunil Khandekar, founder and CEO of Nuage Networks, said: "The industry is on the cusp of a big shift towards SD-WAN. Today, Nuage solidifies its SD-WAN 2.0 leadership, adding key features to improve the security and manageability of VNS, and further reinforces our founding vision to connect enterprise users to their applications without boundaries. Unlike other vendors that either have basic connectivity solutions, use proprietary hardware or need to cobble together multiple platforms to address enterprise IT needs, we purposefully developed our VNS offer on a single platform to give our customers a powerful, seamless and consistent set of capabilities across the entire network. By offering IT services over SD-WAN and combining them with Nuage's core strengths in large scale networking and operational capabilities, Nuage Networks VNS establishes itself as the industry's first and foremost SD-WAN 2.0 platform."

About Nuage SD-WAN 2.0

Nuage Networks SD-WAN 2.0 addresses the modern enterprise network's need to connect users to applications in a secure, programmable, automated and transport-agnostic manner. It's the only SD-WAN platform in the industry to offer true end-to-end policy and data plane controls extending from users in branches to workloads in public or private clouds, as well as SaaS. Beyond point security functions, Nuage Networks SD-WAN also offers the industry's most comprehensive security across the entire network with the ability to not only offer end-to-end micro segmentation, but also detect threats and respond in real-time. This unique functionality protects against malicious unauthorized access, monitors all network communication across and within a branch to identify anomalies and violations of policies, generates automated actions by creating security rules in real-time based on real-time events and patterns. To address the massive migration to virtualizing peripheral applications (e.g. VoIP gateways, IoT agents, and Wireless LAN controllers) through the deployment of third-party virtual network functions (VNFs), Nuage Networks SD-WAN 2.0 provides enterprises flexible infrastructure to deploy value added services, whether locally through hosting 3rd party VNFs on an x86 uCPE or service-chained in the datacenter or cloud, ending the complexity of installing and remotely managing dedicated purpose-built customer premises equipment or single-function appliances.

Nokia and Altran Introduce Joint Solution to Streamline Train Maintenance for Railways

Nokia and Altran, a global leader in Engineering and R&D services (ER&D), are launching a jointly developed solution to optimize and streamline the maintenance of rolling stock for railway operators. This solution combines Nokia's strengths in Internet of Things (IoT), networking and analytics with Altran's strength in application development, analytics and system integration for railway operations. Maintenance represents the biggest single operational cost for railway operators, constituting roughly 50 percent of their total operational expense. The maintenance applications railway operators have historically relied on are designed to support rolling stock only from individual manufacturers, making maintenance of their assets cumbersome and costly. The joint solution from Altran and Nokia is designed to provide predictive maintenance support for rolling stock from all manufacturers, dramatically reducing maintenance overhead for railway operators. The solution incorporates smart sensors to monitor and gather data on the condition and performance of rolling stock, the wireless network and IoT connections to aggregate and transmit data. It's a scalable, adaptive IoT platform to manage the wide variety of sensors and other devices required, and an advanced analytics engine to interpret data and recommend preventative maintenance measures. Together, these capabilities can deliver up to a 30-percent improvement in train reliability, a 20-percent reduction in delays and cancellations and a 10-percent reduction in maintenance man-hours. This agreement builds on Nokia's strong track-record providing mission-critical networks to railway operators. It also highlights the progress of Nokia's strategy of expanding its customer base outside of the traditional telecommunications sphere, a key focus of the company's diversification efforts. Jochen Apel, global transportation segment leader at Nokia, said: "Unexpected failures in rolling stock have a huge impact on the operational performance of rail operators. The traditional way of overcoming this is to perform heavy preventative maintenance. The revolutionary approach the Nokia and Altran are taking can greatly reduce this effort and deliver significant cost savings to railway operators." Mike Greenan, Rail & Transport Global Industry Director at Altran, said: "Predictive maintenance is an opportunity for new and for legacy trains. The combination of Nokia and Altran can help introduce and take advantage of modern technologies to increase the operational performance of the train."

Nokia and France Télévisions Show How 5G Can Enhance Viewers' Video Experiences

Nokia and France Télévisions, the French National Public TV broadcaster, are to showcase the results of a proof-of-concept demonstration of the world's first 8K Ultra High Definition (UHD) TV streaming in real conditions over 5G at IBC 2018. Nokia and France Télévisions' 'Innovation and Prospective department' conducted the tests by transmitting a program recorded in 8K over a 5G wireless network at the Nokia Paris-Saclay Campus in France in July. The 5G network leveraged the Nokia AirScale radio access and AirFrame data center solution with the Velocix Content Delivery Network, which enables the delivery of high-volumes of video traffic in a cost-effective way, for an enhanced live or on-demand video experience. Bell Labs Consulting forecasts that, by 2025, video content will comprise approximately 70 percent of all mobile traffic. The Nokia and France Télévisions demonstration showed the ability of 5G to offer a speed equivalent to fiber, with unmatched quality of service to support the future broadcast of 8K content on any compatible device, including 8K televisions. At IBC 2018, Nokia and France Télévisions will present the tests and discuss the findings. Nokia will also demonstrate the new service opportunities that 5G will open up for the media industry beyond pure connectivity. As an example, the company will show how 5G will allow TV editorial staff to offer flexible and ultra-high-quality live television transmission to field reporters without the need for costly broadcasting trucks. Bernard Fontaine, Head of Technical Innovations at France Télévisions said, "The growth in the use of digital devices and the incredible quality increase of equipment are contributing to the increased consumption of our media content. This evolution will require a rethinking of the value chain of actors and technologies that contribute to the future needs of wireless transmission modes. Whether usage targets fixed TV or mobile devices, 5G will be part of the process of convergence and transformation of future technical, regulatory and economic models to ensure a very high level of quality in TV services, including public service ones, over the long term. Our demo with Nokia clearly shows that we are ready for the changes that will sweep our industry with the advent of 5G in the next decade." Marc Rouanne, president of Mobile Networks at Nokia, said, "5G is coming faster than anyone anticipated and we are ready for it. 5G will create new opportunities beyond pure connectivity. Nokia is delivering an end-to-end 5G Future X solution that will provide the flexibility, capacity, speeds and latency for TV broadcasters and telecom operators to support ultra-high quality live reporting and 8K high definition content delivered to consumers' mobile devices and televisions." Taking place between September 13-18, 2018 in Amsterdam, IBC2018 is the world's most influential media, entertainment and technology show. This year's event includes 1,700 exhibitors and 400+ speakers who will address an audience strength of close to 60,000 delegates.

Nokia Board of Directors Resolved to Issue Shares to the Company and Resolved on a Directed Share Issuance to Nokia Employees

Nokia announced that it has resolved to issue 4 014 000 new shares in a directed issuance without consideration to Nokia Corporation to be later used to fulfil the company's obligations primarily under the Employee Share Purchase Plan 2017. The new shares will be registered with the Finnish Trade Register as soon as practicable and the shares will carry the shareholder rights attached to them as of the registration date. Additionally, the Board of Directors resolved on a directed issuance of a maximum number of 4 014 000 Nokia shares (NOKIA) held by the company, as a result of the above issuance of new shares, to employees participating in the Employee Share Purchase Plan 2017. The savings period of the plan ended on June 30, 2018. Under the terms and conditions of the plan, Nokia will offer one matching share for every two shares purchased under the plan which the participant still held on July 31, 2018. The shares under the Employee Share Purchase Plan 2017 will be delivered to the employees on or around September 17, 2018. The shares are issued without consideration. The Board of Directors approved the launch of the Employee Share Purchase Plan 2017 as part of the Nokia Equity Program announced on February 2, 2017 to encourage employee share ownership, commitment and engagement. Both resolutions to issue shares are based on the authorization granted to the Board of Directors by the Annual General Meeting on May 30, 2018.

Verizon & Nokia Claims First 5G NR Data Transmission on a Commercial Network

Verizon and Nokia have completed the first over-the-air, end-to-end 5G NR data transmission on a commercial 3GPP 5G New Radio (NR) network, the companies announced. The transmission went via commercially deployed Nokia radio equipment and Verizon's 5G network core and millimeter wave spectrum to a Nokia test van parked in the downtown area of Washington, D.C. Verizon and Nokia said that the transmission was another of their ongoing demonstrations of 5G NR technology. They expect to launch commercial 5G mobile service in 2019. In June, the two companies completed a series of outdoor data sessions over the 5G NR standard, and used multi-carrier aggregation to boost those signals into the gigabit-per-second range. Last month, Verizon and Nokia said they completed the first successful transmission of a 3GPP NR 5G signal to a receiver in a moving vehicle. "The cadence and frequency of these significant milestone achievements from Verizon and Nokia show just how quickly we're taking the promise of 5G technology from the lab to the field and to the marketplace where our customers will ultimately use this revolutionary technology," said Bill Stone, Verizon vice president, technology development and planning, in a prepared statement. "We said Verizon will be first to 5G, and our latest milestone moves us closer to fulfilling that promise." "Nokia and Verizon have had a tremendous summer for 5G innovations and technology advancements," said Marc Rouanne, Nokia president mobile networks, in a prepared statement. "We are thrilled to be on the forefront of this new technology, helping Verizon make yet another significant stride towards becoming the first-mover to the market." Verizon earlier announced it would launch 5G residential broadband service in Los Angeles, Sacramento, Houston and Indianapolis, in the second half of this year, to be followed by a mobile 5G solution.

Nokia and Sprint First to Demonstrate in the U.S. a 5G NR Connection over Massive MIMO

Nokia and Sprint will show the first live demonstration in the U.S. of a 5G New Radio (NR) connection over a dual mode-capable Massive MIMO radio, bringing this revolutionary technology one step closer to reality. Shown at Sprint's booth (#S1702) during Mobile World Congress Americas, the companies will use Sprint's 2.5 GHz spectrum, Nokia's commercial AirScale Base Station and Massive MIMO Active Antenna, and a VIAVI TM500 5G test device emulator. The demonstration highlights Sprint's approach using its 2.5 GHz spectrum and game-changing Massive MIMO technology to deploy mobile 5G in the first half of 2019. This first in the U.S. live 5G NR system connection using a Massive MIMO Active Antenna can support up to 120 MHz of spectrum in 2.5 GHz. The Nokia AirScale Massive MIMO Active Antenna is expected to deliver up to 3 Gbps peak downlink throughput for a single sector over 5G and LTE simultaneously using Sprint's spectrum. This enables Sprint to offer both 4G LTE and 5G on the same radio to continue meeting its customers' demand for unlimited data and high-bandwidth applications. 5G will enable a great experience using 4K and 8K video streaming, and applications such as HD Virtual Reality. Dr. John Saw, Chief Technology Officer, Sprint, said: "Sprint has long collaborated with Nokia on its Massive MIMO and 5G innovations, and we're excited by this first live 5G NR system connection to help us bring mobile 5G to the U.S. market in the first half of 2019. Because of our large spectrum holdings Sprint is one of the only operators in the world with enough capacity to operate LTE and 5G simultaneously using Massive MIMO and huge licensed channels of 100 MHz of spectrum on the same radios." Marc Rouanne, President of Mobile Networks, Nokia, said: "This joint 5G NR demonstration using Nokia's Massive MIMO technology is another proof point of our innovative work with Sprint as part of their Next-Gen Network strategy. The significant cell capacity Massive MIMO offers is why the technology is playing a central role in 5G, which will allow Sprint to provide increased coverage, reliability and speed across its nationwide network." Massive MIMO, invented by Nokia Bell Labs, will be on display with the live 5G NR connection demonstration. Nokia and Sprint will also be showcasing other 5G demonstrations at Sprint's booth, including low latency use cases for public safety and car platooning, and an Augmented Reality demo for Enterprise.

Oman Broadband Signs Financing Agreement

Oman Broadband Co, signed a RO92mn financing agreement with Asian Infrastructure Investment Bank (AIIB) to invest in infrastructure and finance its projects. The agreement was signed by

Said bin Hamdoon al Harthy, undersecretary for ports and maritime affairs at the Ministry of Transport and Communications and chairman of the board of directors of Oman Broadband. The signing ceremony was organized under the auspices of Dr Ahmed bin Mohammed al Futaisi, Minister of Transport and Communications. Said Al Mandhari, chief executive officer of Oman Broadband, said that the agreement with AIIB seeks to provide high-speed communications services through the implementation of fiber optic network expansion projects. "It is also one of the most important stages of the company, which will be able through it to rely on external funding in the coming projects and without any government guarantees." Said Al Mandhari said that the loan will be used to finance the capital projects of the company to be completed by 2021 within the first phase of the implementation of the National Broadband Strategy. The signing ceremony was attended by a number of undersecretaries and chief executive officers of the companies in telecommunications sector.

PCCW Global Launches Managed SD-WAN Service to Enterprises across 80 Countries

PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, has launched a new global Software-Defined Wide Area Network (SD-WAN) service which complements existing fiber-based IP-MPLS services, providing enterprises with a secure, application aware network that continually optimizes for performance and cost in real time, and delivering a vastly improved user experience. As enterprises seek to extract the most value from exciting new technologies such as cloud computing, data analytics and the Internet of Things, heavy demands on branch networks often lead to increasing complexity along with cost and resource-intensive WAN management. PCCW Global's new SD-WAN service addresses these challenges head-on by simplifying multi-site WAN deployment and management. The service optimizes traffic in real time by constantly adapting to meet changing business needs while simultaneously balancing performance and cost. Traffic is intelligently routed over a preferred network path from a combination of IP-MPLS, broadband and 4G LTE connections in order to meet pre-defined network and performance policies. The service is transport agnostic, so enterprises are able to make use of an existing PCCW Global MPLS network, or even connectivity provided by another service provider. SD-WAN is easy for enterprises to deploy and integrate with their current network, resulting in minimal disruptions for end users while providing an integrated and seamless end-to-end user experience. Moreover, customers are able to take control of their own SD-WAN network through a centralized management portal that provides advanced visibility, configuration, reporting and trouble-shooting capabilities. Enabling cost effective access from the branch site to data center, SD-WAN complements PCCW Global's existing Console Connect service, a global Software-Defined Interconnection® platform that provides automated, secure and predictable connectivity between the data center and business partners, major cloud service providers and business-critical applications across the globe. The service also supplements and enhances PCCW Global's comprehensive suite of communication services that includes Global MPLS, Global Internet Access, Global Ethernet, Global UCaaS and Managed Cybersecurity Solutions. Over 80 countries across the US, Asia, Africa, Latin America, the Middle East and Oceania will be covered during the initial launch phase of the service, which will continue to be expanded through both PCCW Global's existing network as well as third party providers' networks. PCCW Global's MPLS network itself spans over 3,000 cities in 150 countries, with direct extensions available to all major cloud providers. Mr. Jordick Wong, Senior Vice President, Product and Vendor Management, PCCW Global, said, "Globally, the need for intelligent and advanced business networks is growing substantially. Our SD-WAN service provides enterprises with an efficient and streamlined networking capability that maximizes their existing connectivity solutions and optimizes business-critical and cloud-based applications, ensuring an enhanced user experience without having to spend more on connectivity."

Infrastructure Projects to Drive Demand for Local Suppliers in the GCC

In the coming 20 years, non-OECD states are projected to spend more than USD57 trillion on infrastructure projects, compared to USD34 trillion by OECD countries, according to a recent study by management consultancy Strategy& Middle East (formerly Booz & Company), part of the PwC network. In conjunction with this spending, policymakers in non-OECD countries have increased their commitment to promote localization of their infrastructure spend. Nearly 300 local content requirements measures are currently in place in non-OECD countries. According to the Strategy& report, such an approach is particularly important for the GCC, where governments are investing significant sums to develop infrastructure. Saudi Arabia, for example, is likely to spend USD1.1 trillion from 2019-2038, while the UAE is scheduled to invest USD350 billion over a similar time frame. These large development schemes can allow local companies not just to substitute imports, but also to grow non-oil exports by enhancing their capabilities. Commenting on the report, Dr. Raed Kombargi, Partner, Strategy& Middle East stated, "The trend toward local content requirements reflects an increasing recognition that the trillions of dollars that governments spend on mining, oil and gas, power, water, and transportation infrastructure could potentially fuel economic growth, create jobs, and support broader national strategies. However, many local-content programs fall short of their objectives because policies are affected by the conceptual biases of policymakers. By understanding and addressing these biases directly, developing countries can ensure that they retain the bulk of the economic gains from the coming wave of infrastructure spending." GCC governments need to think logically about how they balance the need to localize manufacturing while pursuing sound economic policies. There are many capabilities that the region does not possess because of its small size and hence needs to import to build infrastructure. Additionally, policymakers need to stress the importance of economic openness and free trade given the region's need to export. However, many governments have a sense of urgency that, although commendable, can lead to short-sighted and counterproductive policies. The Strategy& Middle East report outlines three key biases that can interfere with robust, fact-based analysis and policy design: False aggregation of demand. Policymakers tend to overestimate the localization potential from a given product category, failing to factor in the huge disparities in sizes, designs, and costs of goods in that category. A fixation on familiar objects. Policymakers tend to focus disproportionately on familiar product categories, such as consumer goods, wind farms, or solar panels, rather than lesser-known goods and industries that hold greater potential to create value. Absolutist target-setting. Policymakers aim for higher percentages of local content without analyzing the underlying economic value created. Some inputs will always be cheaper to import. Dr. Shihab Elborai, Partner, Strategy& Middle East added, "Overcoming these biases will require analytical and behavioral safeguards that complement and reinforce each other. Regarding analytical measures, policymakers need to develop a detailed view of procurement spending, establish a baseline of local supply chain capabilities, and quantify the trade-offs from specific initiatives. As for behavioral measures, policymakers must be aware of biases, encourage dissent and constructive debate, and require adversarial reviews of the policy recommendations." The sourcing of manufactured goods and services from within the local economy continues to play a central role in the industrial policies of a growing number of governments, particularly in developing countries. In Indonesia, for instance, up to 71 percent of electrical power infrastructure spending come from local suppliers, along with as much as 50 percent of expenditure on equipment used in wireless broadband services and base stations. Dr. Yahya Anouti, Principal, Strategy& Middle East, concluded "Policymakers in developing countries are justifiably keen to derive maximum economic value from massive public expenditure. Still, creating a policy framework for local content development that nurtures economically sustainable and internationally competitive domestic industries has proven remarkably challenging. A mounting sense of urgency and public expectations of immediate job creation, national business support, and non-resource-based GDP growth typically drive local content development policies."

Viva Backs eGoverment Forum and IT Expo

Viva Bahrain has been named the Platinum Sponsor of the Bahrain International eGovernment Forum & IT Expo 2018, which is scheduled to take place on October 7 and 8. Noting this partnership, Viva Bahrain CEO Engineer Ulaiyan AlWetaid said: "Viva is delighted with such an opportunity, which goes in line with its vision that aims at creating positive national development by building a knowledge-based society and participation in community development programs." "Viva's sponsorship reflects its commitment in investing within the ICT sector along with facilitating the exchange of concepts and experiences in this field," he said. Held under the patronage of HH Shaikh Mohammed bin Mubarak Al Khalifa - Deputy Prime Minister, Chairman of the Supreme Committee for Information and Communication Technology, this year's forum will bring together over 20 local, regional and international elite speakers who will be participating to share their views, experiences and future thoughts within the ICT arena. The authority urges all concerned in the ICT sector to participate and register at the forum.

Yahsat, Hughes Form JV to Deliver Satellite Broadband

Yahsat, a leading global satellite operator based in the UAE and wholly owned by Mubadala Investment Company, and Hughes Network Systems, a subsidiary of EchoStar Corporation announced an agreement to enter into a joint venture to provide commercial Ka-band satellite broadband services across Africa, the Middle East and southwest Asia. This new venture combines Hughes deep expertise as the global leader in broadband satellite networks and services with Yahsat's unique position and knowledge as the leader in satellite broadband solutions across these regions. Hughes will purchase a minority interest in the venture. The new venture will continue to provide unserved and underserved communities with reliable, high-speed Internet services operating over Yahsat's Al Yah 2 (AY2) and Al Yah 3 (AY3) Ka-band satellites, and leveraging the capabilities of the Hughes Jupiter System, designed and optimised for large scale High-Throughput Satellites (HTS). Hughes will also supply its proven Operating and Business Support System (OSS/BSS) solutions for comprehensive network operations and management. Initially, the venture will focus on "direct-to-premise services" to homes and small- to medium-sized enterprises, and to community centers and schools that are served under local government programmes across these regions. In parallel, there will be an increased focus on "community hotspot" solutions to make satellite-enabled broadband more accessible to many more users across the AY2 and AY3 footprint, which currently covers more than 1 billion people. Masood M Sharif Mahmood, chief executive officer, Yahsat said: "The partnership with Hughes plays a significant role in Yahsat's growth story and serves as an important step in achieving our vision to providing global satellite broadband services to individuals, communities, governments and businesses in unserved and underserved communities. Yahsat's remarkable track record and experience in operating YahClick, combined with Hughes technology leadership and experience, are a winning proposition to unlock the mass market potential of satellite broadband services across the region. I am very pleased to see our longstanding partnership with Hughes as a supplier over the years now advance to this strategic and very important joint venture for Yahsat." Pradman Kaul, president of Hughes, said: "Yahsat has been a valued customer for many years, incorporating our Jupiter System and operating expertise into their services. This next step in our relationship is a natural evolution that builds on our shared commitment to connecting the unconnected and reflects our strategy to partner with leading providers around the world. Our investment in this venture will expand our presence in Africa, the Middle East and southwest Asia markets, where broadband demand is expected to grow exponentially in the coming years." Completion of the transaction is subject to customary regulatory approvals and closing conditions, and is expected to occur later this year, the statement said.

Yahsat Launches Satellite Broadband Service in Ghana

Yahsat, the UAE-based satellite operator, officially launched its broadband satellite service, YahClick, in Ghana. The launch announcement came during a press conference held at the Marriot Accra Hotel, where Yahsat's partnership with regional broadcast and Internet service providers Comsys and Teledata was also announced. With the introduction of YahClick, Yahsat, along with Service Partners Comsys and Teledata, intend to provide Ghana with reliable, cost-effective, high-performance Internet that promises to usher in a new age of high-speed connectivity that enables economic and social progress. Sub-Saharan Africa has suffered substantial economic losses in recent years due to frequent Internet breakdowns that directly affect fixed, wireless, and mobile Internet connectivity. Here in Ghana, reports suggest each communication disruption costs the country approximately USD6.3m a day, with disruptions expected to total 22 days in 2018*. The addition of Yahsat's technology to Ghana's digital landscape, is set to change this. Using the Ka-band powered by High Throughput Satellite (HTS) spot beam technology, YahClick's services will enable communities, businesses and the government to unlock their full potential and achieve the level of social and economic development the nation deserves. Key verticals expected to reap the benefits of YahClick include banking and finance, mining and oil and gas. In addition to supporting these key industries, the service is also expected to benefit government supported initiatives especially in education and healthcare. "The driving force behind the launch of YahClick in Ghana is our desire to serve the country's specific connectivity needs and deliver high-performance, customized satellite broadband solutions to its businesses and communities." commented Farhad Khan, Chief Commercial Officer, Yahsat. "Today, YahClick is recognized as the leading satellite broadband service in Africa thanks to its reliability and coverage, alongside the local expertise and quality of customer service provided by our trusted service partners such as Comsys and Teledata here in Ghana." Added Khan. Both Comsys and Teledata are leaders in Ghana's telecommunications sector, and possess a solid record of delivering innovative communication solutions to a wide range of industries, NGOs, government entities, and communities. CEO Greg Eid of Teledata ICT added: "We believe that YahClick services will not only successfully meet our customers' needs, but also open up new business opportunities across various industries. We look forward to working with YahClick to ensure that our customers in Ghana, access uninterrupted and high-speed-Internet that is critical to their growth." Comysy Ghana Business Development Manager, Kobi Ahon commented: "Our goal has always been to lead in innovative solutions to tomorrow's communication challenges in Ghana. By introducing Yahclick's game changing technology to Ghana, we are able to reach the most remote locations with internet connectivity through best-in-class satellite broadband services" Yahsat launched its flagship service, YahClick, in Africa in 2012. It was the first operator to introduce HTS Ka-Band satellite broadband technology to the continent through Yahsat's Al Yah 2 satellite. Following the successful launch earlier this year, and the recent commercial readiness of the company's third satellite Al yah 3, YahClick's footprint has extended to 19 additional markets in Africa, including Ghana. The expansion is part of Yahsat's commitment to deliver affordable, reliable and high-speed Internet connectivity to unserved and underserved parts of the world.

Yahsat Launches Satellite Broadband Service in Ivory Coast

Yahsat launched its satellite broadband service in Ivory Coast in a bid to boost internet access in this west African nation where only 27 percent of the population is online. Named YahClick, the service offers broadband internet connectivity to businesses, government agencies and remote areas of the country. "This broadband satellite service promises to improve telecommunication capacities across the country which until now have been very weak," Yahsat's Africa manager Yannick Kashila told AFP. In Ivory Coast, the leading economy in French-speaking West Africa, internet penetration remains stagnant at only 27 percent. In rural areas, only 2.0 percent of homes have access, compared with 16 percent in urban areas. "Today in 2018, having good internet connectivity has a direct influence on the economic development of a developing nation," said Morris Michael Kofi, head of Cee-Net Technologies, which supplies internet technologies and is partnering with Yahsat. "A 10-percent increase of broadband connectivity can have a positive impact equating to around 1.4 percent of GDP in a developing country," he told AFP. Mobile telephony currently accounts for around 8.0 percent of Ivory Coast's GDP and the sector is one of the country's biggest employers. The daily volume of financial transactions conducted over mobile networks -- payments or money transfers -- in Ivory Coast equates to some 15 billion CFA francs (23 million euros/USD29,000,000). There are three operators dominating the mobile market in Ivory Coast: France Telecom's Orange, South Africa's MTN and the Ivorian-Saudi group Moov. YahSat, which is based in the United Arab Emirates, is a satellite operator targeting markets in the Middle East, Africa, central and southwest Asia and Europe. It is owned by the Emirati investment fund Mubadala.

Nokia 5G Future X

Unleashing the potential of 5G

NOKIA

ARTICLE

Nokia NetGuard Endpoint Security is for Fixed, Mobile and IoT Devices Protecting Billions of Subscribers in the Middle East and Worldwide

Henrique Vale
Head of Nokia Software for MEA
Nokia

The most attractive telcos targets include user equipment, access networks, high-value data as well as mobile core and IP networks. The traditional mitigation approach is largely based on manual processes without a centralized management system. This is still a reasonable approach for some organizations, but the increasing sophistication of attacks and growing regulatory complexity mean this will not be a tenable approach in the medium term.

An expanded security management solution with security orchestration, analytics, and response (SOAR) would support workflow management, automation and reporting. This would enable security operations teams to automate and prioritize activities and report data to inform better business decision making.

Recent attacks that have had a global impact are a warning call for users, corporations, and governments alike. Yet, with the kinds of security management systems I've described, they could have been prevented. It's time to act before further damage is caused.

What gives end-users/customers the confidence in an operator's network in terms of security?

There are many layers at work to provide the end user with high degree of trust. For example, there are endpoint security solution that can identify malware behaviors when they are trying to attack equipment or other users in the network, by identifying these behaviors, malicious communication between the affected device and the service can be isolated. Using machine learning to recognize the communication patterns of viruses and threats, it is possible to perform behavioral analytics for threat and anomaly detection. Identifying anomalies can help flag connections, isolate devices, app/services, identify sources of threats and ultimately help increase the level of trust at the customers and network communication level before data breach occurred.

The new 5G architecture itself introduces new types of security threats and an increased attack surface. The potential for dynamic configurations in 5G requires new, dynamic and flexible security architectures. 5G network slices must be appropriately secured for different use cases, and as a result, telcos must focus on measurable security management and assurance.

So, it's vital to secure the network to gain subscribers' trust with a robust endpoint security solution such as Nokia's Nokia NetGuard Endpoint Security, which is a network-based anti-malware solution for fixed, mobile and IoT devices. This solution has been protecting billions of subscribers across the globe and Middle East and Africa as a number of leading telecom operators across the region has deployed this. For example, Zain Saudi, among other key operators, deployed this to monitor and analyze mobile network activity in Jeddah and Makkah and protected millions of subscribers from malware threats to online transactions and mobile applications.

With 5G technology expected to increase the number of applications in IoT and smart city areas, can we also expect increased security threat?

Yes, 5G technology will bring a range of new use cases and applications, and associated network security threat. To support each use case in an optimal way, security capabilities will need to be more flexible. For example, security mechanisms used for ultra-low latency, mission-critical applications may not be suitable for massive Internet of Things (IoT) deployments where mobile devices are inexpensive sensors that have a very limited energy budget and transmit data only occasionally.

Another driver for 5G security is the changing ecosystem. LTE networks are dominated by large monolithic deployments—each controlled by a single network operator that owns the network infrastructure while also providing all network services. In contrast, 5G networks may be deployed by a number of specialized stakeholders providing end-user 5G network services.

The new 5G architecture itself introduces new types of security threats and an increased attack surface. The potential for dynamic configurations in 5G requires new, dynamic and flexible security architectures. 5G network slices must be appropriately secured for different use cases, and as a result, telcos must focus on measurable security management and assurance.

Network security solutions must adapt to this new 5G architecture. To support the dynamic network requirements of 5G, firewalls must not only be virtualized. They must also be cloud-native to meet the performance demands of virtual networks and to support other requirements, such as elastic scaling. A holistic view of the entire mobile transport network and client nodes is necessary so that network operators can apply sufficient security measures, with optimal network placement and design.

Security Analytics correlates data from across the network, devices and cloud layers to spot suspicious anomalies and provide insight into the nature of the threat, the associated business risk and recommended response.

What do the telcos need to do protect their networks?

The answer is to replace today's manually-intensive approaches with security management systems built on three pillars - security analytics, machine learning and automation, as reflected in Nokia's security solution.

Security Analytics correlates data from across the network, devices and cloud layers to spot suspicious anomalies and provide insight into the nature of the threat, the associated business risk and recommended response. In our example of a device functioning correctly but leaking data, security analytics could spot trouble by detecting CPU activity spikes or unusual levels of keep-alive signaling. With Machine Learning, the effectiveness to identify communication patterns of viruses and threats would increase continuously.

Security Automation is essential. There is a global shortage of cybersecurity experts that is forecast to grow to around two million unfulfilled jobs by 2019. Furthermore, current approaches are inefficient, with up to 33 percent of incident response time spent on manual processes, leading to delays. Combined with alert fatigue and time wasted on false alerts, many security breaches can go undetected. Security automation that encompasses business processes, regulations and security policies will be essential to keep pace with the rapid rise in attacks that will inevitably accompany the growth in IoT.

REGIONAL NEWS

5G-IoT to Bring USD3.3 Billion Opportunities to UAE Telcos

Telecom operators in the UAE stand to gain an additional USD3.3 billion (Dh12.1bn) in revenues by 2026, with manufacturing presenting the biggest opportunity, according to a report from Swedish telecommunications company Ericsson. "Digital transformation is taking place in almost every industry, disrupting and creating new business models, and 5G is an enabler of this transformation," said Rafiah Ibrahim, head of Ericsson Middle East and Africa. Expanded mobile platforms developed by technology and telecom companies in the region are already enabling service providers to capture opportunities from digitalization, "while addressing the explosive traffic growth expected in the 5G evolution", he added. 5G is the name used to describe the fifth generation of cellular mobile communications, which is poised to transform data capture, underpinning the Internet of Things - a catch-all term for products and services connected to the web to capture and share data - by connecting at a much faster rate. The technology will enable digitalization of 10 industries in particular - agriculture, manufacturing, energy and utilities, public safety, health care, public transport, media and entertainment, automotive, financial services and retail – Ericsson said in its "guide to capturing the 5G industry digitalization business potential" study. This will generate USD619bn of revenues by 2026, led by the manufacturing sector which will account for USD113bn of global revenues from digitalization, and energy and utilities with USD101bn. In the UAE, industry growth potential is also driven by the digitalization of manufacturing, which is expected to contribute 18 per cent of potential revenues by 2026. This is followed by energy and utilities with 16 per cent and public safety with 12.5 per cent, according to Ericsson. UAE mobile operators will see the most revenue potential from real-time automation, which offers a potential USD530 million of additional revenues by 2026 as automated services like mobile messaging and user data analytics is adopted at a rate of 133 per cent per year between 2020 and 2024 and will continue to rise steadily after that, the report said. Other revenue potential will come from enhanced video services, bringing in USD510m, and monitoring and tracking with USD380m.

Saudi Arabia Launches Digital Giving Initiative to Spread Digital Awareness in Arab societies

Saudi Arabia plans to launch a huge initiative called "Digital Giving" to spread digital knowledge in Arab societies around the world in light of the huge technological development that is taking place in the world and the increasing need for technology which has become vital to everyday life. The initiative, which will be launched soon under the auspices of the Ministry of Communications and Information Technology, aims to enrich Arabic technical content through a number of innovative means and creative tools. Technical experts, specialists, and amateurs from all around the world will contribute to the initiative. The ministry announced that all preparations for the launch of this initiative have been completed, and that it aims to enhance the digital capabilities of members of society by spreading the culture of giving, helping to train and educate people on digital content and the most important technical knowledge, support the non-profit sector in developing technical skills, and accelerating digital transformation in the operations of its institutions. The "Digital Giving" initiative is especially important for its role in motivating those who are digitally literate to spread knowledge to all members of the community, highlight distinctive technical qualities and models, and enabling society to benefit from technology that would help everyday tasks. All specialists and those interested in technology, members of the non-profit sector, and all members of the community can participate in the "Digital Giving" initiative through the following link: http://attaa.sa

Pakistan is All Set to Launch 5G Services Next Year

Minister for Information Technology and Telecommunications, Dr. Khalid Maqbool Siddiqui on Tuesday pointed at introducing 5G (5th Generation) service next year and it would attract a huge foreign investment. After the rapid success of 3G and 4G cellular services, 5G services in Pakistan are coming next year. He said in an exclusive talk with APP after planting a sapling here at National Telecommunication Corporation (NTC) Headquarters. "We need to introduce more innovative services in the mobile broadband arena not only to facilitate consumers but also to attract precious foreign investment and meet modern requirements," Dr. Khalid Maqbool planted for Pakistan campaign at NTC under which 5,000 plants will be planted and it will bring a huge change in the country. Managing Director NTC Brig (r) Viqar Rashid Khan and other senior officers of NTC were also present on the occasion. Replying to a question, the Minister said, "The world is changing very swiftly and to compete with other nations we need to adopt new technologies." When asked about priorities of the new government, he said, "We will take with all good initiatives taken by previous regimes while shortcomings would also be addressed. Our basic objective is to produce results which should be beneficial both for players and consumers." "We will start new projects that were supposed to be initiated by the previous governments," he said, regretting that the country can attract more investments in case IT sector has been effectively focused. "It is our responsibility to ensure transparency in all ministries and departments and also enhance the capacity of department working under ministry of Information Technology and Telecommunication," he added. It will be a huge change if 5G services in Pakistan launches next year. The 3G/4G subscribers in Pakistan are around 56 million with 75% teledensity. It shows that the Balochistan areas are still not covered with 4G access Furthermore the 46% users in Balochistan has no access to mobile or any landline facility.

Oman is Number 3 Globally in Mobile Penetration Rate

With 6.944mn mobile subscribers at end of 2017 in Oman, the sultanate averaged 1.5 mobile phones per person and a penetration rate of 152.3 per cent which is among the highest in the world. According to Statista, a research and information design company based in Hamburg, Germany, the UAE has the highest mobile penetration rate in the world (173 per cent), followed by Greece (171 per cent). Oman is third on the list, followed by Portugal and Estonia (148 per cent). There were 78,000 more mobile subscriptions in Oman at end of 2017 compared to the previous year, according to Telecom Regulatory Authority's (TRA) 2017 Annual Report. 'The mobile penetration rate per inhabitant increased to 152.3 per cent in 2017 compared to 151 per cent at end of 2016. Prepaid mobile connections represent 90.63 per cent of the total mobile subscriptions with 6.293mn subscriptions. The number of postpaid mobile subscriptions was 651,000 at end of 2017,' the TRA stated. The year 2017 ended with 509,756 fixed telephone lines, a growth of 21 per cent over the previous year. The fixed line household penetration rate increased as well from 73 per cent in 2016 to 87 per cent in 2017. More than half (54 per cent) of the total fixed lines are within Muscat, followed by North Batinah, while Al Wusta has the lowest percentage of subscriptions. Residential accounts make up 73 per cent and business 27 per cent of the total fixed lines. There were 351,335 fixed Internet connections in 2017, an increase of 30 per cent against the previous year, while the fixed Internet subscription penetration in households increased by 13 per cent to reach 60.1 per cent by end of year 2017. Fixed broadband subscriptions including DSL, fixed wireless, FTTH, Internet leased lines and others, grew by 30.7 per cent (348,924) in 2017 over the previous year (266,983). Fixed broadband penetration per household increased to 59.7 per cent by the end of year 2017. With smartphones becoming ubiquitous, active mobile broadband subscriptions in Oman increased to 4.352mn in 2017, while mobile broadband penetration per inhabitant increased to 95.4 per cent. In terms of market share, Ooredoo had 43 per cent subscriptions, while Omantel and other resellers take up 42 and 15 per cent of the pie respectively. As mobile broadband uptake continues to increase, the technology seems to be the source of the major part of the revenue. According to TRA, 70 per cent of the telecom revenue is from mobile services, 29 per cent from fixed line services, and the remaining one per cent is from other telecom services. The average revenue per mobile subscription was RO7.2 in 2017, while it was RO27.1 for each fixed Internet subscription and RO4.1 per fixed telephone subscription.

Smart Dubai Launches Blockchain-Based Payment System

The Smart Dubai Office (SDO) has launched the 'Payment Reconciliation and Settlement' System, developed in collaboration with the Dubai Department of Finance as a Blockchain-powered upgrade to its financial system. The new system introduces Blockchain technology into the Department's processes, allowing transactions to be performed accurately and in real time and economizing time and effort. The Department of Finance's current procedures rely on having staff members physically go through payments collected from various portals to manually reconcile and settle them, deducting the fees due to the Department and then transferring the remaining amounts to the relevant Authority – a time-consuming process that could take up to 45 days. "Smart technologies continue to infiltrate every aspect of human life and societies; virtually everything we do today relies fully or to some degree on an advanced technology once considered 'disruptive'," said Dr Aisha Bint Butti Bin Bishr, director general of the Smart Dubai Office (SDO). "Guided by the forward-thinking vision of its leadership, Dubai has long been a trailblazer in embracing avant-garde technologies – most notably those of the Fourth Industrial Revolution – and tailoring them to meet the needs of our citizens, residents and visitors, in a bid to transform Dubai into the happiest and smartest city in the world." "Blockchain is one of the most promising of these technologies, attracting more investments every year," Dr Aisha added. "Once again, Dubai was a pioneer in this sector and continues to make progress with the launch of the 'Payment Reconciliation and Settlement' System, which falls in line with the ambitious Dubai Blockchain Strategy, launched by Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and chairman of the Dubai Executive Council. The Strategy seeks to increase government efficiency by transferring 100 per cent of government transactions to the Blockchain network." "Ensuring the success of the 'Payment Reconciliation and Settlement' system requires fostering collaboration and synergy among the various Government entities that have joined – or are planning to join – the system, considering that it calls for each entity to open its data and work hand-in-hand with other departments from across the Government spectrum," Dr Aisha concluded. Wesam Lootah, CEO of the Smart Dubai Government Establishment (SDG), noted: "We, at Smart Dubai, consider technology to be a means for us to help improve people's quality of life and spread happiness among them. Correctly applied across various key sectors, we believe Blockchain has massive potential to achieve our emirate's ambitions for a fully-fledged smart transformation. In 2018 alone, investment in this game-changing technology surpassed that of all the previous years combined, and analysts project the global Blockchain market to be worth USD290 billion by 2019." "The new and advanced 'Payment Reconciliation and Settlement' System offers Dubai Government entities many significant benefits," Lootah added. "Besides enabling near real-time reconciliations and settlement, the System eliminates friction from financial processes through automation and minimizing human intervention. It allows for clear visibility of funds; immediate disputes and claims resolution; transparency and immutability of financial records." The Dubai Electricity and Water Authority (Dewa)and the Knowledge and Human Development Authority(KHDA) were the first government agencies to join the system; the two entities have already processed a combined total of more than five million transactions using the advanced Blockchain-powered system. In the coming period, more Government entities will be joining the System, most notably: Dubai Police; Roads and Transport Authority (RTA); Dubai Health Authority (DHA); Dubai Airports; Dubai Customs; Dubai Municipality; Department of Tourism and Commerce Marketing (DTCM); Dubai Courts; and Dubai Holding, among other local Government bodies and a number of prominent banks and financial services providers.

DoT to Carry Out Special Audit of Telcos

India's Department of Telecommunications (DoT) is planning a special audit of mobile operators to investigate whether providers have been under-reporting revenue, the Economic Times writes. The audit will span the period from the 2011/12 fiscal year onwards and is looking to account for the downturn in license and spectrum fees in recent years. Calculations for both charges are based on the license holder's turnover, and government returns from the fees fell by more than 23% in 2017 as a result of severe price competition affecting operator's revenues. The paper quotes an unnamed DoT official as saying that 'all telecom companies will be audited … and notices will go out soon,' whilst confirming that Aircel, which is currently in the midst of bankruptcy proceedings, has already received its notice. Operators have expressed concern that the audits will add more pressure to the already-stressed sector. Alongside any additional demands, operators are increasingly concerned with the burden of legal challenges to the DoT's demands. Rajan Matthews, the head of industry body the Cellular Operators Association of India (COAI) was quoted as saying: 'Special audits typically happen when the DoT is not convinced about account reporting and the concern is mainly on the AGR [adjusted gross revenue] calculations that are defined differently. They have every right to audit, but if operators again decide to challenge the new findings, it will lead to more legal cases.' Similarly, a senior executive from one telco added: 'This will be another way for the telecom department to see if they can charge us any other kind of dues. And this is contradictory to DoT's stated claim that it wants to reduce litigation.' Operators claim that the industry has racked up legal fees of nearly INR800 billion (USD11 billion) in the last few years, solely through clashes with the regulator and the government. The audit will be the third such audit carried out by the DoT, following investigations in 2009 and 2016, both of which led to demand notices that were subsequently challenged in the courts. The most recent called for six telcos to hand over a combined total of more than INR120 billion and is still stuck in the courts. A major sticking point in resolving the cases has been the definition of AGR, a matter that is itself the subject of a decade-long legal feud between the government and the industry.

Intracom, COMATEC Deploy IPTV Solution in KSA

Intracom Telecom, a global telecommunication systems and solutions vendor, announced that joined forces with COMATEC in order to deploy an IPTV solution in a luxurious compound in the Kingdom of Saudi Arabia. The deployment is based on Intracom Telecom's award-winning fs|cdn™ Anywhere IPTV & OTT middleware, that enables the delivery of high quality digital video content to TVs & smart connected devices, while the partners' plans include the option to introduce additional interactive services in the near future like network DVR and Restart TV. COMATEC with its engraved and matured experience in both construction and telecom areas, is a modern contractor in the KSA, seeking to materialize new technological opportunities like the IPTV and Over The Top (OTT) content services in the highly growing residential compound and hospitality market. Both COMATEC and Intracom Telecom have agreed to strategically team up to address the hospitality business in the Kingdom of Saudi Arabia and the Middle East region in general. Mr. Rad Marji, the GM of COMATEC, stated: "The list of worldwide successful deployments and expandability of the fs|cdn™ anywhere platform played a key role in the decision-making process. Throughout the process, we also evaluated Intracom Telecom's business agility and their deep technological background and capabilities that perfectly complement our strategy for growth and innovation in the Kingdom." "In Intracom Telecom we are excited with our cooperation with COMATEC" said Mr. Sotiris Bithas, Marketing Director of Telco Software Business Division at Intracom Telecom, while he added that "Our IPTV/OTT platform has been deployed successfully to over 40 Telco & Cable Operators in the USA and Europe. We look forward to taking up the challenge to address together with COMATEC the needs of the digital video content services in the emerging and highly growing market of the Hospitality sector in the KSA."

Tunisia to Host the 29th AFRINIC Public Policy Meeting

Edotco, the tower arm of Malaysia-headquartered Axiata Group, cancelled a planned USD940 million purchase of 13,000 towers from Pakistan Mobile Communications after being unable to obtain the required regulatory approval. In August 2017, edotco announced it would partner with Dawood Hercules to acquire the tower assets of Pakistan Mobile Communications, which operates under the Jazz brand and is the country's largest mobile operator. Under the terms of the deal, Dawood Hercules would have taken a 45 per cent stake, with the remainder held by edotco. In a statement edotco said the transaction had been subject to a number of conditions and was terminated after it didn't get approval for the requested change of control within the stipulated timeframe. The company said it remains committed to Pakistan and will continue to grow its existing business under edotco Pakistan. Edotco CEO Suresh Sidhu said: "We do not foresee this affecting our business goals. We are confident in the potential of the growing market in Pakistan and are committed to the existing operations there." Arif Hussain, country MD for edotco Pakistan, added: "We have seen strong progress in Pakistan since our first acquisition, and business continues to grow with new orders for sites as well as high demand for adjacent opportunities such as energy solutions. We remain focused on building the business in Pakistan." In June edotco picked up 700 towers in Pakistan when it acquired Tanzanite Tower, a subsidiary of Tower Share.

PTCL Rolls out LTE Upgrade, Switches off CDMA System in Major Cities

State-owned telco Pakistan Telecommunication Company Limited (PTCL) has implemented a 'major upgrade' of its fixed-wireless TD-LTE network – marketed by the telco as CharJi 4G LTE – in Karachi, Islamabad, Rawalpindi and Peshawar. As part of the development, however, its legacy '3G EVO' service, which uses CDMA200 1xEV-DO Rev A technology, will no longer be available in those cities from 17 September 2018. EVO customers are able to upgrade to CharJi by trading in their old device and paying an additional PKR2,500 (USD20.2), users doing so will also receive one month of unlimited free downloads. As noted by TeleGeography's GlobalComms Database, PTCL launched its CharJi LTE network in September 2014 on the 1900MHz band and announced in March this year that it was working to gradually replace the aging CDMA-based EVO system – which also uses 1900MHz band frequencies – with TD-LTE technology.

Dubai to Launch New Digital Competitiveness Platform

The Dubai Competitiveness Office (DCO) in Dubai's Department of Economic Development (DED) has announced plans to launch 'The Future of Competitiveness Platform,' which will track global data and indicators on competitiveness, and help benchmark the emirate's competitiveness to support decision-making in local public and private sectors. Set to be launched in the second half of 2019, the digital platform will consolidate all data on competitiveness into a single repository where the most relevant reports and indicators will be easily accessible to the government and private sector. The platform will be an integral component of the DCO strategy to build a unique and consistent environment for tracking and managing the competitiveness factors across Dubai, thus supporting the leadership in identifying policies and programmes that would firmly position Dubai on the global map. "The launch of the digital platform is part of our strategy to promote business competitiveness and sustainable economic growth in Dubai," said Hani Al Hamli, DCO secretary-general. "Tracking international competitiveness data and indicators will enable Dubai to use such knowledge in drawing up future plans and developing growth strategies in the short and medium term as well as in building partnerships with stakeholders. Decisions will thus become prompt and precise, eventually leading to greater satisfaction for the services available and overall customer happiness," he added. The platform will rely on six key international indices on the economy and the competitiveness of Dubai in comparison to the rest of the world. The six indicators are related to Dubai's competitiveness as per the framework and methodology of the World Competitiveness Centre; the global competitiveness of cities; the Global Talent Report; the Global Innovation Index for Cities, and the Ease of Doing Business index, in addition to other global indices related to the vision and strategies of Dubai and the UAE. The development of the platform will include four main phases and varied procedures, including defining uses and functionalities; design and data research; developing concepts and showcasing them for the National Agenda; further concept and design iterations, and full design and development of the platform. "The Future of Competitiveness Platform will be a dynamic system where data will be periodically and continuously updated to display reliable information in a sophisticated, yet simplified format. It will include a series of tools to track the competitiveness indicators and use available data for benchmarking and research," Al Hamli added. The DCO seeks to demonstrate Dubai's economic and social capabilities through studies, strategies, systems and policies that keep abreast of global best practice and contribute to creating an internationally competitive investment environment that promotes economic activity, prosperity and sustainable development in Dubai.

Egypt to Activate e-Payment in Government Portal

Egypt's Minister of Planning, Follow-up and Administrative Reform Hala al-Saeed said the fourth edition of the government portal will be launched in December of 2018 to activate the use of electric payment cards. The move comes as part of the ministry's plan to activate electronic payment of government services through the Egyptian government portal, the minister said during the signing ceremony of a cooperation agreement between the Researches and Economic Studies Centre at Cairo University's Faculty of Economics and Political Science and the Arab Economic Unity Council in the domain of digital transition. The world is now witnessing rapid changes in the information technology domain with the emergence of a new economy known as digital economy, she said. But the digital economy in Arab countries face many challenges, especially weak infrastructure, lack of confidence in electronic dealings and the high cost of internet, she added. Saeed said the agreement aims at promoting awareness of digital economy and holding workshops to develop bills aiming at activating the digital economy mechanism. The minister showcased the development of the ministry's work in the digital transformation field, within the Egyptian state plan towards digital transformation and Egypt Vision 2030, especially the fourth axis which is the efficiency and transparency of the government institutions. She added that the ministry has put a comprehensive conception of the public services map in cooperation with other government authorities on top of them: Administrative Control Authority and National Council for Payments.

UAE Leads World in Mobile Penetration Rate

The United Arab Emirates leads the world in mobile penetration, according to a new report. Elsewhere in the Middle East, Oman is third. According to Hamburg-based research and information design firm Statista, the UAE has the highest mobile penetration rate in the world at 173 percent. In second place was Greece at 171 percent. Following Oman at third on the list are Portugal in fourth and Estonia in fifth place. With almost seven million (6.944 million) mobile subscribers at end of 2017 in Oman, the sultanate averaged about 1.5 mobile phones per person. The overall penetration rate was about 152.3 percent. Further, according to Oman's Telecom Regulatory Authority's (TRA) 2017 Annual Report, there were 78,000 more mobile subscriptions in Oman at the end of 2017 than the end of 2016. Prepaid mobile connections represent 90.63 percent of the total mobile subscriptions in the sultanate. Fixed telephone lines also are increasing in Oman, with growth of 21 percent in 2017 to 509,756 total lines – raising the penetration rate from 73 percent in 2016 to 87 percent in 2017. Unsurprisingly, the majority of growth in Oman's mobile and fixed line subscriptions was in the capital of Muscat – which was also, equally unsurprisingly, where the majority of fixed Internet connection, fixed broadband, and mobile broadband growth was. Omantel took up 42 percent of the overall market share. According to TRA, 70 percent of the sultantate's overall telecom revenue came from mobile services, 29 percent from fixed line services, and the remaining one percent from other telecom services. The average revenue per mobile subscription was RO7.2 in 2017, while it was RO27.1 for each fixed Internet subscription and RO4.1 per fixed telephone subscription.

e-commerce Registers Significant Growth in Pakistan

The e-commerce market in Pakistan has witnessed major development. The country has got the highest rates of mobile and internet penetration in South Asia, with forty million Internet subscribers. The count of the registered e-commerce merchants has seen more than 2.6 times increase in present times in mid of the 3G/4G services and the availability of the cheaper smartphones and internet packages. Pakistan has got one of the highest rates of mobile and internet usages in the South Asian region, with forty million Internet subscribers and twenty million Facebook users. This development in the sector has motivated many retailers to start and manage their own websites or use online marketplaces for selling their products. Still, there is still a lot of room for further growth and development. As per the statistics, more than USD54.47 billion sales was reported in the year 2017 just by Amazon in the United States, while Pakistan's e-commerce sales amounted for USD622 million in the year 2017 and is targeted to cross the USD1 billion mark by the year 2020. Other than technology, some of the factors that have worked as a catalyst for e-commerce growth includes the availability of cash at the time of delivery, ease of purchasing, customer reviews and feedback on social media platform and a variety of products to choose from. A senior official of the Corporate Innovation at Excellence Delivered (ExD)—one of the largest technology services firm in Pakistan said that although it is a fairly novel trend of business for Pakistan, the trend of online shopping is extending rapidly. The official explained the mechanics that operate behind e-commerce, highlighting the primary payment method presently being used is Cash on Demand (COD) where more than ninety per cent of online purchases are being done by COD at time of delivery to the customers. It is amazing to mention that nearly thirty-five per cent of the nation's monthly seventy thousand COD shipments are delivered outside Islamabad, Lahore and Karachi. It indicates that even the rural shoppers are also willing to go online for making purchases for the goods they cannot find in the local markets. The increasing growth in terms of sales and consumer preferences has also boosted the brands to reconsider their strategy regarding the conventional retail channels and to try alternate e-Commerce methodologies. The product quality is also an issue which should be taken care of by the online retailers for boosting the confidence of consumers.

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in **42** countries for **67** organisations

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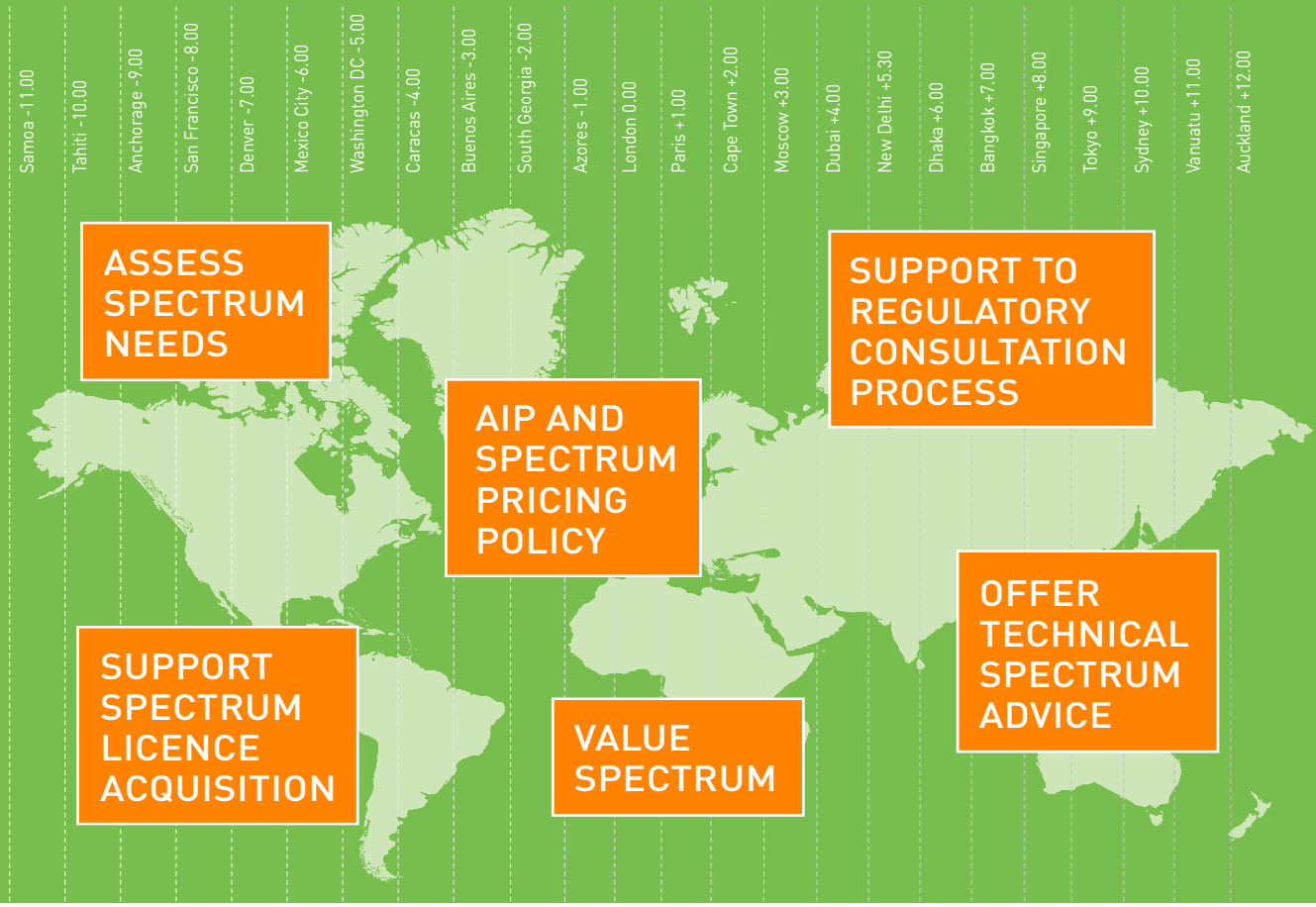

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ARTICLE

In-flight Connectivity Will be the Main Driver of Demand for High-data-rate Satellite Trunking by 2025

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analysys mason

Recent forecasts developed by Analysys Mason suggest that demand for Wi-Fi on board passenger aircraft will increase at a compound annual growth rate (CAGR) of 27% to 2025, becoming the main driver of demand for next-generation high-data-rate satellites.

We forecast that the global market for high-speed satellite trunking services will grow in value from EUR1.9 billion in 2017 to EUR4.7 billion in 2025. We believe that the fastest-growing segment will be in-flight connectivity for passenger aircraft, where wholesale revenues will grow from EUR278 million in 2017 to EUR1.9 billion in 2025.

This is one of the findings from a study that Analysys Mason is carrying out for the European Space Agency (funded by the ARTES Future Preparation programme). The study is exploring the requirements for next-generation high-data-rate satellite trunking systems, which we define as systems that deliver point-to-point connectivity with bandwidth of at least 10Mbps (uncontended) by 2025. We were asked to develop new regional market forecasts to 2025 for:

- *Service provider trunking:* traditional point-to-point connectivity for telecoms service providers and mobile backhaul
- *High-bandwidth enterprise services:* both land-based and offshore
- *Mobility platforms:* in-flight connectivity (IFC) for passenger aircraft; connectivity for cruise ships, ferries and other large vessels; passenger connectivity on railway trains.

We modelled each of these markets using a bottom-up approach which considered the number of end points for each of eight global regions which are likely to be served by satellite, the average bandwidth required per end point and the likely evolution of the wholesale price per Mbps (i.e. the price that a satellite operator can expect to receive).

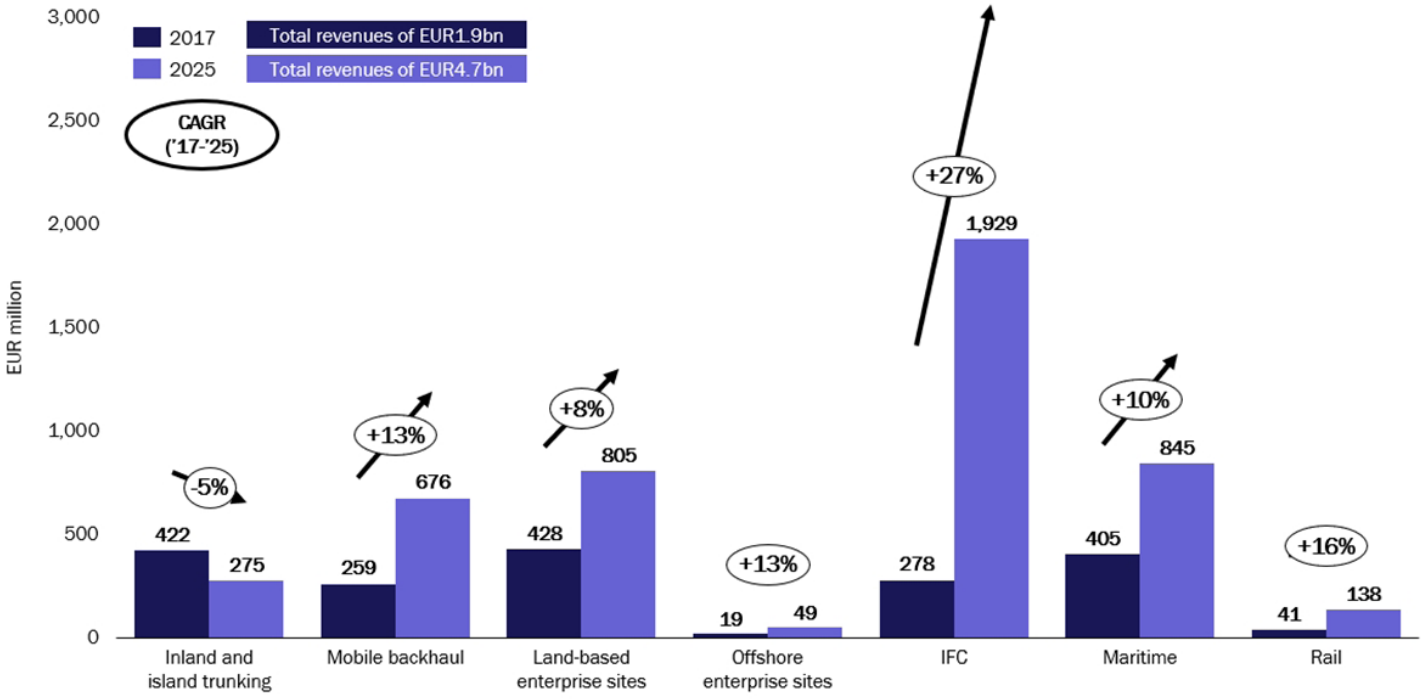

Figure 1: *Growth in high-speed satellite trunking revenues (EUR million), 2017–2025 [Source: Analysys Mason, 2018]*

Figure 1 summarises some of the key findings from the study.

We forecast that the global market for high-speed satellite trunking services will grow in value from EUR1.9 billion in 2017 to EUR4.7 billion in 2025. We believe that the fastest-growing segment will be in-flight connectivity for passenger aircraft, where wholesale revenues will grow from EUR278 million in 2017 to EUR1.9 billion in 2025. The dramatic rate of growth (27% CAGR) is due to a combination of: rapid increase in the number of aircraft equipped with satellite-based passenger connectivity (from around 3500 in 2017 to 18 000 in 2025), an increase in the bandwidth provided per connected passenger, and an increase in the proportion of passengers who use the service (arising from improvements in availability and performance). We also forecast that the demand for better connectivity on board cruise ships and ferries will result in a doubling of revenues in the maritime sector from EUR405 million in 2017 to EUR845 million in 2025, making this the second-largest segment after in-flight connectivity.

Land-based applications are more vulnerable to being replaced by terrestrial fixed networks (fibre or microwave). In recent years the satellite point-to-point connectivity market for telecoms service providers has declined considerably as submarine and terrestrial fibre networks have reached previously unconnected islands and inland areas. We expect this trend to continue and thus forecast that revenue from inland and island trunking will shrink from EUR422 million in 2017 to EUR275 million in 2025. However, we forecast modest growth in the number of mobile sites with satellite backhaul; and this, coupled with increased bandwidth per site as a higher proportion of satellite-connected sites support 3G and 4G networks, results in wholesale revenue increasing by almost 60% over the period. The number of land-based enterprise sites addressable by satellite falls over the forecast period, but we expect penetration of this shrinking target market to increase along with bandwidth per site, and thus wholesale revenues increase by almost 90% over the period.

We expect to see considerable variations in the bandwidth required per end point across the applications that we have considered. In our view cruise ships are likely to require the most bandwidth per endpoint, with the average requirement potentially exceeding 500Mbps by 2025 (there are expected to be almost 100 cruise ships with maximum passenger capacity in excess of 3000 by 2025). At the low end of the range, average bandwidth per end point for mobile backhaul and enterprise sites is expected to be just over 10Mbps in 2025 in some regions.

All of the forecasts are, of course, dependent on the price of satellite capacity. We have assumed that between 2017 and 2025 the effective price per Mbps will fall by more than 50% in all segments, with particularly steep declines in mobile backhaul and in-flight connectivity. We believe that mobile backhaul, inland and island service provider trunking and land-based enterprise are the most price-sensitive segments, while offshore sites and mobility platforms will sustain higher prices per Mbps. However, spectral efficiency is likely to be lower in mobility markets, and so the higher prices per Mbps will not necessarily translate into better profit margins for satellite operators that serve these segments.

Analysys Mason has considerable experience of forecasting demand and pricing for all types of satellite services as well as terrestrial services. For more information about our satellite consulting services, please contact Philip Bates.

SATELLITE NEWS

NSR Report: Non-GEO Satellites to Dominate Supply, Adding over 25 Tbps in Next Decade

NSR's Global Satellite Capacity Supply & Demand, 15th Edition report finds Non-GEO Satellite (NGSO) annual capacity revenues will skyrocket to USD4 billion by 2027. These networks offer a new set of attributes for customers such as low latency, full mesh connectivity, or high-bandwidth per terminal, and will be key to unlocking new greenfield markets. However, CAPEX exposure is massive, and

new revenue drivers might not be enough to pay back initial investments. Consequently, there is a risk of price disruption for the entire industry if these new players dump capacity to poach customers from legacy verticals. Constellations are approaching their moment of truth. "According to their schedule, LEOs need to start offering concrete examples of progress, but results are still mixed," notes Lluc Palerm, NSR Senior Analyst and report author. "Funding is still far from resolved and even the ones that have already attracted billions in investment still do not have a clear path to service. Delays and cost overruns plague many programs. Regulatory challenges are coming to light with first denials of access to key markets. Technology wise, there are still many questions to answer, beginning with user terminals. On the other side, progress continues in the form of testing satellites, new rounds of funding and establishment of baseband networks." Technology development has consumed most of the attention in the early stages of NGSO development. However, as we approach entrance into service, actors must shift their attention to commercialization. Constellations that can build a stronger position in key markets, both regionally and vertically speaking, will have higher chances of success. Partnerships between traditional GEO actors and new constellations are also proliferating. This creates a symbiotic relationship where GEOs can access new markets developed by NGSOs, while the new actors can leverage the long-standing customer heritage and sales channels of established operators.

PEMRA Auctions Licenses for 5 Satellite Television Channels

Pakistan Electronic Media Regulatory Authority (PEMRA) on Tuesday auctioned five licenses for satellite television channels. Galaxy Network was awarded the license of 'News' category channel, after offering a Rs 63.5 million bid for the same. Bol Enterprises was awarded the Entertainment category for Rs 48.5 million. Educational Channel license was awarded to M/s. Renaissance for Rs 10.5 million whereas the license for health channel went to Glam Network. Media Roots was awarded the license for agriculture television channel for Rs 10.5 million. The only bidder for Sports television channel, M-Record, failed to turn up so its auction was deferred. Earlier in his address, Chairman PEMRA Salim Baig said that the electronic media watchdog was holding auction of six satellite television channel licenses through open and transparent bidding. He expressed the hope that after arrival of these satellite channels, there would be an increase in healthy competition in the media industry. Director General Licensing Vakil Ahmed Khan said that the process of bidding TV channels had started in 2014 originally. However, due to stay orders from courts, the process was delayed.

Major Satellite Manufacturers Predict a Software-Defined Future

Executive leaders from the world's largest satellite manufacturing companies believe that software-defined satellites are the future of an industry that is seeing a majority of its customers transition away from GEO-focused business models. Speaking at a session titled 'Manufacturing: Shifting Towards A More Software-Defined World' at World Satellite Business Week (WSBW), senior executives from all the top satellite manufacturers tried to come to terms with new market dynamics. Jean-Loic Galle, President and CEO of Thales Alenia Space said, "Our customers are getting more demanding. There is more competition from terrestrial technologies. There is an uncertainty about the market. In terms of the market, software defined solutions are absolutely key. We are focusing around software technologies. We are working on the processors. We have developed some very powerful processors to drive antennas." When asked about future trends in the satellite manufacturing arena, Galle said he sees the main trend going towards mid-sized, totally flexible satellites. "There is uncertainty about the applications that the operators will use to drive this. Operators don't know what the most promising market will be in three-to-five years' time (for bandwidth). There will also be cases where customers want to target a specific market and confident that market will exist for a few years." Chris Johnson, President of Boeing Satellite Systems admitted that while it was important to make progress in terms of digital processors, innovation should be thought about in terms of how its drives cost-effectiveness. "We can add more flexibility within the spacecraft. The satellite that could go from band to band is the panacea," he said. "We need to get capability to market quicker. On standardization, there is a lot of work to do. We talk in numbers of satellites. While we are feeling some of those numbers in GEO will decline, we are taking steps to address those other aspects of the market. There will be less GEO satellites (going forward)." Nicholas Chamussy, EVP and Head of Space Systems for Airbus said that when it comes to innovation, the first thing his company is focusing on are software-defined satellites. He said Airbus has more than 15 satellites with software defined payloads either in orbit and getting ready to launch. In terms of electric propulsion, he said Airbus has 10 either flying or in development. Interestingly, Chamussy said it was not beyond the realms of possibility we could see 15-18 GEO satellites ordered in the future per year, which was definitely one of the most optimistic forecasts, especially as others like Gwynne Shotwell of SpaceX said they believe the market for GEO satellites could now be in a permanent decline. Lisa Callahan, VP & GM, Commercial Civil Space, Lockheed Martin Space Systems said even despite the tough market conditions, this is a really exciting time to be in space. "We need to define things with software. I think software defined satellites and ground systems are the future. That has been a big emphasis of ours. We are seeing a lower number of GEO satellites in the commercial world. This year, we have announced we are investing another USD100 million into our ventures business. So, USD200 million a year. We see partnerships as a key enabler. There are 975 new start-ups in the space industry. That investment in new technologies is key," she said. One of the strong performers in the manufacturing sector over the years has been Maxar's SSL satellite company. There is a strong possibility it could look to exit the GEO market at some stage, according to SSL President Dario Zamarian, who like others, admitted that the number of GEO communications satellite orders has dropped dramatically, with this year shaping up to be no better. Zamarian thinks that while there will be sufficient video business and a replacement market, it is not obvious that SSL's customers have found a magic formula for what happens next. Zamarian said SSL was thinking carefully on what it should do next in terms of GEO, and hinted at either a partnership or selling this part of the business. "The market is changing. We continue to pursue business. The market needs to be re-energized. Demand is there. We haven't found the right formula there," he said. On the technology side, Zamarian said manufacturers need to start thinking about optical payloads and about making satellites simpler to operate in space. "There are a number of technologies, including robotics that will be at the center of this revolution. We are working on standardization, because we believe a better supply chain helps. We are working on digital payloads," he said. "We are working on robotics. We want more homogeneous integration with 5G networks. Robotics and on-board servicing and on-board assembly will be a major way to do things quite differently going forward."

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WHOLESALE NEWS

EC Asks ACM to Justify VodafoneZiggo/KPN Wholesale Regulation Decision

The European Comm-ission (EC) has issued comments on Dutch regulator ACM's proposed wholesale broadband regulation of nationwide operators KPN and VodafoneZiggo, which were found by the watchdog's recent analysis to hold joint Significant Market Power (SMP) in a combined Wholesale Fixed Access market. ACM proposed that for the first time cableco VodafoneZiggo would be subject to similar wholesale network access obligations to those imposed on PSTN incumbent KPN in the interests of fair competition. The EC did not object to the definition of the relevant market and ACM's finding that both KPN and VodafoneZiggo are jointly dominant, but the Commission has asked the regulator to further substantiate its conclusion regarding the market definition, and to further justify 'the proportionality of extending the full set of remedies also to VodafoneZiggo, and to consider whether a more flexible price control remedy (economic reliability test rather than strict cost orientation) related to VULA [Virtual Unbundled Local Access] as well as all fiber and cable products could better address the identified retail market failures.' Additionally, the Commission pointed out that 'if the competitive landscape changes after the transposition of the [EU] Electronic Communications Code into national law, specifically if operators enter into cooperative arrangements or co-investment commitments, then the regulator should reassess the adequacy of the proposed regulation.' The EC's public release ended with: 'ACM will now have to take utmost account of the Commission's comments in the preparation of its final measures, to be published in the coming months.'

FNA Rules Out 5G National Roaming Obligation

Germany's Federal Network Agency (FNA, known locally as the Bundesnetzagentur or BNetzA) has said that mobile operators will not be required to allow national roaming when they roll out 5G networks, Reuters reports. The proposed terms for the 5G auction – planned to take place in early 2019 – do not include a binding commitment to allow national roaming, which would let a new entrant rent network access where it lacks coverage, making it easier for a new player to take on incumbent providers Telekom Deutschland, Vodafone and Telefonica Deutschland (O2). The proposed terms, which will be discussed by the FNA's advisory board on 24 September, also include an obligation that at least 98% of German households must be supplied with speeds of at least 100Mbps by the end of 2022, while at least 50Mbps must be available for busy regional and long-distance railroad traffic lines.

Italy Debating 30% MTR Cut

Italy's Communications Regulatory Authority (Autorita per le Garanzie nelle Comunicazioni, Agcom) is considering implementing a 30% cut to mobile termination rates (MTRs) in a move which has alarmed local cellcos. CorCom reports that the agency is debating a cut in the rate from the current level of EUR0.0098 (USD0.01149) to around EUR0.0065-EUR0.007. The recent entrance to the market of French-owned low-cost operator Iliad has led to a price war which is already impacting income for operators, while the ongoing 5G spectrum auction, which has so far attracted bids of more than EUR4.1 billion, is also putting financial pressure on cellcos.

German Regulator Says No To Mandatory Roaming in 5G Licenses

The German networks regulator has ruled out requiring domestic roaming under the new 5G licenses to support an eventual newcomer on the mobile market, Handelsblatt reports. According to the terms of the auction seen by the paper, the Bundesnetzagentur also decided not to make nationwide coverage mandatory with the new frequencies, as the bands are not suitable, it said.

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TECHNOLOGY NEWS

New WTA Report, "Factoring 5G into the Future," Assesses its Likely Impact on the Teleport and Satellite Business

The World Teleport Association (WTA) has released Factoring 5G into the Future, a new research report detailing the opportunities and challenges of the coming deployment of 5G mobile for teleport and satellite operators. The report explains the technology, the industry partnerships shaping the standards and the market-specific opportunities that deployment will bring, from expansion of IoT to communication with moving vehicles to the next step in video distribution. "A lot is being written about 5G," said executive director Robert Bell, "but not enough about what it specifically means for service providers in the satellite space. We interviewed executives from teleport operators, satellite operators, technology companies, mobile network operators, space agencies and industry associations to uncover the reality inside the 5G hype, as we know it today." The 5G standard will not be finalized until 2020 and there are no 5G mobile handsets available today. It is still vital, the report argues, for teleport and satellite operators to participate in its development, because 5G is more than a mobile standard. It is a new architecture, evolving from features already added to 4G, for how most of the world will communicate. A "satellite-friendly" 5G will only emerge if teleport and satellite operators educate themselves on its development and find ways to contribute. This report provides a starting point for executives who want to take action today to ensure their long-term success.

Voice Over 5G NR Infrastructure Market to be Worth USD13.6B by 2023: Report

The speed and capacity that 5G will deliver are often top of mind, but one thing that doesn't get talked about a lot is voice service. That's probably because 5G is going to be so much more than plain old voice. Yet voice will continue to be an essential component of virtually all solutions, which range from telepresence to telerobotics, according to a new report by Mind Commerce. Voice over 5G, or Vo5G for short, will take advantage of Voice over New Radio (VoNR), ultimately replacing Voice over LTE (VoLTE) as the prevalent technology for voice and leading to more displacement for 3G systems, according to the firm. VoNR infrastructure is expected to become a USD13.6 billion global market by 2023, growing at CAGR 65% from 2018 to 2023. The backbone IMS infrastructure will remain a key component for 5G, and IMS gear is expected to grow at a brisk pace, the research firm said. With 5G NR, there will be ultrahigh-definition voice and ultrahigh-definition video, which open a whole new range of options with things like telepresence, according to Gerry Christensen, founder and CEO of Mind Commerce. "I think it's not beyond the realm of possibility that we're going to start to see some really interesting things like telepresence using virtual reality, telepresence using holographic calling," he told FierceWirelessTech. Things of that nature will lead to much more immersive experiences. The good news for carriers is that they will have an even better defense against OTT competition with Vo5G than they currently have with VoLTE and RCS alone, according to Mind Commerce. That's because the analyst firm sees Vo5G as an essential element to virtually all next-generation apps and services going forward. North America will be the largest overall regional Vo5G market through 2023 at USD29.1 billion, growing at 70.8% CAGR. The Asia-Pacific and Europe regions will grow at 77.7% and 69.3% CAGR, respectively, through 2023, the firm predicts. In a white paper (PDF) published in July, Huawei noted that voice/video communications services were fully considered at the beginning of 5G standardization, and by June 2018 3GPP had completed the definition of basic Vo5G functions in Release 15. In the future, 3GPP will complete the standardization of Immersive Voice and Audio Services in Release 16.

Orange Poland Begins Outdoor 5G Trials, Expands FTTH Footprint

Polish fixed and mobile operator Orange Polska has begun outdoor trials of 5G equipment in conjunction with Huawei. The two firms say they achieved download rates of 1.8Gbps in a lab setting, while the first tests in an urban environment, at greater distances, resulted in speeds of 1.5Gbps, which Orange says is almost double what can be provided on its existing 4G LTE-A network. The outdoor trials are being conducted using a single transmitter in the city of Gliwice, using 100MHz of spectrum in the 3.5GHz band. Jean-Francois Fallacher, CEO of Orange Poland, commented: 'We're coming outside of the laboratory to check how the prepared solutions work "in battle". The tests carried out in Gliwice allow us to analyze how they function in real life urban conditions. The implementation of 5G will bring a qualitative change. It will not only benefit individual users, but also industry or, more broadly, the entire economy. In order to launch a new generation of mobile network efficiently and effectively, we need clear rules, arranging matters such as frequencies, electromagnetic standards, [and] the investment process. We are looking forward to discussions with the government and telecom authority regarding the regulation of these issues.' Separately, Orange has expanded its fiber-to-the-home (FTTH) coverage via a network leasing arrangement with smaller FTTH provider Nextera. The agreement will give Orange access to Nextera infrastructure passing some 450,000 homes by 2020, mainly in suburban and semi-rural areas. Orange hopes to cover five million premises with FTTH networks by 2020, both using its own infrastructure and via wholesale agreements such as the one with Nextera.

Swisscom Holds Switzerland's First End to End 5GNR Data Call

Swisscom has held Switzerland's first end-to-end 5G New Radio data call as part of its next generation network deployment in the city of Burgdorf. The operator used a 5G SIM card and a trial device built by Intel, as well as a 3GPP compliant 3.5GHz network using Ericsson's radio, baseband and transport solutions and the vendor's Cloud Packet Core on its NFVi solution.

Web browsing, voice and streaming were tested. It follows Vodafone and Huawei, which announced it had made the world's first 5G data call at Mobile World Congress this year. Swisscom is working with Ericsson on building Switzerland's first complete 5G network in Burgdorf for operation by the end of this year. The network will comprise 3GPP-compatible 5GNR core and transport networks, and antennas. The operator has received a test license for the Burgdorf trials and deployment. The trials will comprise speed, response times, beamforming, slicing and handover to LTE networks. One 5G antenna is already in operation in the city, with 10 more sites to follow in Burgdorf and the surrounding area in the coming months. Heinz Herren, outgoing CIO and CTO of Swisscom, said: "The experiences that Swisscom has gained with the 5G network in Burgdorf are very important for the launch of 5G." However, the operator reiterated concerns that the Swiss regulation model would make rolling out 5G more costly and also delay its nationwide deployment. An auction is set to take place early next year. Fredrik Jejdling, Head of Business Area Networks at Ericsson, added: "By achieving an end-to-end data call on the 3.5GHz band and kick-starting the 5G network rollout, we are helping Swisscom bring 5G services quicker to its customers. Access to new technologies will prepare industries for 5G use cases that will benefit the whole of Switzerland." In July, Swisscom carried out fixed-wireless access trials in the remote village of Guttanen and launched its 5G testing program last year.

San Marino to Become Europe's First 5G State

Telecom Italia (TIM) says its subsidiary in San Marino is set to turn the tiny country into the first state in Europe to boast full 5G coverage when it switches on its network later this year. TIM San Marino (TIM SM) and its parent company have been working with Nokia on the rollout of a 3GPP Release 15 site using Massive MIMO technology in the 3.5GHz band. TIM and Nokia say that by the end of this month they will also begin installing 26GHz equipment to turn San Marino into an outdoor test-bed for 5G services. The firms have not said when they expect 5G-capable end user devices to be made available on a commercial basis.

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REGULATORY NEWS

Universal Service Contribution Factor Surpasses 20% for the First Time, Highest Rate Ever

The proposed Universal Service contribution factor will exceed 20%. It will be 20.1% for the fourth quarter of 2018, according to a new FCC public notice. An FCC spokesperson confirmed that it is the highest ever. And it means that just over one-fifth of every dollar that users spend on interstate and international telecom services (essentially long-distance voice services) will go toward the Universal Service Fund (USF) program. The USF contribution factor has been creeping up for years. Back in 2012, we reported that the contribution factor had reached a then-whopping 17.4%. This situation has occurred, even though the FCC has essentially capped the budget for all four Universal Service Fund (USF) programs, because the revenues that carriers collect from voice services have been declining. At one time the USF was primarily a voice-focused program but as it has transitioned over the years to focus on broadband, the contribution base has not been adjusted accordingly. A logical question is why we are using voice revenues to pay for a program that is increasingly broadband-focused. Carrier groups – including competitive carrier association Comptel (now INCOMPAS), NTCA–The Rural Broadband Association and ITTA, which represents mid-size companies — suggested broadening the contribution base to include broadband service revenues several years ago, but the idea went nowhere. Politically, the suggestion that the pool of revenues against which the contribution factor is collected should be expanded to include broadband seems to be a non-starter, with parties as diverse as Republican FCC Commissioner Michael O'Rielly and consumer group The Free Press arguing against it. Opponents express concern that broadening the base would cause consumer bills to increase, even though the total amount of money collected should be the same, given a capped budget. Instead of voice consumers footing the entire bill, broadband customers would foot part of it, which seems only fair given that the money increasingly is going toward broadband networks and services. It's a frustrating topic, because when people only hear one side of the story, expanding the base sounds like a bad idea. In the meantime, don't be surprised if the Universal Service contribution factor continues to climb even higher. But keep in mind that the total amount of money being collected will change very little, if at all. And think about asking policymakers why the government continues to expect voice customers to foot the entire bill for broadband.

Vodafone and TPG to Merge in Australia

Vodafone Hutchison Australia (VHA) is to merge with local broadband provider TPG Telecom to create a fully converged telecoms company in Australia. The merger will bring together two of Australia's key players in the mobile and fixed line markets. "This transaction accelerates Vodafone's converged communications strategy in Australia and is consistent with our proactive approach to enhance the value of our portfolio of businesses. The combined listed company will be a more capable challenger to Telstra and Optus and will be much better placed to invest in next generation mobile and fixed line services to benefit Australian consumers and businesses," said Nick Read, CEO-designate of the newly formed entity. In addition to the merger, TPG and VHA have recently signed a joint venture agreement, with the intention of obtaining a quantity of 3.6GHz band, 5G mobile spectrum. The Australian government is set to auction off 125MHz of the spectrum in November 2018, and VHA and TPG's joint venture will take part in the auction process. VHA and TPG stated that the Joint Venture Agreement remains ongoing and will not terminate if the merger fails to proceed. Both companies anticipate that the merger will complete in 2019, subject to approval from TPG shareholders and regulatory authorities. In a statement released to the press, Vodafone and TPG said that if the merger does go through, the newly formed entity will be a "more powerful challenger to Telstra and Optus in Australia, with an integrated fixed and mobile offering. It will also be better able to invest in next generation mobile and fixed networks and drive innovation, service and product improvements to benefit Australian telecoms customers."

German Regulator Criticizes Nationwide 5G Call

Germany's telecoms regulator believes a call by politicians for operators to provide 5G coverage across the country is not feasible, as it published a draft for a 2019 5G license auction. A letter sent by members of the ruling Christian Democrats to Bundesnetzagentur, seen by Reuters, stated the draft did not form "a solid basis" for the 5G auction, and called for Deutsche Telekom, Vodafone Germany and Telefonica Deutschland to provide coverage along transport routes and in rural areas. Bundesnetzagentur president Jochen Homann stated "a nationwide buildout with 5G technology would be excessively costly," but said proposed auction terms did include a requirement for data speeds to be doubled. The regulator plans to auction 2GHz and 3.6GHz frequencies. Homann added longer-range frequencies, which would provide connectivity to users in remote areas, would be auctioned in coming years. The draft will be reviewed next week by a supervisory board which includes elected lawmakers, many of whom are being pressed by voters to improve connectivity in the country. A final decision is expected in November. Meanwhile there is also the question of whether a fourth player will enter the market. The letter said operators should provide access to competitors in areas where they themselves don't have coverage, with the agency acting as a referee if a dispute was to arise. If this condition is met, it could open the door for prospective new entrant United Internet. In an interview with press agency DPA, Vodafone Germany CEO Hannes Ametsreiter expressed concern that part of the spectrum was reserved for regional licenses, which he noted could serve as a "backdoor" for a fourth operator.

China Ready for Final Rollout of 5G Service

China is fully ready for the full rollout of fifth-generation (5G) telecommunications technology, and it's leading the world in the industry's development, experts said. However, they warned that the launch of 5G services may be hindered by shortcomings in domestic semiconductor manufacturing that can't be fixed quickly. Domestic cellphone chipmaker Spreadtrum Communications Inc has said it will launch commercial 5G chip production by 2019, the Xinhua News Agency reported on Sunday. Huawei Technologies will launch its first 5G-enabled phones as early as 2019, said Hu Houken, deputy chairman and rotating chairman of Huawei, at the 2018 Summer Davos Forum held in North China's Tianjin Municipality last week. "Our entire industry, from devices to infrastructure, is ready for the final rollout of 5G technology," Hu noted. However, Liu Kun, a Beijing-based semiconductor industry analyst, told the Global Times on Monday that China is still "strangled" by its Western partners in the chip manufacturing sector when it comes to developing 5G technology, as shown by the ZTE case. "Although chip companies in the Chinese mainland can do a good job in designing 5G chips, when it comes to manufacturing, which is a more complicated phase of the 5G chip production process, they have to rely on others," Liu said. Chinese chipmakers have achieved major breakthroughs, and they're now targeting the middle- and high-end markets in terms of mobile communication chip design with the advent of the 5G era, according to the Xinhua report, which cited Zhao Weiguo, chairman of Tsinghua Unigroup. "China can make its own 2G chips, but that's three generations ago, and the nation may not be able to catch up in the short run," Liu noted. Xiang Ligang, chief executive of telecom industry news site cctime.com, told the Global Times on Monday that despite disadvantages in the chip-manufacturing sector, China is leading the world in 5G development. It has a complete industry layout ranging from infrastructure to operators and application businesses, and no country can compare. China is forecast to be the world's largest 5G market by 2025, according to a report by GSMA Intelligence, a global mobile think tank, and the China Academy of Information and Communications Technology (CAICT). The CAICT has forecast that 5G will drive 6.3 trillion yuan (USD946.8 billion) worth of economic output in China by 2030. Xiang further pointed out that given growing trade protectionism in the global context, it's possible that some political factors might hinder the development of 5G technology in China, or even in the world. Despite this, it's not possible for another ZTE-like case to occur, since some US-based chip producers rely heavily on Chinese businesses, Liu said. Given China's strong phone production industry, orders from China might account for as much as 80 percent of their businesses, Liu estimated.

Content Leaders Call for Tougher EU Platform Stance

Executives from European online players including Spotify and Deezer called for the EU to toughen-up laws intended to address alleged unfair business practices of US giants such as Apple and Google, Financial Times (FT) reported. In a joint letter, the executives and representatives from the gaming and broadcast sectors, argued regulations drawn-up earlier this year do not go far enough in addressing "abuse of privilege" by the platform providers in their dealings with businesses. The letter brands the tech giants "gatekeepers to the digital economy", by using their dominant position to impose conditions to gain access to their channels. Apple, for example, tightly controls access to iOS devices, even specifying which payment methods can be used. FT said EU competition and business ministers will meet this week to discuss the draft legislation, which will then pass through the European Parliament and European Commission before it can come into force. While the guidelines will improve communication on how platform companies rank products and call for a formal complaints process, the executives wrote "transparency alone will not rebalance the relationship between platforms and the businesses that depend on them". The calls are, of course, not new, and Spotify and Deezer have been particularly vocal in their complaints. Google, Apple and Amazon all have their own music streaming services, but for them it forms part of a wider ecosystem around content and devices, whereas for Spotify and Deezer it is the be-all and end-all.

Orascom Gains Exemption from UN to Continue Operating North Korean JV

Egypt's Orascom Investment Holdings has announced via a statement to the Egyptian Exchange that it has been granted an exemption from the United Nations (UN) to operate in North Korea, Reuters reports. With the UN Security Council introducing measures to tighten sanctions on North Korea in 2017, in the process it made it illegal for companies to form commercial joint ventures (JVs) with their North Korean counterparts. As per a filing with the Egyptian bourse, Orascom confirmed that in the wake of that development it had moved to gain an official exemption that would allow it to continue to operate CHEO Technology (Koryolink), its JV mobile business with North Korea's Post and Telecommunication Company. Now, in a filing with the Egyptian Exchange, Orascom said it had received notice from the Egyptian embassy in New York last week that the exemption had been granted, though it stopped short of providing details.

UK Operators Press Politicians over Mobile Regulations

Operator-backed pressure group Mobile UK urged local and national governments to update planning regulations and ensure mobile connectivity is a prerequisite at the planning stage of urban and rural developments. At a parliamentary reception launching the Building Mobile Britain campaign, representatives from Mobile UK called on politicians to engage with operators and ensure access to land, the power grid and fibre in sites needed for mobile infrastructure. Echoing comments made by operators and regulator Ofcom at the Connected Britain event earlier this year, Mobile UK head of policy and communications Gareth Elliott also called on authorities to ensure mobile connectivity was central in designs for new developments including housing, industrial estates and roads. "Building networks that provide mobile connectivity is not the sole responsibility of mobile network operators," Elliott told the assembled politicians. "Yes, they build the physical network, but to do so requires a high level of partnership between many stakeholders." "This is all the more important at this time as coverage expectations increase in the hardest to reach areas and the next generation of mobile technology is going to be more and more complex and costly to install," he added. MP Stephen Hammond, who backs the campaign, described mobile as: "one of the most important parts of the [country's] infrastructure for the next 75 years," adding rule changes were needed to ensure the UK had "a digital economy that will be the best in the world." Mobile UK is backed by the country's four MNOs: Vodafone UK; BT-owned EE; Telefonica brand O2; and CK Hutchison's 3 UK. Its latest campaign is also supported by a number of local and national politicians.

FCC Faces Crucial Vote on 5G Infrastructure Policy

The U.S. Federal Communications Commission (FCC) is set to vote on a critical and contentious proposal this week that could prevent city governments from charging access fees for 5G infrastructure construction and installation, and force cities to approve or deny carrier applications within as little as 60 days or as many as 90 days. The vote, scheduled September 26, puts the agency at odds with city governments that have already partnered with carries to deploy 5G small cells and other infrastructure networks. The proposal's supporters, including the FCC's Republican majority, claim that the new rules would accelerate the pace of 5G rollout while saving carriers billions of dollars in fees and expenses. The savings, the agency said, could then be re-invested by carriers in connecting rural and underserved communities. Telecommunications companies in the United States are eager to invest in and deploy 5G infrastructure to stay ahead of nations like China, which have far fewer regulatory hurdles. FCC Chairman Ajit Pai admitted that striking a balance between leading the world in 5G innovation and adhering to free-market economics would be a major challenge for the U.S. He had stated publicly that the telecom industry is relying on his commission to speed up infrastructure rollout and 5G service deployment by cutting the red tape and eliminating regulatory hurdles. The FCC proposes that cities adhere to a 'reasonable' standardized application fee structure — a one-time USD100 fee to apply, and USD270 per year to maintain each small cell installation. This follows another order from March 2018, in which the FCC voted to exclude small cells from the same category of federal review procedures required for 200-foot cellphone towers — making small cell deployment much easier and faster for carriers. "Our action would eliminate around USD2 billion in unnecessary costs, which would stimulate around USD2.5 billion of additional buildouts," Pai and other Republican commissioners wrote in the proposal. "And that new service would be deployed where it is needed most — 97 percent of new deployments would be in rural and suburban communities that otherwise would be on the wrong side of the digital divide." Municipal governments argue that it is their right to charge fair market rate fees to carriers wanting to install small cells or other physical elements on public infrastructure. Some state governments also feel that the FCC proposal would steamroll legislation that some have already put into place to facilitate 5G small-cell deployment. The FCC acknowledged that many states (currently more than 20) and localities have "acted to update and modernize their approaches to small cell deployments. They are working to promote deployment and balance the needs of their communities. At the same time, the record shows that problems remain," The FCC's proposal also stated that "many state and local officials have urged the FCC to continue our efforts in this proceeding and adopt additional reforms. Indeed, we have heard from a number of local officials that the excessive fees or other costs associated with deploying small scale wireless infrastructure in large or otherwise 'must serve' cities are materially inhibiting the buildout of wireless services in their own communities." Despite the pitch to rural governments, not all of the beneficiaries here are on board with the FCC's plan. Last week, Paul Smith, Vice President of Governmental Affairs for the Rural County Representatives of California (RCRC), wrote a letter to the FCC expressing the organization's concerns with the language of the proposal. Smith wrote that while the RCRC supports policies that close the digital divide, the organization believes that "the proposed language set forth in the Order would actually incentivize increased deployment in already-served, historically high-cost markets." Smith pointed to certain elements of the proposal to support his claim. "The FCC's proposed new collocation 'shot clock' category is too extreme. The proposal designates any preexisting structure, regardless of its design or suitability for attaching wireless equipment, as eligible for this new expedited 60-day shot clock," he wrote. "The FCC's proposed recurring fee structure is an unreasonable overreach that will harm local policy innovation. We disagree with the FCC's interpretation of 'fair and reasonable compensation' as meaning approximately USD270 per small cell site … The FCC's decision to prohibit a municipalities' ability to require 'in-kind' conditions on installation agreements is in direct conflict with the FCC's stated intent of this Order and further constrains local governments in deploying wireless services to historically underserved areas." The FCC said it drafted the order based on feedback from multiple city and state governments, as well as carriers and investors. FCC Chairman Pai and his colleagues said that they are seeking a fair, yet realistic path to 5G rollout in the United States. "We have reached a balanced, commonsense approach, rather than adopting a one-size-fits-all regime. This ensures that state and local elected officials will continue to play a key role in reviewing and promoting the deployment of wireless infrastructure in their communities," the agency wrote in its proposal. For a better understanding of 5G infrastructure and deployment policy and how the FCC and other regulatory bodies impact rollout speeds, check out Via Satellite's free webinar, "What is 5G Exactly? What Everyone Needs to Know About Next Generation Wireless Networks" on Thursday, Sept. 27 at 11:00 a.m. with 5G Americas President Chris Pearson. The one-hour introductory webinar is a preview event for DC5G 2018 on Nov. 12 and 13 in Washington D.C. Please join us as we discuss this and other 5G developments for a variety of services and applications.

ITU Sees Mobile as Key to Boosting Broadband Access

The ITU tipped mobile broadband technologies including 4G and 5G to play a key role in connecting an estimated 50 per cent of the global population which today lack internet access. In a report by the Broadband Commission for Sustainable Development (established by the ITU and UNESCO in 2010 to boost broadband's place in international policy agendas), the UN agency noted wireless technologies will enable swift delivery of digital services covering agriculture, education, health, transportation, and disaster warnings and relief. Houlin Zhao, Secretary General of the ITU, said infrastructure, investment, innovation and inclusivity are "central to ITU's strategy to leverage the power of ICTs to expand access to broadband services and help accelerate the achievement of all UN Sustainable Development Goals." The Commission noted connecting those who today lack access to fixed or mobile internet is a major challenge: "The scale of infrastructure that must be built or upgraded to bridge the digital divide and deploy emerging technologies is considerable – last year, ITU estimated that connecting the next 1.5 billion people will cost USD450 billion," it stated in the report. It noted it had taken 25 years to deliver current levels of connectivity in easy-to-reach areas of developed countries; a fact it stated highlights the difficulty in bringing even another quarter of the world's population online in the next seven years, particularly in developing countries. However, progress is being made. The Commission's study noted a growing number of governments have established national broadband policies, with the number recently growing to 159 countries (roughly 81 per cent of countries in the world). At least 15 countries now also have strategies in place for promoting the safe use of artificial intelligence, added the Commission, highlighting the growing importance of smarter connectivity. The Commission's research drew on insights and contributions from operators, vendors, industry bodies and regulators. This showed a growing number of governments now benchmark the status of internet access in their national broadband plans, which the Commission said highlighted the "critical role" such connectivity plays for the world's population in terms of accessing digital services. Another key factor highlighted in the report was the target of making broadband affordable. The Commission noted 109 countries had achieved its targets on mobile broadband affordability, with 86 falling short. In fixed broadband, 73 countries had hit the goals compared with 122 which had not. Zhao said the analysis and policy recommendations contained in the report come at a crucial time in terms of the importance of internet access: "Broadband infrastructure is vital country infrastructure, as essential as water and electricity networks."

Court Gives DTAC Three Months to Migrate 850MHz Users

The Central Administrative Court in Thailand has given Total Access Communication (DTAC) three months to switch 850MHz users to a different spectrum band or operator, The Bangkok Times writes. The move comes just days after the National Broadcasting and Telecommunications Commission (NBTC) ruled against allowing DTAC an extension to its 850MHz concession, which expired on 15 September. As previously reported by TeleGeography's CommsUpdate, earlier this month DTAC filed a petition for an emergency injunction with the Central Administrative Court for a temporary protection order for its customers to continue using 850MHz mobile services after the expiry of its license. The third largest mobile operator by subscribers also filed charges against NBTC, calling for the court to withdraw the NBTC board's resolution made on 2 July, which rejected DTAC's request for a remedy period.

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

The Federal Communications Commission (FCC) has paused the informal 180-day transaction 'shot-clock' relating to its review of the proposed merger between T-Mobile US and Sprint. The watchdog notes that its decision has been informed by a series of newly submitted documents, including a 'substantially revised network engineering model' which 'appears to incorporate new logic, methodologies, facts, and assumptions'. As previously reported by TeleGeography's CommsUpdate, T-Mobile and Sprint entered into a definitive agreement to merge in an all-stock transaction in April 2018. They seek to create a company which will be 41.7% owned by T-Mobile's parent Deutsche Telekom (DT, which would have overall control) and 27.4% owned by Sprint parent SoftBank Group Corp, with the remaining 30.9% in free float.

More and More Governments Now Benchmark Broadband Status in Their National Plans, Says New Global Report

A new report issued by the Broadband Commission for Sustainable Development shows that a growing number of governments now benchmark the status of broadband in their national broadband plans. This year, the report shows for the first time that at least 15 countries now have strategies in place for promoting the safe use of Artificial Intelligence. The report, The State of Broadband: Broadband Catalyzing Sustainable Development, highlights the critical role that broadband connectivity plays for the world's people, from accessing online health services to receiving social security payments via mobile phones to receiving life-saving disaster warnings. "Broadband infrastructure is vital country infrastructure, as essential as water and electricity networks. The data analysis and policy recommendations contained in the 2018 State of the Broadband report come at a crucial time when Internet access is more important than ever before," said Mr. Houlin Zhao, Secretary-General of the International Telecommunication Union (ITU), who serves as co-Vice Chair of the Commission alongside UNESCO Director-General Audrey Azoulay. To boost broadband, the Broadband Commission recommends: building national leadership for broadband; promoting Internet training and stimulating consumer and business demand; monitoring ICT developments to inform policy; reviewing universal service measures; strengthening digital skills and literacy; supporting local eBusinesses and entrepreneurs; adapting legal frameworks; and reducing taxes and duties on telecom products and services. While the report demonstrates the value of Internet connectivity in today's increasingly digital world, it also raises concerns for the growing inequalities in access to broadband and how connectivity is used within and between countries, sexes and regions. Today, almost half of the world's people uses the Internet, mostly in urban and densely populated areas. The challenge of connecting people living in rural and remote areas to the Internet persists in many countries. The scale of the infrastructure that must be built or upgraded to bridge the digital divide and deploy emerging technologies is considerable – last year, ITU estimated that connecting the next 1.5 billion people will cost USD 450 billion. "4 I's – Infrastructure, Investment, Innovation and Inclusivity, are central to ITU's strategy to leverage the power of ICTs to expand access to broadband services and help accelerate the achievement of all United Nations Sustainable Development Goals," Mr. Zhao added. The report provides a global snapshot of broadband network access and affordability, with country-by-country data measuring broadband access against the Broadband Commission's seven advocacy targets. It also highlights the impact of rapidly evolving communication and information technologies (ICTs), including the implications of emerging trends like the Internet of Things, Big Data and Artificial Intelligence. Advances in mobile broadband (such as 4G and 5G) and next-generation satellite technologies will mean the delivery of digital services more quickly and reliably, with implications for the future of agriculture, climate, disaster relief, education, health and transportation. Key highlights of the report include updates on the Broadband Commission's advocacy targets:

Making broadband policy universal (Target 1)

Progress is being made in the establishment by countries of broadband policies, but only incrementally. The total number of countries with a National Broadband Plan (NBP) has seen a net increase of three, from 80% (156 countries) to 81% (159 countries). Also, a number of countries have approved their NBP (e.g. Bolivia, Democratic Republic of Congo, Maldives, Mali and Kuwait), while certain other countries' NBPs have lapsed.

Making broadband affordable (Target 2)

The Broadband Commission, in its new 2025 Targets, has reduced the broadband services affordability threshold target from less than 5% to less than 2% of monthly gross national income per capita. This new target will particularly assist lower income groups in developing and least developed countries to gain connectivity. The change in target, though, results in a lower number of countries meeting the affordability threshold. For fixed broadband affordability, 73 countries had achieved the new target, and 122 countries have yet to achieve it. For mobile broadband affordability, 109 countries had achieved this target, and 86 countries have yet to achieve it.

Getting people online (Target 3)

The report highlights the inherent challenges of bringing the "other half" of the world's population online, noting that it has taken more than 25 years to bring nearly half of the world online – mainly by connecting those in urban and easy-to-reach areas. It will be difficult to bring another quarter of the world's population online in the next seven years at current population growth rates of 5% per annum – especially in developing and least developed countries.

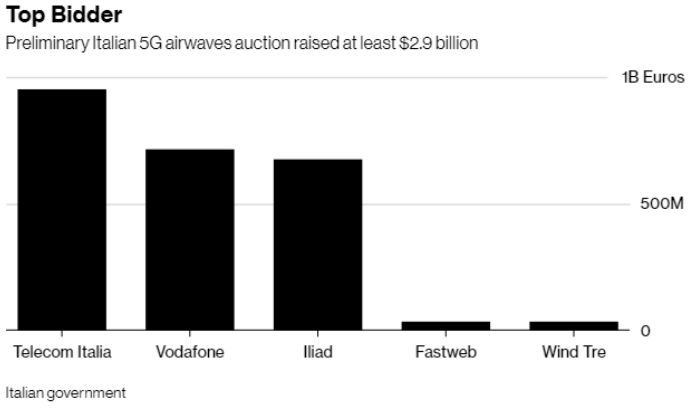
Acquiring minimum digital skills and literacy (Target 4)
The report cites low data availability related to digital skills, and shows how global averages for digital skills vary from 5.2% (using a programming language) to 43.7% (transferring files). As such, it identifies the need to define what can be considered a "minimum level of proficiency in digital skills", and to increase data collection in order to effectively measure advancements.

Using digital financial services (Target 5)
The report cites the rapidly expanding use of digital finance services – currently at 15.8% of the global population and 21.4% of the global adult population, and anticipated to increase to 40% of the global population by 2025.

Getting businesses online (Target 6)
The report identifies key enablers to bring more businesses and small- and medium-sized businesses online. This includes creating supportive legal and regulatory environments, increasing digital skills and literacy, and reducing costs such as import duties on Telecom/ICT equipment and services.

Achieving gender equality in access to broadband (Target 7)
The report highlights that, as per the most recent data available, the digital gender divide in fact grew from 11% in 2013 to 11.6% in 2016; and that women are, on average, 26% less likely to use mobile Internet than men. The report identifies increasing global efforts to address the digital divide, including the EQUALS Global Partnership (www.equals.org), and as such has an optimistic outlook for achieving gender equality in access to broadband by 2025.

TIM is Highest Bidder in 5G Sale



Telecom Italia, which operates under the TIM brand, has been named as the highest bidder in Italy's auction of 5G wireless spectrum. The Ministry of Economic Development (Ministero dello Svilluppo Economico, MiSE) has revealed that TIM made opening bids totaling EUR951 million (USD1.1 billion) for spectrum in the 700MHz, 3.6GHz and 26GHz bands. Meanwhile, Iliad, which launched mobile services in Italy in May, has so far offered EUR749 million for frequencies, including EUR676.5 million for a block of 700MHz band spectrum which has been reserved for a new market entrant. Wind Tre, Vodafone and Fastweb round out the bidders, with a total of EUR2.48 billion having been offered by the five participants. The competitive phase of the auction begins on September 13.

BSNL Allocated 4G Spectrum

State-owned BSNL, the fourth largest mobile operator in India, will receive 4G spectrum in the 2.1GHz band and plans to launch commercial service in March 2019, The Economic Times reported. The government approved BSNL's request for spectrum which it will receive by end-October, a Department of Telecommunications (DoT) representative said. The operator will install 50,000 additional towers in the next few months to take its total to 130,000, the newspaper reported. In February BSNL awarded Nokia a contract to deploy 4G and VoLTE services in ten regions in western and southern India with more than 38 million subscribers. Speaking in July 2017, BSNL chairman Anupam Shrivastava said he expected the government to approve its request for spectrum for the launch of 4G service. The operator, with nearly a 9 per cent market share, asked the DoT to allocate 5MHz of 700MHz spectrum in exchange for an equity infusion. Neither BSNL nor MTNL (also state run and the smallest player in India's crowded mobile market) participated in the country's 4G spectrum auction in October 2016. GSMA Intelligence data for Q2 2018 showed BSNL had about 113 million mobile connections, 82 per cent of which were 2G.

UK Announces £50m Multi-City 5G Testbed

The West Midlands is set to become a key technology hub for the UK, as the government announces the launch of a new 5G test bed facility in the area. The UK's first multi-city test bed will be based in Birmingham, Coventry and Wolverhampton and will pave the way for nationwide rollout of next generation mobile networks. "5G has the potential to dramatically transform the way we go about our daily lives, and we want the citizens of the UK to be amongst the first to experience all the opportunities and benefits this new technology will bring. The West Midlands Testbed, which is the first of its kind anywhere in the world, will be instrumental in helping us realize this ambition," said the UK's Minister for Digital, Margot James. The project is set to receive an initial £50m of funding – with £25 million being provided by the Department of Culture, Media and Sport, and £25m coming from private investment. The project may also receive an additional £25m of funding from the government at a later stage. The testbed will focus on connected healthcare and connected transport initiatives, including a connected ambulance project that would look into providing remote medical support to paramedics on the ground, allowing lifesaving procedures to be carried out on site. The Mayor of the West Midlands, Andy Street, said that the launch of the testbed would be hugely transformative for the region, creating a host of jobs and financial initiatives in the area. "This announcement is game-changing for the West Midlands economy. This will be the backbone of our future economy and society. We have been working to put the foundations in place to grow the industries which will create the jobs of the future, particularly around driverless vehicles and life sciences where we have a genuine advantage. To deliver the future of these industries we need the power of 5G," he said.

Duterte Government Publishes Final Rules for Third Telco

The government of the Philippines published its final terms of reference (TOR) for the selection of the country's New Major Player (NMP) – a.k.a. the so-called 'third telco' – paving the way for the bid process which could finally begin in November 2018. With President Duterte determined to announce the name of the NMP before the end of this year, the Department of Information and Communications Technology (DICT), working with the National Telecommunications Commission (NTC), issued the final TOR which includes a number of key amendments – such as an increased emphasis on how higher internet speeds can be achieved. In addition, the final version of the rules are thought to include more flexible arrangements vis-a-vis the winning bidder's performance security: the rules allow the NMP to lodge a 10% security of around PHP700 million (USD12.95 million) (payable either through cheque, bank draft or confirmed letter of credit), whereas previously it was thought DICT would seek a 10% cash bond or 30% surety bond. The final TOR also confirms that the performance security would also be fixed at 10% of the remaining capital and operational expenditures through the commitment period. Going forward, NTC Commissioner Gamaliel Cordoba told journalists that with the publication of the final TOR, the rules would become effective 6 October 2018, at which date bid documents can also be purchased for PHP1 million. The bid deadline for submissions is set at 5 November 2018. Among the key revisions to getting agreement for the final TOR, the government amended the weighting for minimum average broadband speed, which was increased to 25% from 20% in the latest draft. The weight for national population coverage was maintained at 40% while capital and operational expenditures, previously at 40%, have been trimmed to 35%. Bids will be assessed with a maximum of 500 points awarded on these criteria over a five-year period, while for national population coverage, the minimum requirement for the first year is 10% while the maximum is at 50%. The minimum average broadband speed for both fixed and mobile broadband services, has been set at 5Mbps – although bidders receive extra points for every 2Mbps increase they promise above the minimum. Bids below 5Mbps will not be considered. In terms of CAPEX, the minimum in the first year is set at PHP40 billion while the maximum is PHP140 billion, and additional points can be earned for every PHP10 billion allocated above the base line. Based on the final TOR, radio frequencies in the 700MHz, 2100MHz, 2000MHz, 2.5GHz, 3.3GHz and 3.5GHz bands will be awarded. Companies wishing to participate in the process must: hold a valid Congressional franchise; not be a subsidiary, affiliate, or have any corporate or financial interest with incumbent mobile operators PLDT Inc. and Globe Telecom as of 31 December 2017; and must have a written and binding commitment from a foreign venture company. DICT Memorandum Order No. 1 (issued 8 January 2018) confirmed that, 'the applicant with the highest committed investment for the first five years shall be selected'.

DT Wants Door Closed on Fourth Operator Ahead of German Spectrum Auction

Deutsche Telekom has demanded a fair deal for operators ahead of Germany's forthcoming spectrum auction, amid suggestions the country could be opened to a fourth operator. Dirk Wössner, the executive in charge of its German business, said the mobile industry needs help if it is to stay "at the forefront of technological progress" as a "major league player". Speaking at the IFA trade fair in Berlin, which ends on Wednesday, Wössner laid out a series of demands he saw as critical for the health of the German telecoms market. The auction is due to take place in spring 2019. He said there should be no obligation to hand over every new product and technology to third parties, which he claimed would stifle the development new solutions and hit investment in rolling out networks. He also called for no reservation of regional spectrum or mandatory national roaming. The latter is particularly vexing operators amid calls in Germany for the market to be opened up. Earlier this month, the country's antitrust regulator said a fourth player should be allowed to enter the market. However, reports suggest the telecoms industry regulator BNetzA will allow national roaming in the event of an operator having a dominant market position. Wössner said the market was a strong enough competitive arena, with three major operators and 40 discount players. He said: "We anticipate that the volume of investment for the sector will be considerable. "Figures of this magnitude are not to be taken lightly – nobody is going to be paying for it out of their petty cash. "One thing should be clear – we can't have a situation where only some are investing and bearing the risks while others only reap the rewards. Finally, Wössner said the regulator needed to be realistic about 5G expansion, arguing the technology will be deployed where technically feasible. Comprehensive coverage would be fulfilled through a mixture of broadband and LTE. He added: "In order to continue this success story, dependable and fair framework conditions need to be in place for spectrum auctions. Companies purchasing frequencies, thereby investing large sums in the networks and taking on considerable risks, do not wish to be subject to regulatory experiments." Meanwhile, Deutsche Telekom unveiled its smart speaker at the event, with 1,000 of its customers to "train" the device. Consumers can sign up to receive the device free of charge. The speaker can operate devices and use services through the "Hello Magenta" voice command. It is built using software it developed with Orange, whose smart speaker goes on sale later this year. Other products Deutsche Telekom launched included a new mesh Wi-Fi solution connecting up to five other devices.

Vodafone and Idea Cellular Merge to Create India's Biggest Telco

The long awaited merger between Vodafone India and Idea Cellular has finally been completed, following the issuance of regulatory approval from India's governing bodies. The newly formed entity will be named Vodafone Idea and will boast 408 million subscribers across the sub-continent. Last year the companies posted combined revenues of around €7.1bn. Balesh Sharma will become chief executive officer of Vodafone Idea, stepping up from his previous role as chief operation officer at Vodafone India. The merger comes in the nick of time for both companies, as India's savage market conditions continue to take their toll on Indian telcos. Vodafone Idea expects that the merger will deliver €1.7bn of cost saving synergies and reductions in capex in the first year alone. In addition to the completion of the merger, Aditya Birla Group is separately completing the purchase of an additional 4.8 per cent stake in the newly formed Vodafone Idea, in a deal reportedly worth over €300 million. Vodafone Group will own 45.2 per cent of the newly formed company, with Aditya Birla Group's holding rising to 26 per cent.

IDC Forecasts Telecom Infrastructure Market to Reach USD16.35B in 2022

The shift to software-defined infrastructure – wherein workloads run virtualized (or containerized) on industry-standard hardware platforms – is happening at an unprecedented pace. Nowhere is this shift more visible than in the Telecommunications industry where entire datacenters are being converted from vertically integrated stacks to software-defined infrastructure. IDC expects this trend to continue unabated as Telecoms (also known as telecommunications providers, communications service providers, carriers, or telcos) seek to expand their sphere of influence on initiatives such as mobile media delivery, edge computing and the Internet of Things, and connected devices, to name a few. In an industry where legacy business models and regulations can no longer guarantee revenue growth, telecoms must stay ahead of the competition by upping their ante on innovation and, like most enterprises, driving costs down. Initiatives such as 5G or rich media delivery via mobile platforms cannot be delivered via legacy platforms that are rigid, have scaling challenges, and require months of planning to scale efficiently. A new forecast from International Data Corporation (IDC) sizes the market for compute and storage infrastructure for Telecoms at nearly USD10.81 billion in 2017. However, as Telecoms aggressively build out their infrastructure, IDC projects this market to see a healthy five-year compound annual growth rate (CAGR) of 6.2% with purchases totaling USD16.35 billion in 2022. Communications service providers worldwide have borrowed a page out of the public cloud services provider/ hyperscaler operations model. They have focused maniacally on bolstering their in-house software development efforts using open source stacks, partnering with integrators to convert their datacenters to be software defined, sponsoring and participating in industrywide infrastructure consortiums, and making a concerted effort to move not just applications, but also network function workloads onto a virtualized (containerized) infrastructure. They are shifting to a single infrastructure platform that supports current and new generation telecom-specific as well as business applications that can run interchangeably in virtual machines, containers, and bare metal. Telecoms have ushered in a model for flexible and scalable consumption of compute, storage, and networking resources. "Telecoms are the forefront of the innovation curve," said Ashish Nadkarni, group vice president for Infrastructure Systems, Platforms and Technology at IDC, which covers compute and storage infrastructure. "The shift to a software-defined infrastructure enables them to focus on innovation, drive operations costs down, and continue to differentiate based on the uniqueness of their products and services." The report, Worldwide Telecom Infrastructure Forecast, 2018-2023 (IDC #US44224418), presents IDC's inaugural forecast for a significant portion of infrastructure market for Telecoms. Revenue is presented for the overall market and each of the two market segments (infrastructure hardware, which consists of storage and servers, and infrastructure software). The report also provides a market overview, including drivers and challenges for communications service providers and advice for technology suppliers.

Chinese 5G Mega-Merger Could Create World's 2nd Biggest Telco

China could potentially merge two of its three biggest telcos, in an attempt to help it regain the initiative in its 5G arms race with the US. The Chinese government is looking at plans to merge China Telecom and China Unicom, sources told the Bloomberg news agency. Should the merger go ahead, the newly formed entity would boast 584 million subscribers, enabling it to leverage enormous economies of scale, the likes of which US operators could only dream of. As China-US relations continue to deteriorate in the face of escalating trade tensions, China is placing renewed importance on its desire to be "first for 5G". "5G success is one of the most important goals to China and the merger is the perfect solution to what China wants to achieve," Edison Lee, an analyst at Jefferies Hong Kong Ltd., told Bloomberg. "As we head into another step up in the U.S.-China trade war, we believe the State Council would be more eager to think fresh and more radically about how to accelerate 5G rollout."

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