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SAMENA TRENDS

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BUILDING DIGITAL ECONOMIES

THIS MONTH

PROMOTING 5G INVESTMENT AND BUSINESS MODELS

SAMENA TRENDS

Editor-in-Chief
Bocar A. BA

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Promoting 5G Investment and Business Models

We do know, as a matter of fact, that 5G will transform our industry (as well as adjacent industries), our business models, regulatory approaches, and how the end-user will interact with the network – which too will be a lot busier and more connected than any of our previous generation networks. Another thing we do know is that the 5G ecosystem will require creativity and collaboration among industry stakeholders, including regulators, network operators, technology and solution providers, and, most importantly, the end-users.

What we don't know still is how this transformation will actually feel like and affect so many things in so many ways. But we can imagine: For average consumers, 5G technologies and services could speed up connections, allowing implementation and easier use of VR and AR technologies. For professionals, improved connectivity and low-latency based communication would open new doors for new career opportunities. For businesses, 5G could help accelerate deployment of enterprise-centric technologies, including of IoT products.

Low latency offered by 5G - rather than just faster speeds - will be a great game-changer; something that will enable the creation of new business models and innovation in billing, for example. By the end of the current year, we will witness some of the spectacle of 5G's promise, for full-scale 5G trials are already underway as we speak, with commercial deployment in site by next year.

On many accounts, however, there is a need for preparing for investment into 5G, which has the potential to help us all create a sustainable digital society; a collective goal for the public and private-sector stakeholders. Therefore, it is important that all regulatory frameworks, including those guaranteeing fair availability of spectrum resources and ensuring predictability for infrastructure investment are put in place.

Already operators, aspiring to become the first adopters of 5G are putting in place different business models: Some are preparing to follow an "infrastructure-based" business model to become all-IP service providers, which will requiring unifying the infrastructure via the cloud for customers' connectivity and data needs, and could help drastically reduce cost of service delivery and expedite introduction of new services to the market. Other could follow a "content-based" business model to offer high-resolution 8K live content streaming by analyzing market trends and eye-ball preferences in the market. This would require dedicated bandwidth and could be billed on a duration basis. QoS issues will be managed through advanced BSS processes and the end-user would automatically receive discounts in the case QoS issues appear. Still others may even consider implementing an "IoT-based" business model for ensuring water supply to needed areas. This would require sensors and water delivery infrastructure (through potential collaboration between a telecom operator and municipal water supplier). The sensors would help ensure water supply and monitor water consumption, thereby making water consumption a billable service for the operator. Investments in this case would be needed to ensure that sensors are reliable, remain always connected to the network, and that the network has sufficient capacity to handle large piles of data generated by the sensors.

In any given practical and implementable scenario, new business model development in the 5G world will be centered on end-users (which includes not just humans but also machines that consume and generate data) and their need to access Internet media, digital streaming video content, and heaps of other diversified data. While there is no guarantee, in any case, that ARPU would increase with 5G offerings, a constant focus on meeting users' data needs certainly could bring users closer to their service providers. And, as we know, telecom operators should no longer feel satisfied by being just the access

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Chief Executive Officer
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providers. Speed and access are no longer the biggest drivers of success with customers.

Building viable 5G business cases will require much more than just speed. It will require creativity in building a new ecosystem that brings a wider array of digital services to their intended consumers. This, in turn, will require parallel investments into both telecom network infrastructure as well as supportive IT systems, service management platforms, and processes.

5G may best be thought of as a new generation of service roll-outs across sectors, and thus can only be made possible through new modes of partnership, collaboration, policies, stakeholder communication, and a collective aim to build a self-sustaining digital ecosystem where harmony prevails.

Warm wishes to all of you for a great 2018!

2017 REGULATORY ACHIEVEMENTS AND HIGHLIGHTS

Communications and Information Technology Commission - Saudi Arabia (CITC)

H.E. Dr. Abdulaziz Salem Alruwais
Governor
CITC - KSA

هيئة الاتصالات وتقنية المعلومات
Communications and Information Technology Commission

Regulatory Achievements and Highlights during 2017

- CITC and Zain KSA signed an agreement to implement three high-speed wireless broadband projects for remote areas of the Kingdom as part of the Universal Service Fund. The three projects are expected to provide service to more than 800,000 beneficiaries in 3,900 villages across 28 districts of Riyadh, Eastern Province, Asir Region and Makkah.

- CITC announced that video and audio features of OTT Apps are available in the Kingdom of Saudi Arabia, to enable customers, citizens and residents, to benefit from Apps that provide voice and video communications over the Internet.

- The Ministry of Communications and Information Technology (MCIT) and Saudi Telecom Company (STC) have inked an Implementation Agreement for the deployment of fiber-optic services in urban areas, effective August 1, 2017. In May 2017, STC signed an agreement with the MCIT and CITC for the deployment of fiber-optics in the Kingdom of Saudi Arabia. The government-led project is aiming to link 1.3 million households with high speed services by 2020.

- A broadband project aiming to provide high-speed internet access to households in sparsely-populated areas across the Saudi Kingdom is 50% complete ahead of schedule. A total of 70,000 people across 13 governorates in Riyadh, the eastern region, Al-Jouf and the Northern borders region have benefited from the improved connections, following the broadband rollouts. In March 2017 the CITC awarded Phase I of the broadband coverage expansion project to Zain Saudi Arabia. Under the contract, the operator is set to increase high-speed broadband coverage in the Kingdom's underserved areas to 70% by 2020.

- CITC awarded additional spectrum in the 700MHz and 1800MHz bands to mobile operators Saudi Telecom Company (STC), Zain Saudi Arabia and Etihad Etisalat (Mobily), following an auction which held on May 23, 2017.

- CITC represented by the Saudi Network Information Center (SaudiNIC), hosted a workshop on the Domain Name System Security Extension (DNSSEC). It was held in coordination with the Middle East Network Operators

Group (MENOG) to promote adoption of DNSSEC within national networks in Saudi Arabia. This complements efforts to develop the Saudi Internet Domain Name System (.sa), using DNSSEC technology. The meeting highlighted DNSSEC's role as a complete set of technical specifications, designed to protect information provided by the Domain Name System (DNS), which uses the Internet Protocol (IP) system.

- In order to provide a developed ICT services with high quality, to improve the experience of ICT users in line with the latest developments in this vital sector, and to promote fair competition and to protect the public interest and the interests of users and investors, CITC published a Public Consultation document on the updated Quality of Service Framework and invites all members of the public, including individuals, public organizations and commercial entities (together, the "Participants") to participate in this process.

- CITC awarded unified telecoms concession to mobile operator Etihad Etisalat (Mobily). The authorization will allow Mobily to provide fixed telephony and broadband services in the kingdom. Earlier, Zain was also awarded its respective unified concession.

- CITC collaborated with SAMENA Telecommunications Council to prioritize digital transformation and emerging issues and challenges in digital development, to support the national ICT vision. CITC was the Patron for SAMENA Telecommunications Council's Regional Regulatory Summit in Riyad.

- The volume of the telecom sector in the Kingdom is estimated at SR180 billion while capital investment is more than SR50 billion, said Dr. Abdulaziz Bin Salem Al Ruwais, Governor of the Communications and Information Technology Commission (CITC). Addressing a forum on the sector in Riyadh, Al-Ruwais said spending on telecom and IT reached more than SR130 billion in 2016.

Telecommunications Regulatory Authority - UAE

H.E. Hamad Obaid Al Mansoori
Director General
TRA - UAE

Regulatory Achievements and Highlights during 2017

- TRA achieved three certificates from the International Standardization Organization (ISO) in the areas of business continuity, quality management system and environmental management system. Hamad Obaid Al Mansoori, TRA Director General, received the certificates during a special meeting with Ahmad AlKhatib, Director General of the British Standards Institute in the Middle East.

- The Telecommunications Regulatory Authority (TRA) participated in the 21st session of the Council of Arab Ministers of Communication and Information Technology in Cairo, headed by Egypt. Hamad Obaid Al Mansoori, TRA said that a proposal will be prepared for the establishment of an Arab telecommunications union amidst the technological boom being witnessed in the region.

- TRA hosted "RIPE 75" meeting on October 22-26, in Dubai. RIPE 75 is the first international meeting to be held in the Middle East, discussing Internet protocols, information systems and network operation. RIPE 75 featured RIPE Working Group Sessions that focus on discussing technical and regulatory challenges that hinder the Internet industry, information systems and network operation. The Meeting was attended by representatives of key government agencies, regional and international companies and entities.

- TRA held a workshop for mobile phone operators to highlight the methodologies that TRA undertake in their upcoming mobile network audit, the results of which will be included in the TRA's annual mobile quality of service report which is expected to be published before the end of the year. Among the aspects that the audit will cover, include measurements of mobile operators' compliance with the coverage terms set out in their licenses.

- TRA signed a memorandum of understanding (MoU) with 'Creative 971' to support e-Commerce with a focus on small and medium businesses wishing to operate in the country. The issues covered in this MoU include mainly the exchange of consultations and experiences through participation in joint meetings and workshops, sharing information and data, and coordination on the results and the ways to use them. According to the agreement, 'Creative 971' will enhance and develop the e-Commerce Sector in the UAE through awareness program for start-ups, small and medium businesses.

- TRA in cooperation with the Prime Minister's Office hosted the first meeting of the Executive Team of Smart Government Services, which emerged from the annual meetings of the UAE Government, launched by Vice President, Prime Minister and Ruler of Dubai, His Highness Sheikh Mohammed bin Rashid Al Maktoum. The team is responsible for assessing the smart services situation in the country, their mechanisms, provision channels, and ways to upgrade them with the aim of developing smart government services and enhancing the competitiveness position of the UAE on global level, to reach the desired goal of making the best of these services in order to achieve customers' happiness.

- The TRA said that mobile phone usage in the Gulf Arab state increased to 228.3 devices per 100 people as of March 2016. The TRA in Abu Dhabi did not release comparative figures from previous years. However, it was revealed that there was an increase in the number of telecom subscribers in March 2017, by more than 132,000 new subscriptions compared to February. "This led to a jump in the total number of cumulative subscriptions to 19.835 million," said the report.

- The TRA signed new strategic partnerships with Etisalat and du telecommunications. The memoranda are part of the TRA's plan of action aimed at achieving the objectives of the UAE National Vision 2021 to raise the country's ranking among the top 10 countries in the National Readiness Index, NRI, in the World Information Technology Report. Hamad Obaid Al Mansouri, TRA Director General, signed the first MoU with Saleh Al Abdooli, Chief Executive Officer of the Etisalat Group and the second with Osman Sultan, CEO of du.

- TRA UAE collaborated with SAMENA Telecommunications Council to prioritize digital transformation and emerging issues and challenges in digital development, to support the national ICT vision. TRA UAE was the Chief Patron for SAMENA Telecommunications Council's Leaders' Summit Conference in Dubai.

- TRA signed an agreement with the Department of Economic Development of Dubai (DED) to enhance cooperation and coordination efforts for joint national indicators of the Network Readiness Index (NRI). The cooperation aims at implementing national agenda objectives to achieve a sustainable environment and integrated infrastructure.

- The TRA evaluated the customer service centers of Etisalat and du and grading them in a bid to provide better services to customers. The 'Erteqa' initiative was launched last year, but TRA had completed the pilot evaluation process and implemented it, which includes a range of efforts and initiatives that focuses on customer's happiness. The 'Erteqa' initiative falls under the umbrella of 'Esaad' initiative which includes network centers, ICT rating and coverage. Hamad Obaid Al Mansouri, Director General of TRA, said that the evaluation is based on seven stars criteria, and plates bearing the number of stars as a certificate of quality of excellence for the center's efforts in serving the customers and achieving their happiness.

- The TRA is maintaining the royalty rate payable by local telcos Etisalat and Du at the same level as in 2016, with the extension to run for five years to the end of 2021. The operators pay 15% of their revenues and 30% of net income to the government each year. Etisalat, which also has operations in 17 countries outside the UAE, will only pay royalties based on its domestic income. Prior to 2016 newer entrant Du paid a lower fee than its rival, but their rates were synchronized last year. Etisalat and Du compete head-to-head across the entire UAE fixed and mobile sectors.

- The TRA Computer Emergency Response Team (aeCERT) and the Spectrum Management Affairs Department, participated at the International Defense Exhibition and Conference (IDEX 2017), launched in Abu Dhabi National Exhibition Center (ADNEC). TRA, represented by the aeCERT, won membership in the general assembly board for computer emergency response teams (CERTs) in the Organization of Islamic Cooperation (OIC). The announcement came during the TRA's participation in the agenda of the annual conference and meeting of the general assembly of CERTs in the OIC, entitled "Toward a responsive nation to the variables of cyberspace" held during the period 11-14 December 2016 in the KSA.
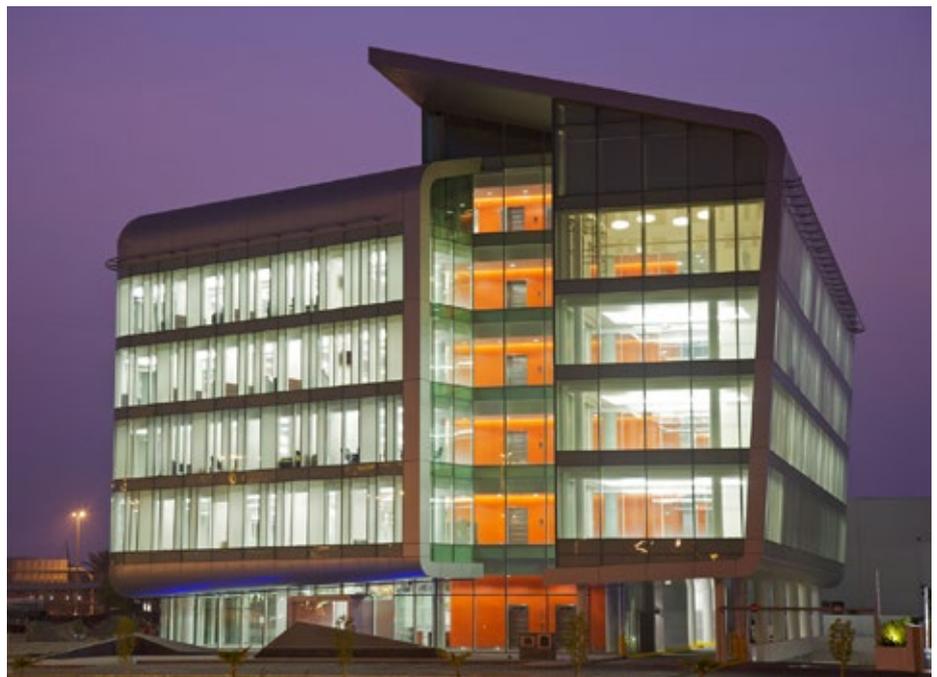
Communication and Information Technology Regulatory Authority - Kuwait

H.E. Salim M Al Ozainah
Chairman & CEO
CITRA - Kuwait

Regulatory Achievements and Highlights during 2017

- The Chairman of the Communication and Information Technology Regulatory Authority (CITRA) of Kuwait Eng. Salim Al-Ozainah seeks "to boost the contribution of the communications sector in the country's GDP from 2.3% to 3.5%," hoping to raise it even further. A memorandum of understanding between Huawei and CITRA, which includes providing the necessary consultations to reach a "Smart Kuwait" in line with vision of Kuwait 2035, is expected to contribute to this effect.

- CITRA's Chairman of the Board of Directors has stressed the importance of call centers, keeping abreast with the great progress achieved in order to provide and improve services in Kuwait. Kuwait is keen to keep up with the major developments in call centers by reviewing the most important developments and discussing ways to improve performance, and to advance the quality of services provided by the centers in both the public and private sectors.

- The Chairman of the Communication & Information Technology Regulatory Authority (CITRA), Eng. Salim Al-Ozainah, based on National Cyber Security Strategy called on all government agencies, companies, institutions and individuals to act quickly to protect their systems against potential cyber threats. CITRA sent a copy to all government agencies outlining recommended steps and precautionary measures to avert any cyber-attacks.

- CITRA is endeavoring to follow suit in what the most advanced countries have achieved through ICTs, and to continuously stay up to date with the latest global developments. Kuwait will benefit from the knowledge transfer, experience and expertise of US companies in Kuwait.

- CITRA collaborated with SAMENA Telecommunications Council to prioritize digital transformation and emerging issues and challenges in digital development, to support the national ICT vision. CITRA was the Chief Patron for SAMENA Telecommunications Council's Convergence to Kuwait Conference in Kuwait.

Telecommunications Regulatory Authority - Oman

H.E. Dr. Hamed Salim Al Rawahi
Executive President
TRA - Oman

Regulatory Achievements and Highlights during 2017

- The TRA has recently cooperated with the Ministry of Environment and Climate Affairs and contracted with a global company specializing in measuring emissions of electromagnetic radiation from telecommunication stations. The project aims to determine the extent of the licensee's compliance with the standards approved by the TRA such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidance and standards. The project is carried out by measuring the level of electromagnetic radiation from telecommunication stations, where 10% of the total stations across the Sultanate will be measured for each licensee. The measurement is carried out in two methods: The first method involves selecting 16 measurement points around the station, being the most exposed to radiation, including 2G, 3G and 4G frequencies.

- In view of TRA's endeavors and commitment to providing telecom services in remote unserved areas, TRA in cooperation with the existing Class I Licensees has successfully put 216 mobile stations ON AIR out of 323 mobile stations, 62 out of these stations were activated in 2017. Furthermore, a joint project between TRA and Omantel to provide home broadband service to some rural areas, optical fiber has been laid, connecting 7 areas. The service now is available for the following areas:
  - Rakyout in Dhofar
  - Dhalko.ut in Dhofar
  - Hitam in AL Wusta
  - Dhahar in Al Wusta
  - Sougrah in Al Wusta
  - Al Fulaig in Sharqya South
  - Tahwah in Sharqya South

- The TRA accredited the sixth registrar for the country's code, top-level domain of Sultanate of Oman (.om), and its Arabic domain. TRA by launching this project is aiming to reflect the Omani identity and promote Arabic content. It also aims to provide better security for domain names information as registration is carried out by accredited registrars in Oman.

- The national awareness campaign to combat online fraud ("Don't Be Deceived") was launched with participation from a number of government and private entities.

- TRA Oman collaborated with SAMENA Telecommunications Council to prioritize digital transformation and emerging issues and challenges

in digital development, to support the national ICT vision. TRA Oman was the Patron for SAMENA Telecommunications Council's Beyond Connectivity Conference in Muscat. (March 16, 2017).

• The TRA announced the floating of a tender document for the provision of consultancy services to the TRA on the renewal of the Class I Public Mobile Telecommunication Services licenses.

• The TRA further reduced roaming rates for voice calls, mobile data and, SMS services. This is in line with the initiative of the GCC regulators - under the umbrella of the GCC General Secretariat - to regulate the prices of roaming services within the Gulf countries. The new price caps became effective in April 2017. The first roaming regulation issued in 2010 covered only voice calls made while roaming and was implemented gradually over a two-year period, with full implementation in February 2012.

• Within the context of its ongoing efforts to create a regulatory environment that is conducive to effective competition in the telecommunications sector, the TRA held a 3 days meeting with the telecom licensees during the period March 6-8, 2017 to discuss certain aspects of the draft Reference Access and Interconnection Offers (RAIO) that were prepared by Omantel and Ooredoo on the basis of the Access and Interconnection Regulation requirements so as to be issued and published in their final format by the licensees dominant in wholesale markets.

• The TRA conducted a field survey to measure the performance of mobile telecommunications networks of Omantel and Ooredoo at Muscat. The network performance was measured using an automated system to monitor 'Quality of service (QoS) and Internet speed', which is a standard tool used globally to measure Key Performance Indicator (KPI) of mobile telecommunications QoS and all the

data related to signal strength and coverage of mobile networks using G2, G3 or G4. (February 15, 2017)

• Within the framework of the bilateral cooperation between the Telecommunications Regulatory Authority of the Sultanate and the Telecommunications Regulatory Authority of the Kingdom of Bahrain, HE Dr. Hamad bin Salem Al Rawahi, Executive President of the Telecommunications Regulatory Authority (TRA) received HE Mohammed Bin Hamad Bubeshait, Director General of the Telecommunications Regulatory Authority in the Kingdom of Bahrain And the delegation accompanying him, in TRA Oman Headquarter. The visit came as a continuation of the existing cooperation between the two bodies, with the aim of enhancing and developing the ties of cooperation and exchange of views and experiences between the two parties in the regulatory fields of common interest that concern the telecommunications sector in both countries.

Telecommunications Regulatory Authority - Bahrain

H.E. Sheikh Nasser Bin Mohamed Al-Khalifa
Acting General Director
TRA - Bahrain

Telecommunications Regulatory Authority
Kingdom of Bahrain -

Regulatory Achievements and Highlights during 2017

- TRA published:
  - Traffic Management and Pricing Practices Guidelines. These Guidelines are intended to: Create awareness about what rights subscribers and users have when using an Internet access service; To give operators a clear understanding of the conduct that will be considered acceptable and reasonable in terms of traffic management policies and practices and pricing practices; To indicate how the Authority intends to supervise compliance by operators and take enforcement action when appropriate.
  - Consumer Protection Regulation. The objectives of this Regulation are to: empower Consumers to make informed decisions; and establish the rights of Consumers and the corresponding obligations of Licensed Operators.

- TRA won CommsMea's "Regulatory Initiative of the Year" Award for 2017 in the 12th edition of the annual CommsMEA Awards on November 20, 2017 in Dubai - UAE. This award, won by TRA Bahrain comes in acknowledgement of the Authority's efforts that has demonstrated the greatest commitment to developing a healthy, safe and competitive market. The Authority's first award for Regulatory Initiative of the Year comes as a hard-earned win amongst prominent rivals in the region such as the TRA's of the UAE, TRA Oman and CITC Saudi Arabia.

- Telecommunications Regulatory Authority (TRA) Bahrain was announced as the winner of the "Best Nationalization Initiative in the GCC" at the 2017 GCC GOV HR Summit in Abu Dhabi. The Summit brought together over 250 C-level executives and senior HR professionals from the government sectors and state owned entities of the region in what is regarded as the Middle East' foremost event dedicated to redefining the human capital function in public sector organizations in the last five years. TRA Bahrain won this award on the basis of implementing innovative policies and procedures towards recruiting national talent with a vision and equal focus of building a focused talent pool to cater to industry requirement.

- TRA facilitated mobile operators' move towards the National Telecommunications Plan vision for a single network for the Kingdom of Bahrain. TRA chaired a key meeting with Batelco, Viva, and Zain on October 19 to discuss the development of technical solutions between Batelco and the mobile operators that will allow consumers to benefit from better quality mobile services. The TRA is developing a new economic regulatory framework to support and promote the Fourth

National Telecommunications Plan, by defining the rules and obligations for operators to support the Plan's goals and deliver the single network policy.

- Percentage of individuals using internet in Bahrain has grown to 98%, according to TRA's latest Survey. Bahrain ranked 2nd globally for internet users according to the World Economic Forum's Report. TRA published its latest Telecommunications Services Residential Market Survey report.

- "Radio Frequency Emissions in Bahrain are within international safety limits" according to TRA. As part of the TRA efforts to ensure public safety and address consumer concerns regarding the safety of radio frequency emissions; TRA acquired specialized equipment to measure the ambient level of emissions produced by radio-communications stations of telecoms operators within the kingdom. These measurements are then compared to guidelines set forth by the International Commission on Non-Ionizing Radiation Protection, or (ICNIRP).

- TRA's Mobile Network Audit for 2017 Underway: Workshop held with operators on Quality of Service Measurements. The purpose of the workshop was to highlight to mobile operators the methodologies that TRA will undertake in their upcoming Mobile Network Audit, the results of which will be included in the TRA's Annual Mobile Quality of Service Report which is expected to be published before the end of the year.

- TRA Board of Directors hail NTP4 Project progress in their second meeting. During the meeting, Board members discussed key issues related to the telecommunications sector in; praising TRA's outstanding efforts in the development and growth of the telecommunications sector in the Kingdom of Bahrain, in particular the significant efforts made by TRA contributing to the progress of the projects related to the Fourth National Telecommunications Plan (NTP4) which is a step towards achieving the vision and policy of Bahrain's leadership. The projects are considered important to address consumers' concerns which play a substantial role in promoting consumers' welfare.

- Bahrain Achieved 'Maturity Stage' in ITU Global Cyber Security Index. The index measured the cyber security commitment levels of all 193 ITU state members based on five key pillars ranging from legal, technical, organizational, to capacity building and cooperation.

- TRA holds workshop in preparation for 5G. In preparation, for the upcoming 5G of mobile networks (5G). TRA published a position paper named "Fixed Point to Point links" in collaboration with relevant government authorities. Subsequently, TRA called for a workshop in the presence of telecommunications operators, relevant government entities and manufacturers of telecoms equipment in addition to a number of TRA employees to discuss the position paper and operators' with regard to the 5th generation services which will facilitate the eminent deployment of 5G networks.

- TRA has issued a 'Critical Telecommunications Infrastructure (CTI) Risk Management Regulation'.

The regulation is a major step towards ensuring that the Telecom services are secure and resilient. This regulatory measure requires Telecom Operators to adopt international best practices for Cyber Security, Business Continuity and Incident Response to ensure that the Critical Telecommunication Infrastructure is adequately prepared against security risks and threats.

- TRA was awarded the "Employer of the year award" in the public sector for the Middle East & North Africa region (MENA) for the second year in a row. TRA received the award at the 12th Human Capital Forum MENA which was held in Dubai on April 30, 2017, where institutions and organizations from around the region came together to recognize excellence in Human Resource Management and discuss the latest trends and best practices in the field of HR.

- As part of the collaboration with the GCC countries, the TRA announces that citizens across the six nations will enjoy further price reductions on roaming rates as of April 1, 2017. This marks the second year of price reductions, and will continue with further reductions every year, until 2020. The Roaming Regulation began with the GCC Ministerial Committee's first decision in 2010, when the need arose to address the high costs of roaming that consumers were exposed to. This lead to the formation of the Roaming Working Group, represented by regulators from each Gulf country and spearheaded by TRA Bahrain with the goal of enriching the lives of its residents and citizens with a solution for more accessible roaming services.

Information And Communication Technologies Authority (ICTA) - Turkey

Regulatory Achievements and Highlights during 2017

- The "Strategic Products Support Protocol" was signed between The Information and Communication Technologies Authority (ICTA) and KOSGEB in order that the efforts to promote domestic and national production in Turkey could be transformed into a cooperation among the institutions on November 30. Minister of Transport, Maritime Affairs and Communications, Minister of Science, Industry and Technology, Chairman of ICTA, Chairman of KOSGEB and the sector representatives attended the "Strategic Products Support Program Introductory Meeting and Protocol Signing Ceremony". ICTA Chairman Dr. Ömer Fatih Sayan said that they had signed a protocol with KOSGEB in order to ensure that the efforts to support domestic and national production in Turkey could be transformed into a business alliance among the institutions. Recalling that Turkey recently launched an initiative on all areas in terms of domestic and national, Dr. Sayan expressed that ICTA's activities as a part of it are to provide the percentage limits of domestic and national products in the telecom sector.

- The 10th International Conference on Information Security and Cryptology was organized by ICTA, on "Cyber Security and Artificial Intelligence". The event brought academics, businesspersons, students and politicians to work on this field. Prime Minister, Minister of Transport, Maritime Affairs and Communications, Chairman of ICTA talked in the event. HAVELSAN, ASELSAN, Türk Telekom, Vodafone, Turkcell, Google, Siemens, Innovera, Huawei and many important company Executives and Engineers joined the panels and events.

- International Workshop on TeraHertz Communication Technologies was organized jointly by ICTA, Japan National Institute of Information and Communications Technology (NICT) and Istanbul Medipol University, at ICTA Headquarters on October 13. TeraHertz bands were discussed in terms of information and communication technologies in the workshop. It is expected that the Terahertz bands could offer significant solutions in the long term at 5G and beyond. Preparations for the technologies which shape the next decades and importance of long-term planning were emphasized on workshop. Also cooperation between Japan and Turkey on TeraHertz Communication Technologies, as well as new generation networks and technologies were discussed.

H.E. Dr. Ömer Fatih Sayan
Chairman
ICTA - Turkey

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KURUMU

- The Digital Games Workshop within the scope of International Child and Data Security Activities was realized at the ICTA Headquarter in Ankara on October 10. Chairman of ICTA Dr. Ömer Fatih Sayan said that we have to buy as much share as in the world market of the digital game sector, we have to produce and market as much as we have consumed. The total volume of the digital games is $ 775 million in Turkey and with the right support policies, our country has the ability, background and capacity to experience a major expansion of the digital gaming industry. ICTA is ready to support domestic game producers.

- The "5G Valley Open Testbed Cooperation Protocol" was signed with all parties at the 17th anniversary event of the Information and Communication Technologies Authority on August 15. President of Middle East Technical University (METU), Prof. Dr. Mustafa Verşan Kök, President of Hacettepe University Prof. Dr. A. Haluk Özen, President of İhsan Doğramacı Bilkent University Prof. Dr. Abdullah Atalar, Vodafone General Manager Colman Deegan, Turk Telekom Executive Vice President Cengiz Doğan and Turkcell General Manager Kaan Terzioğlu attended the event. The Chairman Dr. Ömer Fatih Sayan speaking at signature ceremony of "5G Valley Open Testbed Cooperation Protocol" said, "We crown our 17th year with the "5G Valley Open Testbed." Our target as ICTA; to make our country exist in this race as one of the first countries that have met with 5G in the world, and in doing so to carry our country from the position of consumer to producer.

- ICTA represented Turkey at the 2017 meeting of the International Telecommunication Union (ITU) Council. The Council acts as the Union's governing body within the framework of its assigned responsibilities in the interval between Plenipotentiary Conferences, the supreme organ of the ITU. Turkey has been a Member State of the ITU Council continuously since 2002 from Region B, Western Europe. ICTA declared Turkey's candidature for the ITU Council membership for the period of 2018-2022 at the elections during the Plenipotentiary Conference to be held in Dubai, United Arab Emirates between 29 October-16 November 2018.

- 11th International Electronic Communications Regulators Conference took place in Ankara on 3-4 May 2017. The Conference which has been organized by ICTA since 2006, was held with the theme of "5G and Beyond" and brought together more than 300 participants including officials of various regulatory authorities from different countries, representatives of local operators and international organizations in the field of electronic communications. The conference served as a perfect platform for the participants for information and experience exchange.

- Automotive Sector is one of the sectors that will use 5G technology most, in this context Automotive Sector Workshop about on the way to 5G was held by ICTA on May 11, 2017. Chairman of ICTA Dr. Ömer Fatih Sayan attended Automotive Sector Workshop on the way to 5G that was held within the scope of the 5GTR Forum studies. Various representatives from the automotive sectors, information experts and representatives of universities and related non-governmental organizations participated in the workshop. "Smart Vehicle Demo" demonstration was held within the scope of the workshop which were discussed the trends, works, plans and difficulties related to 5G automotive vision.

- ICTA hosted the Workshop on Next Generation Communications System "5G" organized jointly with the Ministry of Internal Affairs and Communications of Japan (MIC) in Ankara. Besides high-level management and experts from ICTA, a Japanese delegation composed of representatives of MIC, 5GMF, NTT DOCOMO and Japanese Embassy in Ankara, members of 5GTR Forum as well as representatives of Turkish ICT sector and academia participated in the workshop. Opening speeches were delivered by the Chairman of ICTA Dr. Ömer Fatih Sayan, Chief Adviser to the President of Turkey Prof. Dr. Davut Kavranoğlu, and Director General of Telecommunications Bureau of MIC Mr. Masahiko Tominaga.

- In order to encourage the spread of mobile infrastructure and use of M2M technology; with an amendment in the Electronic Communications Law no. 5809, frequency usage fee for base stations will be collected as 5% of the net sales of mobile operators. In addition, mobile M2M terminals and subscriptions will be exempt from frequency license and usage fee as of 1.1.2018.

Telecommunications Regulatory Commission (TRC) - Jordan

H.E. Eng. Mr. Ghazi salem Al-joboor
Chairman
TRC - Jordan

Regulatory Achievements and Highlights during 2017

- Jordan and the World Economic Forum (WEF) launched a new platform project called "Jordan Internet for All", which aims to bring Internet access to millions of Jordanians, including women and isolated communities for the first time through new models of public-private collaboration, a senior government official said. The project, which is aligned with Jordan's Digital Transformation Strategy, will focus on addressing the barriers that prevent universal Internet access, in particular promoting demand for Internet use TRC is leading one of the working groups of the "Jordan Internet for All" project , the group "Digital Transformation of the Society" started analyzing the barriers of implementing digital services in Jordan and will discuss opportunities to push society digital transformation, all groups will report to a steering committee that will monitor the groups' process.

- The board of commissioners adopted the draft instructions for regulating licensing; accreditation, auditing, monitoring and organizing the certificate authorities and legally authorized bodies who wish to provide electronic authentication services in the Kingdom. TRC launched the draft instructions for public consultation and published on TRC's website.

- The TRC started work on developing a centralized database to gather together the coverage details of all of the nation's fiber-optic networks. The database will be published online as an aid for investors, operators and government agencies, with the hope that the resource will help maximize investment by limiting the duplication of infrastructure and encouraging network sharing. The move forms part of the TRC's strategy for accelerating the deployment of next generation infrastructure, which the regulator sees as essential for the development of the nation's economy and to improve quality of life in the Kingdom.

National Telecommunication Regulatory Authority (NTRA) - Egypt

**Eng. Mostafa Abdel Wahed
Acting Executive President
NTRA Egypt**

Regulatory Achievements and Highlights during 2017

- NTRA issued a number of licenses in order to develop the Egyptian telecom market. These included:
  - A license to Telecom Egypt to be Egypt's fourth mobile operator
  - Licenses to Etisalat Misr, Orange Egypt, Vodafone Egypt, and Telecom Egypt to provide 4 G services
  - Licenses to Etisalat Misr, Orange Egypt, Vodafone Egypt to provide the virtual fixed-line services

- The development of the telecom infrastructure through the establishment of several smart cities within the framework of the national strategic projects, most importantly, the establishment of the New Administrative Capital, the New El Alamein City and East Port Said City through the following mechanisms was started with the NTRA's efforts:
  1. Issuance of a modern code for the design and construction of communication networks in various buildings by using optical fiber technology.
  2. Establishment of the design basics for the integration of the telecom infrastructure network with the facility management networks and the security monitoring network as cooperation is consolidated between NTRA and the New Urban Communities Authority and the consultant engineers' offices.
  3. The technical review and approval of the designs of the basic telecommunications network to ensure that they meet the standards for the establishment of smart cities infrastructure.
  4. The launching of a training program for the Egyptian manpower to establish, operate and maintain optical fiber networks in cooperation with the Information Technology Industry Development Agency (ITIDA).

- The purchase and operation of the 4G technology specifications testing system for mobile devices and tablets, which has been recently launched. This system is considered the world's most advanced technology and the first in the Middle East and Africa, as it tests all 4G bandwidths and all other specifications of data transfer protocols.

- The purchase and operation of the health safety testing system of mobile phones and tablets, which is the most modern system worldwide and the first system in the Middle East and Africa. It will ensure that mobile phone shipments comply with the approved international standards, not to mention the support of the local manufacturing by providing the needed tests during the pre - industrial stages at affordable prices.

- NTRA hosed 6th meeting of the African Internet Governance Forum 2017 (AFIGF2017) in the period from December 4 to 6 in Sharm El Sheikh, Egypt. The Forum aim was to act as a platform and podium for comprehensive multilateral dialogues and discussions on Internet-related issues in Africa in general and Internet governance issues in particular. The African IGF (AFIGF) has specific objectives that it aims to achieve, mainly, raising citizens' awareness of internet governance and boosting capacity building for the internet governance for African users to ensure that all stakeholders contribute and interact therein. In addition, the AFIGF is exerting all efforts to ensure that the concerns and interests of African countries are taken into account in the internet governance process in a way that promotes a dialogue model among all stakeholders on Internet governance in Africa through regional and national forums.

- Within the framework of the ITU Standardization Sector (ITU-T), NTRA participated in 12th meeting of the Arab Standardization Team (ASTeam) in Riyadh, Kingdom of Saudi Arabia. Due to the significant role standardization has been playing in the ever-developing telecom sector that necessitated the conformity of telecom systems and their fulfilment of the end user's needs, the League of Arab States established the ASTeam in 2007 as one of the specialized teams. In this regard, ASTeam) aimed to boost the relationship between the officials in the Arab departments and administrations and ITU standardization sector. This required the implementation of this sector's recommendations in the Arab region,

and the enhancement of the technical capabilities of the standardization officials in the Arab administrations, and the exchange of expertise through the ASTeam's activities in addition to the participation of Arab administrations in the works of the study groups and their encouragement to submit joint working papers and the active participation in their meetings.

- Within the framework of the efforts exerted by the Egyptian Computer Emergency Readiness Center (EG-CERT) to monitor and follow up on cyber attacks by participating in the latest cyber-related events to strengthen relations with relevant international organizations and bodies, EG-CERT participated in the 2nd FIRST-ITU Regional Symposium and the 4th Applied learning for Emergency Response Teams (ALERT) cyber drill for Africa and Arab Regions in the period from November 13-17, 2017 in Dar es Salaam, Tanzania. The events were hosted by Tanzania Communications Regulatory Authority (TCRA). The EG-CERT hosted the first edition of FIRST-ITU Regional Symposium last year in Sharm El Sheikh.

- The regulator, within the framework of its mandate to monitor the operators' compliance with their licences terms and conditions, issued 'The Penalties Regulation" which includes the measures and procedures that NTRA is entitled to take and the penalties it can impose against any violations committed by these operators. This regulation was approved and reviewed by the State Council's Legislation Department.

- NTRA took measures needed to cease and ban the sale of mobile lines with

unknown or incorrect data, as this practice is sometimes caused by neglect and at other times is committed deliberately by some mobile phone vendors. The actions taken by NTRA during the years 2014 to 2017 hindered the increase in the mobile phone lines that was expected then to rise to 185.5 million lines. Hence, the total number of mobile lines with correct database reached 99,7 million lines by the end of October 2017 as more than 86 million unscrupulous and illegal line were apprehended in the market. Moreover, the database of about 29,6 million lines was updated by the end of October 2017.

- The fixed and mobile broadband internet market witnessed an increase of 11.5% for fixed internet services and 10.5% for mobile internet in the period from 1st January 2017 to September 2017. The number of fixed internet subscribers amounts to 4,952,294 subscribers and the number of mobile internet subscribers amounts to 32,763,480, while mobile subscribers and the number of Internet subscribers via USB modem is 3,274,320.

- NTRA followed up on the coverage plan of the Strategic Roads Network for Sustainable Development, where around 2250 km of new roads in the National Roads network were covered by mobile services and work is underway to cover 5,700 km with mobile services.

- NTRA implemented a pilot project of the National Broadband Plan, which aims to provide high-speed Internet service in a number of entities, affiliated to several ministries.

Pakistan Telecommunication Authority (PTA)

Abdul Samad
Acting Chairman
PTA - Pakistan

Pakistan Telecommunication Authority

Regulatory Achievements and Highlights during 2017

- Pakistan was declared winner of the "GSMA Government Leadership Award 2017"

- PTA joined hands with Internet Society (ISOC) Asia-Pacific Bureau and COMSATS Internet Services Limited to provide online interactive remote education to 6th grade students of a Government Girls High School in rural areas; connected last year as part of ISOC's Wireless for Communities (W4C) program.

- The Advisory Committee for the Auction of unsold Next Generation Mobile Services (NGMS) spectrum (4G) issued the Policy Directive for the auction of 4G spectrum. Jazz submitted the bid to win the offered spectrum and after completing all due formalities, the operator was declared winner of the auction at the base price of US$ 295 million. The auction had brought in one of the largest foreign exchange investments compared to any other sector.

- After coordinated efforts of PTA and telecom industry, withholding tax was brought down to 12.5% from 14% in the federal budget for FY 2017 – 18.

- To encourage debate on policy and implementation, Pakistan Telecommunication Authority (PTA) in collaboration with Ministry of Information Technology, Internet Society Asia-Pacific Bureau, Higher Education Commission of Pakistan and Special Talent Exchange Program organized the "Pakistan Digital Forum". The aim of the forum was to bring together the policy maker, the regulator, telecom operators, relevant stake holders, regional experts, and researchers on a common platform to deliberate on the policy and implementation strategies on Pakistan's current and future digital landscape.

- The number of 3G and 4G users in Pakistan reached 47.204 million by end-November 2017 with 143 million Cellular Mobile subscribers, 50.6 million Mobile Broadband Subscribers, 70% Mobile broadband coverage, 18 million Smartphone users, 24.48% Internet users, 1.56 GB average mobile data usage per subscriber per month

- PTA is all set to introduce the new system called Device Identification, Registration and Blocking System (DIRBS) to counter the increasing number of mobile phones snatching and stealing incidents, usage of non-standard/ non-type approved mobile phone handsets and mobile smuggling in the country

- To boost further growth and performance, PTA is working on Spectrum Reframing Framework that will enable PTA and FAB to introduce new technologies in the country.

Afghanistan Telecom Regulatory Authority (ATRA)

Dr. Mohammad Najib Azizi
Chairman
ATRA - Afghanistan

Regulatory Achievements and Highlights during 2017

- Afghanistan Telecom Regulatory Authority (ATRA), in accordance with the provisions of Telecom Law amended in 2017, is an independent and highest level authority in regards to telecom sector in the country. ATRA has envisioned bringing 50 percent of Afghanistan's population online by 2021. Therefore, in consultation with stakeholders it has undertaken a number of innovative regulatory steps to provide a conducive environment to the mobile and internet operators to promote broadband services across the country and develop new digital trends.

- In 2017, ATRA successfully implemented the Open Access Policy - that there should be open access to national broadband infrastructure and also to allow private investors to build, own and operate their fiber optic transmission networks.

- To promote broadband internet in the market, ATRA also issued a circular to permit all mobile operators provide 4G services in their assigned frequency bands. In order to promote the culture of transparency and accountability, for the first time ATRA signed a contract with an independent audit company to conduct the financial audit of ATRA and universal access fund. Along with the macro-level regulatory initiatives, ATRA has also been proceeding with facilitating the promotion of small and medium scale investments and enhanced value-added services in the country. Today over 100 SMEs operating in the telecom sector are creating jobs and setting new technology trends in services delivery.

- ATRA has further strengthened the institutional efforts with multi-stakeholder approach to develop the telecom market through market friendly regulations, efficient utilization of universal access fund, and solid measures to fight the illegal telecom operations including sim boxes. The regulatory will ensure that the current fiber network owned by the state as the dark fiber will be available to all operators ensuring access on fair, reasonable and non-discriminatory terms.

- ATRA will release additional spectrum to the operators to enable them in launching next generation services. ATRA places priority on the rights of the consumers and therefore is developing policies and regulations to support the disabled and other vulnerable communities in Afghanistan.

- At the regional level, ATRA is working with neighboring countries and international partners to create an enabling environment for sustainable infrastructure investments, and in efforts to position Afghanistan as a strategic hub on the "Digital Silk Road" that connects South, North, and Central Asia with the Middle East.

Telecom Operators, Regulators, and Technology Providers Address Regional Digital Transformation Requirements during SAMENA Council's "Convergence to Kuwait"

Held in Kuwait City in continuation of SAMENA Council's regional digital transformation-centric public and private-sector conferences, the Convergence to Kuwait conference engaged telecom operators, regulators, and technology providers to delve into issues that form the crux of what needs to be done within the digital communications industry to create a new future of ICT policy-making and regulation, to build a sustainable digital economy, and to foster sustainability of the complex, evolving digital ecosystem.

Under the global theme of "Creating New Advantages for Industry Stakeholders", Convergence to Kuwait 2017 was especially relevant to Kuwait's future ICT development plans, and thus was provided with patronage from the State of Kuwait's Communication and Information Technology Regulatory Authority (CITRA), with leading regional telecom operators, including STC, VIVA Kuwait, ZAIN Group, and renowned global technology companies, including CISCO and HUAWEI, taking active part in the discussions. The panel discussions focused on Regulatory Transformation for Fulfilling the Digital Agenda; Data Regulation in View of Emerging Cross-Border Technologies & Pan-National Communications; Stakeholder Preparation for the 5G World - Harmonizing Efforts in Terrestrial, Satellite, and Regulatory Co-operation; and Public Policy Considerations for OTTs as the key areas that will define the industry's focus for 2018 and beyond.

Convergence to Kuwait successfully built on to SAMENA Council's capacity-building and sector-development endeavors in collaboration with regional regulatory bodies. Convergence to Kuwait was also important to SAMENA

Council's member operators, specifically VIVA Kuwait and Zain Kuwait, as both market leaders define a new digital future for the Kuwaiti market, and for the new regulatory body, CITRA, as it prepares to set new regulatory regimes more suited to Kuwait's digital ecosystem.

SAMENA Council's leadership has been very expressive about developing a regulatory environment for the telecommunication sector to cope with the revolution witnessed by the sector in light of digitization trends, and the need to approach the evolving digital future with fresh perspectives. As expressed by the Chairman of SAMENA Council's Board of Directors, Dr. Khaled Biyari, innovation in communications ecosystem is required, which, in significant parts, requires investment for new broadband infrastructure development.

Current legacy sector-specific regulatory regimes are no longer effective in the face of new, continuously evolving industry dynamics. To achieve governments'

digital visions and agendas of creating inclusive smart economies and societies, it is critical for Regulators and Operators to work together, to address issues such as cross-border data flows, which can have direct impact on the speed and realization of potential of digitization. Addressing cross-border data flows by introducing cross-border data protection- and cyber-security frameworks can dramatically impact digital transformation in the region.

It also remains a fact within the industry that there is less clarity and consensus between regulators and the industry on the concrete and relevant 5G future use-cases and the related enablers that need to be in place to achieve the delivery and deployment of 5G services and technologies. Alongside the identification and definition of relevant 5G use cases, key enablers such as data regulation and harmonizing 5G developmental issues (among others) have to be openly discussed and debated.

Another significant realization within the industry has been the growing understanding of a disconnect between global cross-border OTT activities and national regulatory and economic frameworks and commercial activities. This is especially applicable when considering that OTTs want to remain ungoverned whereas operators and (some) governments would like to see the creation of a level-playing field, which requires all digital economy stakeholders to adhere to the "same rules for the same services", to ensure that communication services are secure and safe to use, and that data generated is protected and that consumers have a say in the way that their data is used, and that OTT players make direct contributions in the shape of direct investments in building local economies similar to how to telecom operators do.

With the above perspectives, necessary for creating new advantages for the stakeholders, specific discussion points raised by the speakers included following:

• The ICT sector in any given economy is no longer a vertical. All other sectors are dependent on the ICT sector, given ICT remains at the heart of all socio-economic transformational endeavors throughout the regional economies. As a whole, the industry needs to address four core areas: Digital Services and Digital Transformation, Data Regulation, Spectrum Management, and reduction in Taxation and Industry Fees.

• The new digital economy would have a volume of US$ 60 trillion in the next ten years, and this will have an impact on telecom operators, which are redefining their value propositions, rethinking their portfolios, remodeling their core business, and venturing into new growth business. All of these aspects are important to the digital transformation and the operators' central role in driving it.

• Stability and collaboration are critical requirements for the industry, which can be easily impacted with frequent executive replacements at regulators, changes in governments, and other institutional changes that create a sense of uncertainty. Thus for digital

progress to continue, a sense of predictability must prevail.

• Disruptive businesses and approaches are taking stakeholders out of our comfort-zone. From the policy, regulatory and business perspectives, they need to be understood as they could be wake-up calls for us to do something different. We are moving to the asymmetrical business models and asymmetrical competition frameworks. Failing to address the ICT sector's requirements on time and without including all relevant stakeholders will impact future planning and the speed and sustainability of investment efforts.

• The digital ecosystem is demanding inclusion of all players and requires management through harmonization of endeavors across all fronts and areas. Maximizing efficiency from all stakeholders to solve digital-economy problems is central to future progress. This essentially means making progress on issues on prompt basis.

• Inter-sector coordination is required among various regulators of a country such as transportation ministry, Health care and other government entities.

• Operators to focus on defining all the use cases for 5G applications before deploying the 5G network. The region's spectrum needs should be understood better and the duration of licenses to operate on a spectrum

should be made longer than 15 years for a good return of investment. In the world of data, spectrum requirements merit prioritized collaboration and common positions by operators as well as favorable consideration by regulators.

• Although we should keep the dialogue open at international level about policies around OTT, most of the effective debate can only happen at a national level. New business rules need to be written, including those relating to the regulation of global services that use national telecom networks.

• An important part of setting level playing fields with OTT is to reduce the regulatory burden on telecom operators. However, operators must continue their digital transformation and internal optimization, and should be more innovative in terms of their commercial strategies and define new collaboration efforts with OTT and better monetize big data. Regional national visions, including the New Kuwait vision, require new types of digital services, which will require collaborative innovation.

• Cyber security is already a big challenge, but will become ever more so given our entry into the realms of IoT and AI. There is much need for adopting globalized solutions and practices to counter this challenge as nations are now interdependent.

Speakers of Convergence to Kuwait included

Panel 1:
- Strategy& - Chady Smayra – Partner,
- SAMENA Council - Dr. Khalid Biyari – Chairman,
- CITRA - Waleed Al Qallaf,
- Zain - Scott Gegenheimer - Group CEO – Operations,
- GSMA - Ammar Hamadien - Head of Strategic Engagement,
- SAMENA Council - Bocar BA – CEO

Panel 2:
- AT Kearney Riyadh Derouiche - Senior Manager
- Zain - Dr. Andrew Arowojolu - CRO – Zain
- Huawei - Sami Nashwan -Vice President Strategy
- STC - Nowaf Almutiri - GM Corporate Analytics & Data Governance
- CITRA - Mohammad Altura Chief, Information Technology Sector

Panel 3:
- ADL - Andrea Faggiano – Partner
- Huawei - Dr. Mohamed Madkour - VP Wireless Network Marketing & Head of Global Demand Generation
- Ericsson - Ali Cheema - Government & Industry Relations
- Etisalat - Dr. Abdulhadi AbouAlmal - Director / Technology Standardization & Spectrum Mgt
- Viva Kuwait - Eng. Zarrar Khan – CTO
- Qualcomm - Fabien Migneret -Head of Government Affairs MEA & North Africa

Panel 4:
- Analysys Mason - Johann Adjovi - Principal and Head
- CISCO - Mohamed Bakry - Senior Systems Engineering Manager
- Numbase - Ayman Jomaa – CEO
- TRA Bahrain - Adel Darwish - Head of International Relations
- Orange - Atef Helmy - Senior Advisor MEA & Africa

Convergence to Kuwait reiterated the need for preparedness and prompt actions for progressing forward in the new digital ecosystem, which must be made sustainable, and all stakeholders, including governments, regulators, ICT service providers, academia, research community, consumers and the civil society, should coordinate and collaborate together to create new advantages for each other, and for the end-user.

In the case of Kuwait, which has a new regulatory body, CEO of SAMENA Council, Mr. Bocar BA, believes there exists a great opportunity to lead the frontier of new regulatory paradigms by making forward-looking and flexible regulations that are designed from the ground up and which focus on local value-creation, and take a holistic approach across different economic sectors and digital stakeholders. SAMENA Council looks forward to working closely with CITRA and to supporting ICT visions across the GCC region in all ways possible, while representing the needs and issues of telecom operators and relevant industry stakeholders.

NUMBASE Group becomes Member of SAMENA Telecommunications Council to Define New Trends in Mobile VAS

NUMBASE Group, a renowned name in the VAS sector and a company leading in mobile solutions and innovative offerings, has become the latest member of SAMENA Council, the South Asia - Middle East - North Africa region's non-profit international organization that works closely with the public and the private sectors to voice ICT industry issues and sustainability requirements within the digital ecosystem.

SAMENA Council has confirmed that NUMBASE Group is a strong partnership prospect for its member telecom operators. CEO of the Council, Mr. Bocar BA has stated that "Our industry requires partnerships and collaboration for meeting tough performance challenges. This has become ever more necessary as players within the digital ecosystem seek greater value-creation and anticipate meeting end-user expectations. NUMBASE's extensive experience in achieving sustainable results and understanding the innovation requirements of telecom operators comes as a great value-addition within SAMENA Council's membership. We warmly welcome NUMBASE's leadership and team to help define new VAS agenda among the Council's members."

NUMBASE Group's services range from design, development and implementation of high-end solutions that generate substantial revenues for mobile network operators while maintaining high customer satisfaction. With operations covering the globe from the Americas, to Europe, Africa and Asia, NUMBASE provides mobile network operators with innovative

value added solutions and managed services including: Mobile Music, Mobile Gaming, Fintech services, Entertainment, and user communication solutions.

Sharing NUMBASE's views on joining SAMENA Council, Mr. Ayman Jomaa, Chairman & CEO said "It is our pleasure to Join SAMENA Council, where we strongly believe that the industry and its derivatives are in urgent need of platforms like SAMENA Council to do the proper advocacy Work and re-positioning of the whole ecosystem and process between operators, regulators, service providers and content providers."

Bringing regulators, operators and vendors together, while working toward addressing digital development matters that will define the future of the industry, SAMENA Council constantly seeks partnerships and collaboration prospects for its telecom operator members. By joining SAMENA Council, companies magnify their corporate visibility and develop new business prospects.

Ayman Jomaa, CEO, Numbase Group

About Numbase Group

Numbase Group holds 8 subsidiaries specialized in providing distinguished mobile Value Added Services and Content Solutions to millions of end-users through mobile network operators and digital platforms. We focus on innovation and the value proposition offered to end users by utilizing big data analysis and advanced profiling techniques that create a more personalized experience for every customer ensuring high satisfaction and QoS while adding direct value to the top-line revenues of mobile networks.

In a highly competitive environment,

Numbase leads by utilizing cutting edge technologies and solid industry partnerships allowing the company to gain an extensive experience and remarkable achievements that we aim to share with potential markets. Our team consists of skilled personnel with vast knowledge and experience keeping our mission and vision a stronghold to our growth and success.

Numbase services range from the design, development and implementation of high end solutions, consultations and managed services including: VAS

Solutions, Premium Numbers, 'Connect' Powered by Shazam, Mega Promotions, Loyalty Programs, Ring Back Tone Solutions, Microfinance Solutions, Content Aggregation, and Multimedia & Music Content. The Group is an investor in, and active partner for Shazam entertainment, and an exclusive affiliate of Ring Back Tone services. Numbase is also an investor in Beyond Limits, the only AI Company that is known for transforming proven space and defence technologies from NASA into innovative technology solutions to address emerging industry markets.

Smart cities connecting everyday things for a safe, smart and sustainable environment

Our smart city solutions and service expertise enable pioneering smart city applications to be rapidly created, deployed, expanded and managed, in a secure and reliable way.

Find out more
nokia.com/smartcitites

MEMBERS NEWS

Dr. Khaled Biyari has Been Awarded the Industry CEO of the Year Award

STC Group CEO, Dr. Khaled Biyari has been awarded the Industry CEO of the Year in Dubai. The Award provided by Telecom Review Summit, which homers the best of the ICT/telecom industry with its Excellence Awards annually. "Under his leadership STC has continued to grow and retain profitability", Telecom Review Summit said in a press release. In addition, "Khaled Biyari has made sure that digitization is addressed for the future at STC and that STC will focus on keeping up with the variables of cloud computing, information security, Internet of things, digital financial services, and digital media". It stated.

STC, Thales Launch Enterprise Cloud Encryption Service

Saudi Telecom Company (STC), the largest telecoms company in the kingdom, has joined forces with Thales, a leader in critical information systems, cybersecurity and data security, to launch a cloud encryption service for enterprise customers allowing them to protect and control their data in the cloud. Thales had inked a cloud service provider agreement with STC to provide data encryption solutions through the STC cloud platform and to further develop secured Information Communications Technology (ICT) business in Saudi Arabia. Enterprises are increasingly turning to cloud environments to help them save time and money. While these technologies are digitally transforming businesses, they present some challenges. Enterprise data is fair game for cybercriminals, regardless of operating environment,

and meeting compliance and best practices requirements isn't always straightforward. Vormetric Transparent Encryption from Thales encrypts sensitive data before it leaves the enterprise and is saved in the cloud storage environment, enabling information security teams to establish the visibility and control they need around sensitive assets. This solution ensures that data in the STC public cloud is secure and trusted by delivering seamless high performance encryption, access control and strong key management. Talal Albakr - Vice President Cloud Services at Saudi Telecom Company says: "Digital transformation is at the heart of Saudi Arabia's Vision 2030 for a strong, thriving and stable economy that provides

opportunity for all. Our partnership with Thales is designed to deliver secure and trusted public cloud services to STC customers across the Kingdom and the wider Middle East region, allowing them to establish strong safeguards around their sensitive data and applications in the cloud, satisfying local compliance requirements and providing greater control and flexibility." Philip Schreiber, the regional sales director, at Thales eSecurity Middle East, Africa and South Asia said: "It is a common misconception that by moving to the cloud, businesses are relinquishing all control of their data. By applying encryption and practicing secure encryption key management, companies can ensure that only authorized users have access to sensitive data." "Even if lost, stolen, or accessed without authorization, encrypted data is unreadable and essentially meaningless without its key. STC have selected a best-in-class data encryption solution that not only ensures their customers remain firmly in control of their data but also ensures that data remains secure and trusted in their cloud environment," he added.

Batelco Extends Network to Singapore

Bahraini telecom operator, Batelco has completed extending its network to reach Singapore via submarine cables, the company has announced. Batelco's network extension will guarantee its customers uninterrupted service and better use of international capacities in an important market for the operator, according to ITP Media Group sister publication, CommsMEA. "The APAC region is an important growth area for us and our new provisioning will ensure that our enterprise customers and international carriers will benefit from a reliable end-to-end service offering," said Batelco's chief global business officer, Adel Al Daylami. Batelco has similar initiatives deployed around the globe in 28 locations across the world, helping it retain customers on its network. "Our customers in the Asia Pacific regions are now enabled to reach Batelco's Middle East Network on a highly available network with the shortest latency. Likewise customers in the Middle East will also benefit by a superior service for their communications with APAC countries," Al Daylami said.

Batelco's Development of New Datacenters for ICT & Digital Solutions

Batelco, the Kingdom of Bahrain's leading digital solutions provider, has begun work to build a number of world-class TIER III Datacenter facilities to ensure the highest level of business continuity for the Enterprise and Government sectors. The project is central to the overall Datacenter plan for the Kingdom of Bahrain in line with the Kingdom's vision to be a leading Data Hub in the region. Batelco has embarked on this ambitious project to meet the growing demand from businesses across all sectors for cutting edge colocation services. In today's data intensive business environments, the TIER III facilities will provide higher levels of overall capacity and redundancy to meet the increasing demand for Datacenter and colocation services. Batelco Bahrain CEO Mohamed Bubashait said that Batelco's strategic plans to develop world class Datacenter services and advanced infrastructure are in line with the Kingdom's vision and aspirations to maintain Bahrain's position as a leader in the region's ICT industry and Data economy. "Batelco is developing a number of Datacenters which will form the basis of the infrastructure to enable the growth of enhanced cloud based ICT services and global Data movement. The TIER III Datacenters are designed to extend the very latest in hosting and colocation services alongside Batelco's suite of cloud services to support the enterprise and government segments of Bahrain." "The new Datacenter facilities will enhance the Kingdom's digital infrastructure significantly and further align Bahrain's hosting and colocation facilities with global standards. Batelco is the recognized leader in the Kingdom's ICT industry and continues to lead in the development of relevant infrastructure for the country's future needs. Such provisioning also helps to position Bahrain as a regional Data hub of choice for international businesses," Mr. Bubashait added. Batelco's Datacenter facilities are already highly regarded and businesses that host their equipment with Batelco are guaranteed to benefit from the most resilient, secure, and advanced hosting services in the Kingdom, supported by the Company's Network Operations Centre (NOC) which is available 24/7. Furthermore, customers benefit from reliable product and service support along with flexible payment terms.

Etisalat Unveils White Paper on Cloud Development

Etisalat in association with professional services firm Deloitte and ICT company Huawei has launched a joint White Paper entitled "From Pipelines to Clouds -Etisalat`s Playbook". The White Paper shares lessons learned in how technologies combined can elevate telcos' capabilities to revamp their business and also provides a point of view on the road towards a cloud-native telco, ultimately making a contribution to the telecommunication industry. The launch of the White Paper "From Pipelines to Clouds-Etisalat`s Playbook" is part of a collaboration made amongst the three companies for a joint innovation program focused around multiple exponential technologies that constitute a digital transformation journey from a technology perspective. The companies believe that a future Telco Cloud will require different telecom networks` infrastructure and system architecture to address customers' digital needs in order to deliver intelligent, quicker, more reliable value added services. Hatem Bamatraf, Chief Technology Officer at Etisalat Group said: "Cloud computing presents unique opportunities for Etisalat to attain sustainable growth

in the emerging digital ecosystem. Our aim is to deliver a differentiated service experience to empower a digital and happier society. This new, opportunity-rich landscape calls for collaboration with diverse industry players focusing on open and agile operating and organizational models. Those who have yet to start this journey must start now and respond boldly with the right strategy!" "Network transformation is a valuable opportunity to offer differentiated digital experience with agile network and automated operations. Huawei is fully committed to assist Etisalat on this digitalization journey and would feel privileged to work with Etisalat to help them achieve their goals," said Peng Xiongji,

President Etisalat Key Account Huawei Technologies. "At Deloitte we believe that digital transformation is not only about technology; deep transformations happen in Telcos at multiple dimensions in order to revamp their business. The transformation journey must be travelled gradually to harvest benefits along the way, as a big bang approach has a lower probability of succeeding. That being said, this paper focuses on the technological perspective, since it represents the foundation to support all other dimensions, which are part of this transformation," said Pedro Tavares, partner, Deloitte Portugal, and Leader of the Engineering Centre of Excellence (CoE). The White Paper underlines the

vision of the Etisalat Group to harness its technological vision and key industry advances and provide innovative premium and differentiated service experiences for customers. The adaption of new architecture and processes outlined in the White Paper will enable the Etisalat Group to devise a practical road map for the adaption of SDN and NFV technologies in addition to cutting-edge technology such as MEC, AI, Machine Learning, and 5G. The company will develop a cost effective infrastructure, which will provide Etisalat with new innovative products/services and with enough time to market them, a statement said.

Etisalat Successfully Deployed the First Regional Pre-Commercial 5G

Etisalat in association with professional services firm Deloitte and ICT company Huawei has launched a joint White Paper entitled "From Pipelines to Clouds -Etisalat`s Playbook". The White Paper shares lessons learned in how technologies combined can elevate telcos' capabilities to revamp their business and also provides a point of view on the road towards a cloud-native telco, ultimately making a contribution to the telecommunication industry. The launch of the White Paper "From Pipelines to Clouds-Etisalat`s Playbook" is part of a collaboration made amongst the three companies for a joint innovation program focused around multiple exponential technologies that constitute a digital transformation journey from a technology perspective. The companies believe that a future Telco Cloud will require different telecom networks` infrastructure and system architecture to address customers' digital needs in order to deliver intelligent, quicker, more reliable value added services. Hatem Bamatraf, Chief Technology Officer at Etisalat Group said: "Cloud computing presents unique opportunities for Etisalat to attain sustainable growth in the emerging digital ecosystem. Our aim is to deliver a differentiated service experience to empower a digital and happier society. This new, opportunity-rich landscape calls for collaboration with diverse industry players focusing on open and agile operating and organizational models. Those who have yet to start this journey must start now and respond boldly with the right strategy!" "Network

transformation is a valuable opportunity to offer differentiated digital experience with agile network and automated operations. Huawei is fully committed to assist Etisalat on this digitalization journey and would feel privileged to work with Etisalat to help them achieve their goals," said Peng Xiongji, President Etisalat Key Account Huawei Technologies. "At Deloitte we believe that digital transformation is not only about technology; deep transformations happen in Telcos at multiple dimensions in order to revamp their business. The transformation journey must be travelled gradually to harvest benefits along the way, as a big bang approach has a lower probability of succeeding. That being said, this paper focuses on the technological perspective, since it represents the foundation to support all

other dimensions, which are part of this transformation," said Pedro Tavares, partner, Deloitte Portugal, and Leader of the Engineering Centre of Excellence (CoE). The White Paper underlines the vision of the Etisalat Group to harness its technological vision and key industry advances and provide innovative premium and differentiated service experiences for customers. The adaption of new architecture and processes outlined in the White Paper will enable the Etisalat Group to devise a practical road map for the adaption of SDN and NFV technologies in addition to cutting-edge technology such as MEC, AI, Machine Learning, and 5G. The company will develop a cost effective infrastructure, which will provide Etisalat with new innovative products/services and with enough time to market them, a statement said.

Etisalat Enters into a Strategic Partnership with Gulf Data Hub

Etisalat announced its exclusive strategic long-term wholesale lease agreement with Gulf Data Hub to acquire the full capacity of its Tier III data center to provide datacenter services to private enterprises, government entities and cloud service providers. Gulf Data Hub, part of the UAE based Al Ashram Group claims to be UAE's first carrier and vendor neutral data center facility designed to meet international standards providing equipment room space for its customers data center equipment. The hub consists of two custom-built buildings comprising of 3000 sqm of data space each, located at Dubai Silicon Oasis. Under this 15-year agreement, Etisalat will have the complete rights to the space at the data center

and can lease out to partners requiring colocation and cloud facilities. Gulf Data Hub is the 10thdata center facility commercialized by Etisalat positing it as the leading data center colocation and cloud provider in the region. Speaking on the agreement, Salvador Anglada, Etisalat Chief Business Officer said: "We are excited about today's agreement as it's a major achievement for Etisalat in the colocation and data center industry. This agreement gives our customers wider options in terms of flexibility and capacity. With Etisalat, working closely with its customers in moving to the digital future, data centers form an integral part of this business and provides the platform for future growth. This partnership is a

testimony to our commitment to help our customers in their digital transformation journey." Tarek Al Ashraf, Gulf Data Hub CEO, said: "We are delighted to have signed an agreement with Etisalat, the undisputed leader of ICT and Digital services in the UAE. GDH is committed to providing the latest in cutting edge digital datacenter technology and views this partnership as an important stepping stone on our quest to expand into the regional digital space" The GDH facility in Dubai Silicon Oasis has two phases, a first one with 4.2MW of IT whitespace with immediate available capacity, and a second one of 6MW.

Omantel Launches DCB service with Google

Omantel, the first provider of integrated telecommunications services in the sultanate, has announced the launch of a direct carrier billing service with Google, to make it easier for Android users to purchase apps, games and digital content on their devices. With the introduction of direct carrier billing with Google, customers can now perform any online purchase transaction through the Google Play Store by paying for their purchases via their mobile phone balance without

using their credit cards. Direct carrier billing allows users of select mobile operators to pay for digital content on Google Play by billing purchases to their mobile accounts - postpaid or prepaid. Customers interested in accessing Omantel Google Play Direct Carrier Billing (DCB), must visit 'Account' in Google Play settings, proceed to 'Payment Method' and 'Enable Carrier Billing'. They can then enter their name, address and mobile number for billing, and then click 'Accept'.

Once accepted, they will be able to view the carrier billing option for payment, and start purchasing with 'Omantel Billing'. Saleh Mahmood al Maimani, senior manager, Product Development Consumer at Omantel's Consumer Business Unit, said, "Omantel is pleased to launch the direct carrier billing service with Google. This initiative is part of the strategy to use resources, and capabilities to enhance digital access for its customers.

VIVA Covers More With its Retail Expansion

VIVA, Kuwait's fastest-growing and most developed telecom operator, announced the continuation of its expansion plan to open new locations mainly in the cooperative societies, to be closer to its customers. VIVA has recently inaugurated 24 new branches in the cooperative societies throughout all Kuwait's governorates and a new branch at Sultan Center at The Promenade Mall in Hawally area. All these new branches joined VIVA's new branch network in Kuwait to cover all

residential areas. Commenting on this occasion, Mr. Abdulrazzaq Bader Al-Essa, Corporate Communications Director at VIVA said: "For us at VIVA, we differentiate ourselves by maintaining superior levels of customer experience, customer service and continued expansion of our network. Our strategy revolves around relevance and convenience to our customers. This specific achievement is part of our persistent focus on expansion and investment in the right areas." He added:

"VIVA aims through these new branches to be closer to its customers and provide them convenience, satisfy their needs and requirements and keep them posted regularly with the latest VIVA products and services." In addition to our branch services, VIVA's customer care line at 102 is ready round the clock and up to public holidays, to provide outstanding service to our valued customers through a team of specialties."

VIVA Bahrain Inks Deal with KFH to Acquire Menatelecom

VIVA Bahrain, a fully owned subsidiary of the Saudi Telecommunications Company (STC) announced signing a definitive agreement to buy 100 per cent stake in Menatelecom, a wholly owned subsidiary of KFH-Bahrain. The transaction is expected to be completed in early January 2018. Terms of the deal were not disclosed. "It is time to exit to an industry player like VIVA which is a very capable telecom player not only in Bahrain but across the region," said Managing Director and CEO of KFH-Bahrain, Abdulhakeem Al-Khayyat, commenting on the deal. "Not only Menatelecom has a valuable asset, but also, more importantly, a capable human resource team which competed well in a highly competitive market and, therefore, I would like to thank them for their efforts during KFH's investment tenure," he added. The acquisition, VIVA Bahrain's CEO Ulaiyan Al Wetaid said, will significantly enhance its position in both the consumer broadband and enterprise markets. "While we have achieved strong and sustainable growth in the Kingdom of Bahrain over the past seven years,

Menatelecom's successful position in the home broadband segment will be a key growth driver for VIVA," he added. VIVA, which launched its commercial services in March 2010, celebrated its seven years of success in Bahrain recently. The company is also the first operator in Bahrain to provide speeds of up to 42 Mbps to its broadband subscribers and to test successfully and showcase its 4G/LTE network in early 2012, officially

launching 4G/LTE services to customers in January 2014. Established in 2003, Menatelecom provides a full spectrum of telecommunication solutions which include a comprehensive array of IP Telephony services, High-Speed Internet, and Data Services using state-of-the-art 4G Long Term Evolution (LTE) technology. The company says it offers broadband internet services to over 80,000 subscribers.

VIVA Bahrain Deploys Routing Platform Powered by Noction

VIVA Bahrain has achieved another network breakthrough with the successful deployment of the world's first Intelligent Routing Platform (IRP) powered by Noction, provider of network routing software. The upgrade allows it instantly to screen thousands of internet destinations and intelligently reroute inbound and outbound traffic based on quality-focused metrics in a matter of seconds. The system is designed to

optimize the internet's standardized Boarder Gateway Protocol (BGP) decision-making process. It examines all available internet routes for critical network performance indicators such as latency and speed consistency, as well as other important factors such as capacity, current usage and historical reliability of the routes. Following the live scan, web traffic is immediately routed through the path identified as best, bypassing

congestion and outages, enhancing service on latency-sensitive applications such as e-commerce, VoIP & media streaming, and minimizing network downtime. It provides analytics as well as instant insights. The Noction-powered service comes as a second layer upgrade to VIVA's new Customer Excellence Centre, with live dashboards that detect degradations in services even when there is no technical fault in the grid.

Accenture Pledges Thousands of Hours to Bring Coding to Students with 'Hour of Code' Activities

Accenture employees across 56 countries have pledged to complete more than 10,000 Hours of Code and lead coding tutorial sessions around the world during Computer Science Education Week, December 4-10, as part of the company's commitment to helping students around the world build computer and science, technology, engineering and math

(STEM) skills. This year Accenture is leading with the talent and energy of our people, pledging more than 2,000 hours to lead or volunteer at local events in their communities, joining forces with teachers and Code.org to help students learn coding and computer science skills. This follows Accenture's recently announced pledge of US$10 million to support initiatives

to expand STEM and computer science education through Internet Association, a group that represents global internet companies on matters of public policy. "Technology is creating jobs that didn't even exist five years ago and learning to code can transform the trajectory of a student's life and career," said Paul Daugherty, Accenture's chief technology

& innovation officer and 'chief coder.' "As part of our commitment to working with Code.org to prepare young people for the digital economy, Accenture employees last year dedicated more than 10,000 hours to Hour of Code, inspiring more than 100,000 students around the world to learn basic coding skills. We've seen the impact that Code.org is having on students and this year we're doing more to support that — more hours and more classroom sessions to spark an interest in working with the technologies of tomorrow." Hour of Code was launched in 2013 by Code.org, a non-profit dedicated to expanding access to computer science and increasing participation by women and underrepresented minorities. The program reaches millions of students through a one-hour introduction to coding and computer science. For the third straight year, Accenture is teaming with Code.org on Hour of Code and other STEM-related educational initiatives. New this year, Accenture Technology harnessed its internal expertise to create a coding tutorial that gives students a better understanding of artificial intelligence (AI). Students will discover how various AI techniques can

teach a robot to explore a new planet — including recognizing animals and plants, understanding a new language, and conversing with inhabitants. "The Hour of Code campaign has already led to more than 450 million hours of code being completed— it's mind-boggling. To date at least one out of every 10 students worldwide has participated in the Hour of Code program," said Hadi Partovi, co-founder and CEO of Code.org. "This year, we are asking for people to not only do an hour of code, but go beyond one hour and think about what they can do to ensure that computer science education continues for years to come." Melissa Daniel, a teacher Stone Mountain Elementary in Highlands Ranch, Colorado, whose class participated in Hour of Code last year, said, "Accenture led an Hour of Code event in my classroom that centered on an easy and fun coding tutorial. My students were excited to learn a new skill that can lay the foundation for a successful career. While getting access to computer science educational tools can be challenging, having access to Accenture's resources is enabling me to help my students become leaders in technology, setting them on the path to

eventually working with technology that could someday change the world." As part of this year's Hour of Code collaboration, Accenture executives will lead Hour of Code activities around the world. Among the executives participating are:

- Yves Bernaert, a senior managing director with Accenture Technology, will host students at Station F, a start-up incubator in Paris.
- Jo Deblaere, Accenture's chief operating officer, will host students for an Hour of Code event at the Accenture office in Amsterdam.
- Ambe Tierro, a senior managing director in the Philippines, will host students at the Accenture Liquid Studio in Manila.
- Mohan Sekhar, a senior managing director in the Accenture Technology Centers in India, will host students at an Accenture office in Bangalore.
- Christy Sovereign, Minneapolis office senior managing director, will be participating in a special Hour of Code event working with Robbinsdale Cooper High School student athletes to learn about the future of technology and sports, including a special session on how to build and fly a drone.
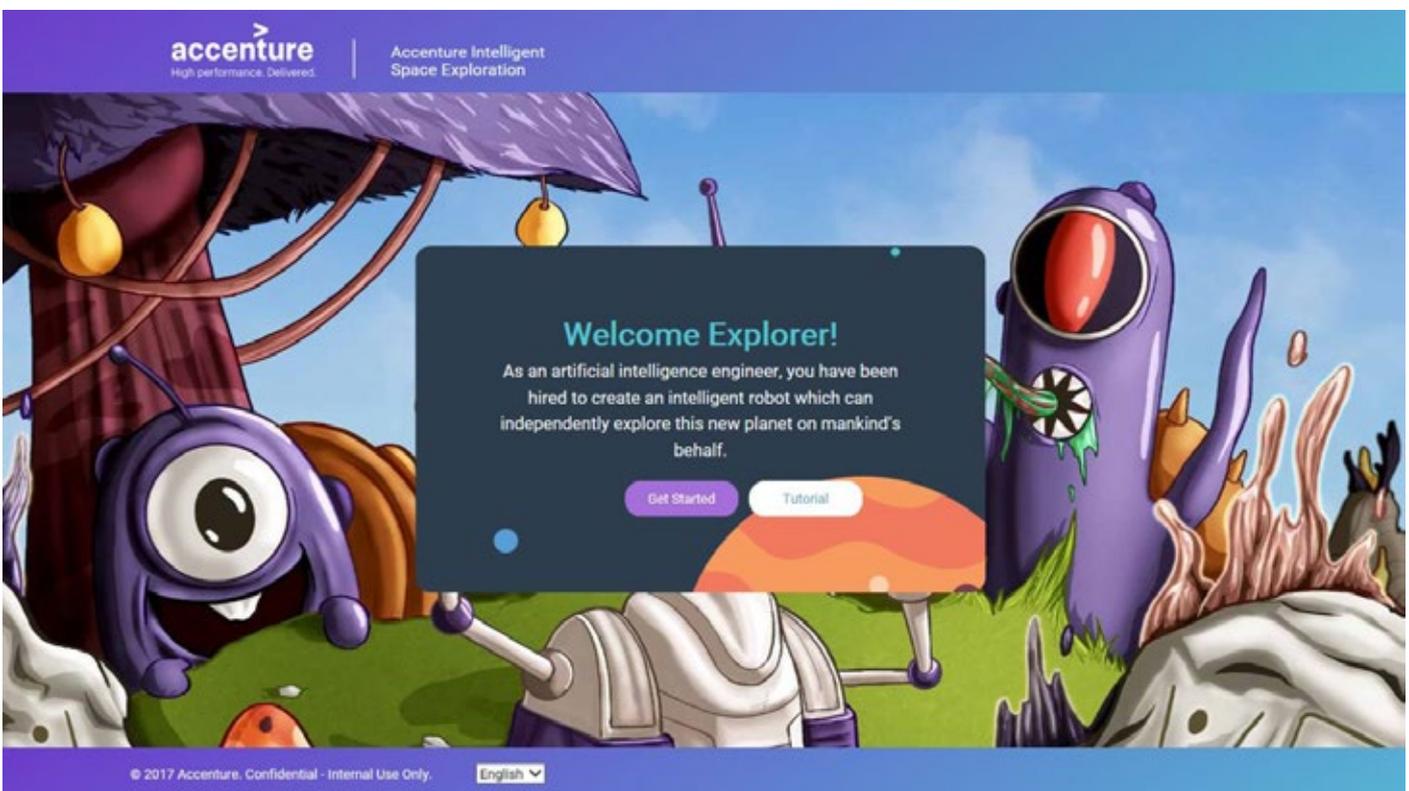
Alfa Gets ISO 39001 Certification Awarded in Road Traffic Safety Management

In cooperation with the General Secretariat of the National Council for Traffic Safety, Alfa, managed by Orascom TMT, organized a ceremony on the occasion of The World Day of Remembrance for Road Traffic Victims under the slogan Let us remember so that it never happens again. During the ceremony, it was announced that Alfa is the first telecom operator in the MENA region to obtain the ISO 39001 certification in Road Traffic Safety Management. Moreover, the Network of Employers for Traffic Safety (NETS) was launched. Governmental and non-governmental bodies, official departments and representatives of the public and private sectors all actively participated in the event, which was attended by Alfa CEO and Chairman Marwan Hayek; Beirut Police Chief General Mohammed Ayoubi representing Director General of the Internal Security Forces Brigadier General Imad Othman; the Director General of the Traffic and Vehicles Management Authority Hoda Salloum; the Secretary of the National Council for Traffic Safety Prof. Ramzi Salameh; the President of the Educational Center for Research and Development Dr. Nada Aouijan; as well as a number of officials and media representatives. Following the Lebanese national anthem, actress Carla Boutros, who lost her husband in a car crash, gave a speech on behalf of the families of traffic accident victims. She called for safer roads, urging the Lebanese to abide by safety standards, and companies to follow Alfa's initiative to reduce road fatalities.

Salameh

"Despite the fact that Lebanon loses hundreds of people of different ages in traffic accidents each year, this issue has unfortunately not yet become an urgent concern for large segments of society, even though it drains human and material resources and leads to many social and emotional problems", said Prof. Salameh in his speech. In recent times, however, "we have seen a growing interest in reducing the number of traffic accidents, such as the efforts of Alfa, which has obtained an ISO certification in Road Traffic Safety management, thanks to its pioneering efforts led by its CEO and Chairman, Marwan Hayek, and the cooperation of its managers and staff", Salame said.

Aouijan

Dr. Aouijan called for concerted efforts and cooperation among the concerned institutions to achieve the desired goal of reducing traffic accidents and casualties. She pointed out that the Educational Center for Research and Development provides educational services to all learners and their families as well as to the educational sector staff through an education package on traffic safety, including the development of a specific curriculum in accordance with the new traffic law and with modern educational-learning methods. "This is addition to educational tools such as a traffic sign poster, which we have redesigned and are relaunching today. 15 thousand copies of the poster will be distributed in public

and private schools, in cooperation with the Directorate General of Education and the Union of Private Schools. We will also launch a series of educational films about the various situations the learner may encounter on the roads and other films that can be produced in partnership with the National Council for Traffic Safety. Aimed at learners aged 14 to 18 years, a new smartphone app will include the new traffic law and several interactive awareness guidelines, documents and games. We hope to launch it before the end of the current school year".

Meghames

"We are committed to working with the Ministry of Telecommunications and Alfa to promote a culture of safety," said Chadi Meghames, Libanpost Finance and Administration Director, representing Libanpost's Chairman and Managing Director Khalil Daoud. He stressed the importance of companies covering occupational injuries that may affect workers and employees traveling to and from their workplace. He indicated, "Libanpost has been working for two years in cooperation with the National Council for Traffic Safety in Lebanon to develop a binding protocol for vehicle fleets based on full compliance with road safety, and we are close to finalizing it".

He then announced the launching of the Network of Employers for Traffic Safety (NETS) in the name of Libanpost and with the strategic partnership of Alfa and in close cooperation with its Chairman and CEO Marwan Hayek. "This will allow us to gradually transform into a model company from a traffic safety perspective that implements clear and secure transport policies", he concluded.

Ayoubi

Gen. Ayoubi emphasized that "the Internal Security Forces (ISF) are making every effort in the matter of traffic and prevention of accidents by enforcing the law and controlling traffic violations. This is in parallel to regulating traffic and addressing its effects in most roads, which drains our abilities and resources. I will not recall here the responsibilities of the concerned ministries, departments and institutions regarding the conditions and safety of roads. I will not propose solutions despite the fact that many exist, but I will say that the best way to reduce congestion and its effects remains the development, organization and planning of public transportation covering all Lebanese regions". "The ISF will spare no effort to ensure the safety of people on the road and to preserve their lives from the dangers resulting from the non-compliance with the carefully drafted traffic law, which may lead to terrible consequences such as disability and death", he assured. In a comparison between the two years preceding the traffic law and the two years after its implementation, Ayoubi pointed out that the number of accidents decreased by 22.5 percent, the number of deaths by 22.1 percent, and the number of injuries by 21.6 percent. He expressed the hope that all competent bodies will come together to achieve a comprehensive and integrated national strategy to build a system that protects the Lebanese and takes into consideration the objectives of the Road Safety Collaboration issued by the United Nations in 2011 to continue to achieve positive results.

Hayek

In his speech, Hayek pointed out to the fact that "the views of companies and people differ regarding the concept of social responsibility (CSR)". "Some people think it consists of donations or gifts, others see it as a suitable advertising and marketing means when recession hits, and some may take advantage of it to accumulate profits and encourage risky behavior. At Alfa, however, we consider that CSR reflects sustainability, results and figures, achievements and an effective and direct contribution where possible. We have committed ourselves to always and consistently do what we say, which we have demonstrated in our ongoing journey of sustainability and social responsibility that we launched 11 years ago. We were one of the first companies to commit to the United Nations Road Safety Goals, namely the third goal, which clearly states the need to cut road traffic deaths and injuries". He added: "Obtaining the ISO 39001 certification in Road Traffic Safety Management means that we have pledged to transform the company's buildings and surroundings into pedestrian friendly buildings that provide safe entry and exit, and reduce the Lebanese road risks. It also means that we have trained the entire Alfa staff on the principles of safe driving so they can become a role model in the community and in their families. Moreover, we have developed all the company's internal policies to reflect our commitment". This means, he added, "that Alfa will not buy any vehicles that are not equipped with airbags or Electronic Control Systems (ESC), helping both Alfa drivers and Alfa's car fleet become safer. To receive the ISO 39001 certification in Road Traffic Safety Management means that the Alfa administration will not organize campaigns that are untargeted, incomprehensible or uncoordinated with those concerned with traffic safety in the Lebanese state. We will also set with the National Council for Traffic Safety the standards and mechanisms for future campaigns". Hayek announced: "We have received this ISO certification after a long history of awareness campaigns on traffic safety and the dangers of mobile phone use while driving, and we promise to continue our role at the level of the company and the community. We stand with you today not only to console you, but to announce that we have turned the company with all its material and human resources to the first model in the Middle East, which is a real killer with its most dangerous roads in the world". He assured: "We did not come to celebrate our ISO certification which we earned with pride, but to offer it as a token of apology to the families of road accident victims on behalf of the Lebanese society for its carelessness and neglect. This token will not bring back your loved ones, but it will contribute to protect the rest of us". He added: "The United Nations considers that the adoption by all companies of ISO 39001 standards would reduce the number of road accident victims by almost half. So what are we waiting for? Today, under the patronage of the National Council for Traffic Safety, we launch in cooperation with Libanpost the Network of Employers for Traffic Safety (NETS), and invite all companies to join us to protect our employees, our fleets, and our buildings". He concluded: "Our ambition is to reach zero wounded and zero dead at the national level, and our hope is like our slogan we remember so that it never happens again".

Documentary

A film was shown about Alfa's journey in road safety up to its receiving the ISO certification, which was handed to Hayek by Qualitas General Manager Hassan Hamwi, who has congratulated Alfa on this achievement. He pointed out that Alfa is one of the first companies in the Middle East to adopt the principles of this international standard in the field of traffic safety, commending its commitment to the standards of traffic safety, in the hope that all companies and public institutions follow suit. At the end of the event, the Alfa building in Chevrolet was lit with the slogan of the commemoration, which was also distributed to passersby in cooperation with the Internal Security Forces.

New Peak Values at the World's Largest Internet Exchange

For the second time in 2017, DE-CIX, the world's leading Internet Exchange Operator, has set a new record. The throughput data peaked at over 6 Terabits per second on Wednesday evening. At the global level, this is a new peak value and thus a new world record within just a few months. Already in September 2017, a new record value of 5.88 Terabits per second was measured at DE-CIX in Frankfurt.

This took place in autumn parallel to the release of the new Apple iOS11 operating system. In general, our traffic is characterized by wave movements and reflects the rhythm of Internet use, starting at 6 a.m. in the morning and reaching its peak at around 9 p.m. We can also register seasonal changes – in the summer we are less online than in the autumn/ winter months. This value

marks another milestone for DE-CIX," says Harald A. Summa, Chief Executive Officer at DE-CIX. DE-CIX in Frankfurt is the Internet Exchange with the world's highest throughput data at peak times. However, the DE-CIX in Frankfurt is far from reaching its limits: the technical infrastructure of the Internet Exchange Point in Frankfurt has a total capacity of 48 Terabits.

Cisco Upgrades Zain Group's IP/MPLS Network

Zain Group has announced that it has selected Cisco's advanced segment routing platforms and WAN automation to bring the benefits of distributed intelligence and centralized control to its IP/MPLS network. Henri Kassab, Managing Director of International, Wholesale and Roaming at Zain Group, said: 'The demands of the digital era mean that we must prioritize improving speed and efficiency, defining a growth strategy based on new services, and ensuring security … These are the building blocks of our innovation that support our transformation in becoming an integrated digital lifestyle operator. With the support of Cisco's leading technology, our future-ready network architecture positions us well to drive tangible business outcomes and meet the evolving demands of our customers.'

Cisco Announces US$1 Billion Program for Smart Cities

So-called "smart cities" have less pollution, safer streets, and better quality of life for citizens. But many finance officers struggle to fund the upgrades that will make their cities smart. To help, Cisco introduced the City Infrastructure Financing Acceleration Program. It is a US$1 billion program aimed to make it easier, faster, and more affordable for cities around the world to fund and adopt technologies that will transform their communities. The funding will be provided through Cisco Capital® in partnership with private equity firm Digital Alpha Advisors and pension fund investors APG Asset Management (APG) and Whitehelm Capital. "Funding is a major stumbling block for municipalities beginning their smart city transformation," said Anil Menon, Global

President of Cisco's Smart+Connected Communities. "With our partners, Cisco will bring the capital and expertise it takes to make smart city projects a reality. Digital Alpha, APG, and Whitehelm Capital bring a fresh perspective on investment in an area that has previously been perceived as too new and, therefore, too difficult to finance." The program helps cities assemble the right type or suite of finance instruments to fund and deploy innovative technology with minimal initial investment. Whether a city is looking to reduce energy usage, ease traffic and parking, or boost public transportation ridership and revenues, the program will help cities with solutions. Revenue-share financing, for instance, even allows a city to tie financing to desired outcomes and extend future operating budgets

through revenue streams from the new services that a digitized infrastructure makes possible. Additionally, at the recent Smart City Expo World Congress, Cisco announced added functionality to its newly renamed connected digital platform, Cisco® Kinetic for Cities, which integrated with the Cisco Kinetic IoT data platform. The new features provide enhanced support for public safety. From the new full-policy automation options to an improved dashboard with integrated video, updates to the platform put citizen safety first. Real-time notification of emergency information now draws on additional IoT data sources and Cisco Spark™ Collaboration, enabling faster emergency response. For more information about the latest additions to Cisco Kinetic for Cities, go to Anil Menon's

blog here. Cisco has also announced new purchasing options for Cisco Kinetic for Cities, including prepackaged starter solutions, which combine the Cisco IoT data platform, solution, and services with those from our ecosystem partners into ready-to-roll-out, end-to-end solution suites. Cisco has added a number of new

Cisco Kinetic for Cities customers. The Town of Cary, North Carolina, for instance, has created a "Living Lab" providing smart city technologies to improve the lives of citizens. Using the Cisco Kinetic for Cities platform, town officials can actively monitor the number of available parking spots—particularly spots for the handicapped—to gauge use and help with planning. "The Cisco Kinetic for Cities platform provides us the tools we need to positively affect our citizens' lives," said Terry Yates, Infrastructure and Network Manager, Town of Cary, North Carolina. For additional information about Cary's Cisco Kinetic Smart City efforts, reference this blog: Town of Cary, NC: Using Insights for Parking Improvements.

Eutelsat's All-Electric EUTELSAT 172B Satellite Set to Transform Connectivity Landscape in Asia-Pacific

Eutelsat Communications' (Euronext Paris: ETL) all-electric EUTELSAT 172B satellite that went into full commercial service is now offering greatly enhanced flexibility, power and connectivity for users in a vast region stretching from the West coast of the Americas to Asia, Oceania and across the Pacific. The transfer of services to EUTELSAT 172B from EUTELSAT 172A was completed seamlessly in a series of overnight maneuvers, releasing EUTELSAT 172A for an alternative orbital position to serve customers in the Asia-Pacific region. Launched in June this year, EUTELSAT 172B sets a new benchmark as the fastest satellite to reach geostationary orbit using electric propulsion (in only four months) and the first optimized for in-flight connectivity across the Pacific. Its innovative High Throughput payload, consisting of 11 spot beams, will transform efficiency by enabling power to be dynamically allocated as aircraft fly high traffic routes in the Asia Pacific region. This step change will allow Panasonic, the major client of the HTS payload, to better meet passenger demand and cost-effectively ensure consistently high levels of service to

airlines. In addition to the HTS payload, EUTELSAT 172B significantly increases regular bandwidth at the 172° East position, with C-band capacity as well as flexible Ku-band capacity spread across five interconnecting Widebeam service areas. Beyond maritime, video, enterprise, cellular backhaul and government services, the Ku-band capacity will

serve as an overlay to economically deliver live television to passengers in flight. Rodolphe Belmer, Eutelsat CEO, said: "As EUTELSAT 172B begins

commercial activity that will stretch into the 2030s, this is a key moment to thank the men and women at Eutelsat and our colleagues at Airbus for collaborating passionately on a program that sets a new industry standard. In addition to taking our 172° East location to a new level of performance for clients in the Asia-Pacific, EUTELSAT 172B further validates the value of electric propulsion for high-capacity satellites that are core to providing cost-competitive services in the telecoms marketplace."

Eutelsat Satellite Connectivity Selected by Colombian Government

The Colombian Ministry of Defense has signed an agreement with Eutelsat Communications for capacity on the EUTELSAT 115 West B satellite. The multi-transponder contract, the first between Eutelsat and the Colombian Ministry of Defense, follows the signature of a government to government agreement between France and Colombia, designed to encourage cooperation in the context of the France-Colombia Year. The Colombian government will leverage EUTELSAT 115 West B's exceptional power levels over the Andean Region to host Ministry of Defense networks across the country, used by the General Command of the Colombian Military Forces, the Army and the Air Force.

General José Javier Pérez Mejía, Deputy Minister of Defense of Colombia, said: "In the interests of improved organization of the satellite communications networks operated by our defense forces the Colombian Ministry of Defense decided to seek a single contractor to meet its diverse needs. Of the countries we invited to contend, France, through Eutelsat, presented the best economic and technical proposal, leading us to select EUTELSAT 115 West B." Michel Azibert, Chief Commercial and Development Officer at Eutelsat, added: "This first agreement with the Colombian Ministry of Defense reinforces our commitment to working hand in hand with governments across the globe to deliver efficient

solutions matching connectivity and security needs. We're delighted to enter into this new relationship in the context of the 2017 France-Colombia Year, and to strengthen relations between both countries."

Huawei Partners with Xpress Money to Drive Mobile Money Services

Money transfer service, Xpress Money, has partnered with Huawei to drive mobile money services to more of the global unbanked, targeting Africa in particular. The partnership will give the remittance firm access to Huawei's mobile money service platform, which has over 100 million mobile money accounts globally. Huawei's mobile money services platform

delivers basic banking transactions in developing countries. The technology is not restricted, and because it works on both smartphones and basic handsets, it has been particularly successful in developing markets, it said. Recipients of Xpress Money remittances can use the service to make online and offline payments, pay for essential services such

as utilities and school fees, as well as financial services like loan applications, insurance and banking. "At Huawei, we want to bring the best remittance services to our network partners and their customers. Africa is a key market in the mobile money industry and it's imperative we give our customers here access to the best services," said David Chen, director of marketing & solution sales Huawei Southern Africa Region. "For those that have limited access to formal banking services, mobile money is a critical technology. There are over 500 million mobile money accounts currently in use, and with Huawei servicing over 100 million of these, we're confident this collaboration will improve the state of financial services for Africa's unbanked," said Sudhesh Giriyan, chief operating officer of Xpress Money. Xpress Money' has a global presence in more than 165 countries across 200,000 agent locations providing simple, fast and secure money transfer solutions to thousands of customers, every day. Huawei's mobile money partners in Africa include Safaricom, Vodafone, Vodacom and Teasy Mobile in 10 African countries including Kenya, Ghana, Nigeria and Zimbabwe.

Huawei Releases Position Paper on 5G Spectrum, Appealing for Global Harmonization

At the 8th Global Mobile Broadband (MBB) Forum held on Nov 15th in London, Huawei releases a Position Paper on 5G Spectrum, which presents Huawei's insights and recommendations on 5G spectrum policy. This paper aims to call upon the industry's organizations and regulators to facilitate spectrum harmonization and ensure timely availability for early deployment and large-scale commercial use of 5G. 5G is the next generation of MBB technology, capable of ultra-fast speeds, low latency, and excellent reliability. The 5G New Radio (5G-NR) interface can provide superior MBB services for end users anytime and anywhere, while releasing the Internet of Things (IoT). This will enable a diverse range of innovative use cases, such as smart manufacturing, connected cars, smart logistics, and wireless home broadband. 5G is poised to create a super connected world. 5G assumes the responsibility of promoting digital transformation throughout society and requires a wide range of spectrum resources. Huawei proposed a multi-layer spectrum approach in consideration of divergent requirements of 5G services and different characteristics of related frequency bands. The "Coverage and Capacity Layer" relies on the 2 to 6 GHz range (e.g. the C-band, 3.3-4.2 and 4.4-5.0 GHz) to deliver the best compromise between capacity and coverage. This layer will emerge as the world's first band for the much anticipated commercial deployment of 5G. The "Coverage Layer"

exploits the spectrum below 2 GHz (e.g. 700 MHz) providing wide-area and deep indoor coverage. The "Super Data Layer" relies on the spectrum above 6 GHz (e.g. 24.25-29.5 and 37-43.5 GHz) to address specific use cases requiring extremely large capacity and high data rates. The availability of spectrum resources in the 5G era needs administrations' planning and allocation of contiguous spectrum. The C-band is the key primary frequency band for the introduction of 5G by 2020. Each operator will need at least 100 MHz contiguous channel bandwidth to support Massive MIMO to boost peak, average, and cell-edge throughput with affordable complexity. The 5G-NR system on the 3.3-3.8 GHz band is expected to be commercially ready by 2018. As the first step of 5G deployment, it is highly recommended that 3.3-3.8 GHz or a portion of it be allocated as soon as practicable. High frequencies (above 6 GHz) will also play an important role for 5G. Huawei suggests that at least 800 MHz of contiguous spectrum can be allocated to each operator at the initial stages to meet 5G requirements for ultra-high capacity of wireless home broadband (WTTx) and for high mobility especially in hotspot areas. 5G-NR will embrace many new features and technical innovations including LTE/NR uplink spectrum sharing, Massive MIMO, network synchronization (inter-operator), duplex flexibility, and others. These innovative features and technologies provide an opportunity for regulators

to adjust regulations for more efficient and flexible spectrum utilization. LTE/NR uplink spectrum sharing lifts the restriction on a single band for both uplink and downlink. For example, the 5G-NR uplink at 3.5 GHz can exploit spectrum resources at 1.8 GHz that have been used for LTE. This scheme allows improved network coverage and spectral efficiency. Regulatory frameworks need to embrace the principle of technology and service neutrality for the most efficient spectrum allocation and sharing. Regulatory masks should be revised to support the proliferation of Massive MIMO antenna systems. The incentives for network synchronization in 5G networks are necessary for efficient deployment of 5G-NR networks in unpaired assignments. Meanwhile, provisions to support duplex flexibility should also be considered as the next step to allow for a more flexible use of the spectrum resources. More than improving performance from previous generations of mobile technologies, one of the core targets of 5G is to provide wireless connectivity to vertical industries. The success of 5G will therefore depend on positive collaboration between the telecom industry and a broad range of potential industrial users of 5G networks, reaching beyond the telecom sector. A globally harmonized spectrum enables economies of scale, facilitating cross-border coordination and roaming for end users. Consistent spectrum timelines and harmonization measures are key enablers for the success of 5G.

5G Testing Spurs Huawei to Deliver 5G by 2020

Huawei and its partner NTT Docomo have reported a breakthrough success in their joint 5G testing trials, achieving high speed data transmission over a distance of 1.2km on the 28GHz millimeter wave spectrum. "The high-speed and long distance support is one of important technical challenges for 5G mmWave conditions. This successful long distance live-demo on a 5G mmWave is a groundbreaking achievement in our joint effort with NTT DOCOMO to build a

fundamental 5G commercial environment. This success makes us more confident in realizing the goal of commercializing 5G by 2020," said Gan Bin, Vice President of Huawei's 5G product line. The trial took place in downtown Tokyo, where a base station working over 28GHz was located at Tokyo Skytree's viewing deck, 340m above the city. The partners achieved more than a 4.52Gbps downlink throughput and a 1.55Gbps uplink throughput with a coverage range of 1.2km. Huawei

utilized its 5G base station for the test, which supports Massive MIMO and beamforming technologies. Huawei also provided the 5G core network and the 5G mm wave test user equipment. Huawei anticipates conducting further testing at the world's biggest 5G testing site in Beijing's Huairou District. The test comes amid a flurry of 5G testing around the world, with BT and Nokia announcing plans for live 5G tests in the UK earlier this month.

Huawei Signs AI Mobile Agreement with Baidu

Huawei and Baidu will work together on developing and building an open AI mobile ecosystem, including devices, technology, internet services, and content. Huawei has announced signing a strategic agreement to build an open mobile artificial intelligence (AI) ecosystem with Chinese search engine giant Baidu. The strategic cooperation agreement covers AI platforms, technology, internet services, and content ecosystems, Huawei said. The open ecosystem will be built using Huawei's HiAI platform and neural network processing unit (NPU); and Baidu's Paddle-Paddle deep-learning framework and Baidu Brain, which contains Baidu's AI services and assets. It will allow AI developers to make use of the technology. Under the partnership, Baidu and Huawei will also work on improved voice and image recognition on smart devices, and will built a consumer augmented reality (AR) software and hardware ecosystem. Content and internet

services being explored by the two companies will "strengthen cooperation in areas such as search and feed to bring consumers a wealth of quality content with a more intuitive and convenient service experience", Huawei added. "The future is all about smart devices that will actively serve us, not just respond to what we tell them to do," said Huawei Consumer Business Group CEO Richard Yu. "With a strong background in R&D, Huawei will work with Baidu to accelerate innovation in the industry, develop the next generation of smartphones, and provide global consumers with AI that knows you better." Baidu CEO Robin Li said the search giant is "dedicated" to exploring AI, having last week announced the availability of its AMD EPYC-powered AI, big data, and cloud computing (ABC) services. Also working on developing autonomous driving and autonomous vehicles, Baidu is hoping to utilize Huawei's large customer base for the

mobile AI project. "Interactive technologies including voice, machine vision, and AI will drive the [mobile phone] industry forward. Originally developed to be personal tools, mobile phones will become a natural extension of the human body and AI-powered assistants for consumers," Huawei added. "Huawei and Baidu will continue to priorities consumer needs and leverage each other's strengths to form a partnership that benefits everyone." Huawei head of Consumer Software Engineering and director of Intelligence Engineering Felix Zhang had last month said the addition of AI capabilities to smartphones will bring the next shift in technology, comparing AI to the advent of steam engines in terms of its capacity to fundamentally change people's lives. Mobile AI will change two key aspects of the smartphone, he said: User-machine interaction, and "context-personalized openness". The first aspect will improve efficiencies between the user and their phone across text, voice, image, video, and sensors, while the second will actively provide services and aggregated information across apps, content, third-party features, and native features, he explained. "If you look at the whole ecosystem, the AI will fundamentally change the phone from the smartphone to the intelligent phone," Zhang said. Huawei had unveiled its Kirin 970 chipset with built-in AI in September, at the time calling it the "future of smartphones". Its new mobile AI is made up of a combination of on-device AI and cloud AI. "Huawei is committed to developing smart devices into intelligent devices by building end-to-end capabilities that support coordinated development of chips, devices, and the cloud," Yu said at the time. "The ultimate goal is to provide a significantly better user experience. The Kirin 970 is the first in a series of new advances that will bring powerful AI features to our devices and take them beyond the competition." Limitations in cloud AI necessitated improvements across latency, stability, and privacy, Huawei said, with on-device AI providing this as well as adding sensor data to the offering. Its new flagship smartphones, the Mate 10 and Mate 10 Pro, come kitted out with the AI-focused Kirin processor, which has the dedicated NPU that is able to process 2,000 images per minute via image-recognition technology. Huawei additionally provided the Kirin 970 as an open platform for mobile AI developers and partners in order to drive further developments. This followed Huawei saying in August that AI would play a critical role in driving its smartphone innovation, with the tech giant predicting the advent of the "superphone" two years ago, saying it would be developed by 2020 and take advantage of advancements in AI, big data, and cloud computing.

Huawei Wireless X Labs and TPCAST Sign MoU to Develop 5G Cloud VR Rendering Solution

During the 8th Global Mobile Broadband Forum which was held in London this month, TPCAST and Huawei Wireless X Labs signed a memorandum of understanding to develop a 5G cloud VR rendering solution. TPCAST plans to offer an ultra-low latency codec and real-time VR data control protocol, while Huawei provides cutting-edge 5G network technologies. Also during

the event, Huawei and the University of Edinburgh signed a research cooperation to investigate the potential for AI robotics systems to operate over 5G wireless networks. VR and AR are transformative technologies poised to revolutionize the consumption of content and communications in the fields of video, gaming, and virtual social media. They can also be used for healthcare,

education, tourism, and design. According to market research from ABI and Wireless X Labs, the total VR and AR market value will increase from US$1 billion in 2016 to US$300 billion in 2025, with a compound annual growth rate (CAGR) of 70.9%. "TPCAST is excited to work with Wireless X Labs and develop the 5G cloud VR rendering solution," said Michael Liu, CEO of TPCAST. "TPCAST's

ultra-low latency codec and real-time VR data control protocol makes cloud rendering possible. We are dedicated to working with Huawei to optimize our cloud rendering technologies and improve the VR experience. It is our solemn and inescapable duty to improve the cloud VR rendering solution." Wang Yufeng, who heads Huawei Wireless X Labs, emphasized that, "Cloud VR is an important use case for 5G networks. The connections between VR terminals and the cloud are crucial to deliver an optimal VR user experience. 5G networks can provide low latency and large bandwidth required by cloud rendering and content release. Huawei will provide world leading 5G network technologies and test environments and is honored to partner with TPCAST to verify cloud VR, laying a solid foundation for future trials and commercial deployment on many operators' networks." Speaking about the research cooperation, Professor Charlie Jeffery, Senior Vice Principal, University of Edinburgh said: "We are thrilled to have deepened our relationship with Huawei to researching 5G within AI applications. Our ambition is to utilize the knowledge of our world-leading experts to fully understand the interaction of AI and robotics systems with mobile networks. This new research agreement gives our team the opportunity to apply their 5G networking expertise into solving real-world problems – helping to transform industries

including healthcare and emergency services." The project will build on the University of Edinburgh's existing research into AI and autonomous systems to provide new insights into how these systems will use AI to collaborate with mobile broadband networks. This can enhance the performance of both networks and applications to enable greater levels of interaction between people and systems. Areas of initial focus include healthcare robotics and mobile video. The Global Mobile Broadband Forum was held in London on November 15-16, 2017.

Huawei Wireless x Labs Announces Digital Sky Initiative to Enable the Low Airspace Digitized Economy

The 8th Global Mobile Broadband Forum, which kicked off in London last week, gathered over 1,400 leaders from mobile telecom operators, vertical industries, standards organizations, and industrial alliances around the world. During the event, Huawei Wireless X Labs announced the "Digital Sky Initiative" that aims to spur the development of drone applications and enable the low airspace digitized economy via enhanced low airspace network coverage. Also during the event, Ken Hu, the Deputy Chairman and Rotating CEO at Huawei, outlined a world where all things are connected, presenting telecom operators with nearly limitless growth potential. Today, there are 20 million shipping containers in the world, and 300 million LED streetlamps. There will be 1.8 billion water meters by 2025, and every year, 100 million new bicycles roll off the factory floor. "Each of these is a potential new subscriber," said Hu. "But to support a future where all things are connected, telecom operators need to strengthen network performance and management. Future networks need to be application-centric, data-driven – and eventually, intelligent." "We have to believe that everything can be connected and will be connected," he continued. "These opportunities are real. But to seize them, we need a new model." Hu calls this new model the "scale-out and scale-up approach." First, he recommends that telcos scale out to provide more connections. This will generate revenue, and pave the way for scaling up. Next, they can work with partners to develop value-added services based on the specific needs of industrial applications. Speaking about the "Digital Sky Initiative", Zhou Yuefeng CMO of Huawei's Wireless Network Product Line said, "More and more activities that traditionally take place on the ground are now happening in the air. Flying taxis for personal transportation will soon be a reality. The combination of drones and cellular networks will redefine the airspace, transforming the way we travel, shop, and create. However, all current base stations are designed to serve humans and objects on the ground. Low airspace drones are

supported by reflected signals and side lobe coverage. As a result, drones presently face severe signal interference challenges. The current network can only support a limited number of drone applications where aircraft fly below 120 m." The digital sky initiative aims to provide 300 m low airspace network coverage, and create an advanced test environment for drone applications. The initiative will also support non-line-of-sight (NLOS) flight control verification and large volume data transmission to enable the low airspace digitized economy. Meanwhile, Huawei predicts that there will be 100 billion connections around the world by 2025. Beyond intelligence, Huawei's Rotating CEO, Ken Hu touched on the need to boost network performance. "To support a massive number of connections between things, our networks need much greater capacity and lower, more reliable latency. Most importantly, behind the scenes they need intelligent systems driving performance. Networks are more complicated than ever before, with greater demand for agility. Traditional approaches to network management won't be able to keep up." Hu continued, "All industries are now adopting digital technology and artificial intelligence. Not just manufacturing and agriculture, but also service industries like livestock management, logistics, and public safety. The mobile industry is no exception. Mobile is the enabler of this process – the foundation of digital transformation. We have to go smart first to help other industries do the same." Beyond technology, Hu pointed out that the industry needs to close gaps to strengthen the mobile ecosystem. "In the past, we focused on connecting people. That was like planting a single tree. Now we're connecting things. That's like planting an entire forest. We have to integrate with the ecosystem, and build it out together." At the event, Huawei showcased its latest 5G technology, as well as the results of joint research spearheaded by its Wireless X Labs platform in domains like connected vehicles, connected robots, IoT, virtual reality, and augmented reality.

NOKIA

Nuage Networks to Support the Fujitsu Cloud Service K5's Global Expansion

Nokia's software-defined network (SDN) venture, Nuage Networks, has been chosen by Fujitsu to expand its Cloud Service Fujitsu Enterprise Cloud Service K5. The world's largest OpenStack cloud service, K5 provides Infrastructure as a Service (IaaS) using both virtual machine (VM) and bare metal services, with the latter managed by OpenStack Ironic, in a global commercial first. The powerful combination of OpenStack and the Nuage Networks Virtualized Services Platform (VSP) provides Fujitsu and its enterprise customers with massively scalable and highly available virtual networks. The Nuage Networks next-generation overlay SDN solution will help Fujitsu expand its deployment of its K5 cloud-based services beyond its current data centers in Japan, Europe and North America, to new centers in Singapore and Australia. Starting with the data center in Japan, Cloud Service K5 will enable Fujitsu's enterprise customers to accelerate their digital transformation by moving their

existing server infrastructure into K5 data centers. This allows them to quickly migrate to a cloud-native architecture running on OpenStack Ironic and the Nuage Networks VSP. In addition to 'on-demand' delivery of services, it will assure them greater security, manageability and availability of the cloud, as well as full support for non-cloud-native applications running on fully integrated bare metal services. The Nuage Networks VSP supports clouds of all sizes and architectures. Along with OpenStack, the Nuage Networks VSP supports all cloud management systems, hypervisors and workload types. Providing greater automation and efficiency across hybrid cloud and heterogeneous datacenter environments, the Nuage Networks VSP provides multi-tenant policy-based software-defined networking for Layer 2, 3 and 4 services from branch to the DC, with enhanced security, microsegmentation and real-time flow visibility with dynamic threat detection and response, including

service chaining. Masahiro Ohta, Head of the Digital Business Platform Unit, Fujitsu Limited, said: "The Nuage Networks VSP is ideal for its ability to integrate directly with OpenStack and provide our customers with a highly customizable and flexible IaaS platform for supporting a wide variety of cloud management systems and applications." Sunil Khandekar, CEO, Nuage Networks, said: "The Fujitsu K5 IaaS service is unique for its early support of the emerging OpenStack Ironic project, which provides support for bare metal services. Our Nuage Networks team worked closely with Fujitsu to develop this first-of-its-kind implementation into production, showcasing Fujitsu's leadership in the Japanese and worldwide market. This is in keeping with our commitment to enable the seamless consumption of resources and services hosted within public clouds."

Nokia Leading Effort to Push for Spectrum above 95 GHz

Nokia is joining together with other technology leaders, including Virginia Diodes and Keysight Technologies, in becoming founding members of the mmWave Coalition, which will advocate for the use of radio frequencies above 95 GHz at the FCC, other U.S. government agencies and the ITU. "The mmWave Coalition member companies are united in the objective of removing regulatory barriers to technologies and using frequencies ranging from 95 GHz to 450 GHz," wrote Nokia's Paul Norkus in a blog post. "While 5G and possibly even 6G might look at these as potential frequency bands to use, the Coalition is not limiting itself to supporting any particular use or technology," Norkus said. "Instead, it is working to create a regulatory structure for these frequencies that would encompass all technologies and all possible uses, limited only by the constraints of physics, innovation and the imagination." The coalition has an ally at the head of the FCC, so that should make its job a little easier. During a speech at Carnegie Mellon University in March, FCC Chairman Ajit Pai noted that frequencies

above 95 GHz haven't traditionally been used for mobile wireless technologies. "But I believe that, instead of having regulators decide which frequencies are useful, we should put spectrum out there as a testbed and leave it to the innovators to figure out how to use it," Pai said at the time. "Applications for experimentation above the 95 GHz band could qualify for Section 7 treatment. And this determination, in turn, could accelerate the deployment of cutting-edge wireless services and other innovations." There are others advocating for this spectrum to get unleashed. In January of this year, industry consultant Michael Marcus, head of Marcus Spectrum Solutions and retired associate chief of the FCC Office of Engineering and Technology, gave a presentation (PDF) to FCC staffers about the importance of opening 95-475 GHz to commercial use and the technical and policy challenges. The presentation noted that NTT used a 125 GHz system at the 2008 Beijing Olympics and that the mission of ETSI ISG mWT is to promote the use of millimeter wave spectrum from 50 GHz up to 300 GHz for present and

future critical transmission applications and use cases. Possible uses of spectrum at 95-450 GHz include point-to-point terrestrial communications. Meanwhile, in comments (PDF) to the FCC related to spectrum bands above 24 GHz, Brown University School of Engineering Professor Daniel Mittleman said that for over 20 years, his area of specialization has been the science and technology of submillimeter and terahertz waves and their uses in spectroscopy, imaging and sensing. He and his colleagues feel strongly that this region of the spectrum is poised to have an enormous economic impact—a feeling that's based on the rapid pace of technological progress in the field, as well as the "astounding acceleration in recent interest on the part of many companies, both in the U.S. and abroad." One solution that's gaining favor among researchers, as well as groups such as the IEEE 802.15 WPAN Terahertz Interest Group (IGTHz), is the idea of developing new network capabilities, not to replace, but to supplement the existing cellular architecture, according to Mittleman.

Nokia Transforms Experience for MTN Group's 52 Million Nigerian Customers

Nokia has been selected to help MTN Nigeria drive its transformation from network- to customer-centric operations and improve the experience for its 52 million customers. Nokia's Customer Experience Management (CEM) solutions deliver automation and intelligence to help service providers operate more efficiently and seize new business opportunities, while ensuring subscribers receive the maximum benefit from their services. MTN Nigeria is the first service provider in the region to deploy Nokia Cognitive Analytics for Customer Insight (formerly CEM on Demand) with Nokia Service Quality Manager (SQM) software. Powered by machine learning algorithms, Nokia Cognitive Analytics for Customer

Insight software provides a complete view of customer satisfaction, revenue, and device and network performance. When combined with Nokia SQM, which provides a holistic picture of service behavior and performance, MTN Nigeria will be able to speed the identification of service issues, like poor voice call and data session quality, and prioritize improvements based on customer and business impact. The service provider will also leverage the global expertise of Nokia Analytics Office Services to facilitate its transformation to a customer-centric business. It will enable MTN Nigeria to maximize the benefits of Nokia software, accelerate the transformation process and adopt new advanced capabilities, such as data

science and automation. By deploying the Nokia solution with several use cases including VIP monitoring, roaming insights, churn diagnostics, Net Promoter Score (NPS) improvement, and others, MTN Nigeria aims to deliver a higher level of service quality and improved customer satisfaction, while increasing its NPS and reducing churn. Naveed Kashif, Nokia's Account Leader for MTN Group, said: "MTN recognizes the growing importance of customer experience management as it seeks to differentiate itself and provide the best possible services to subscribers. Nokia provides software technologies and world-class expertise to help service providers take full advantage of the latest advances in automation and intelligence, and we are delighted to help MTN in its journey to build a more agile, customer-centric business." Hassan ElChami, Chief Technology Officer at MTN Nigeria, said: "Nokia's CEM solution and its underlying methodology exceeded our expectations, and its extensive use case library demonstrated the company's proven track record in helping service providers around the world transition to customer-centric operations. We are confident that the partnership with Nokia will be invaluable in our ongoing effort to find new and more innovative ways to deliver superior experiences for our customers."

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Hassan Elchami
CTO, MTN Nigeria

PT Hutchison 3 Indonesia Chooses Nokia's Cloud-Native Packet Core to Deliver Enhanced Mobile Broadband and Future Services

PT Hutchison 3 Indonesia (H3I) has chosen the Nokia Cloud Packet Core solution to help meet rapid data growth in the Indonesian market. Nokia's solution enables H3I to provide a highly scalable platform to profitably deliver enhanced mobile broadband and move towards future innovative services. A leader in providing data services, especially to the all-important millennial market, H3I has chosen Nokia to evolve its mobile packet core to a cloud-based architecture. This move is part of H3I's digital transformation for superior customer experience and preparations to deliver future services. Part of Nokia's AirGile portfolio, the cloud-native design allows

H3I to lower costs and substantially accelerate time-to-market for innovative new services. Nokia's industry-leading and field-proven Cloud Packet Core solution includes its Cloud Mobility Manager and Cloud Mobile Gateway. Providing reliability, scalability, flexibility and performance, the Nokia Cloud Packet Core anchors multi-technology access across wireless licensed, shared, unlicensed spectrum and fixed network technologies, enabling H3I to support a greater variety of devices and deliver a broader range of services over multiple access technologies. Randeep Singh Sekhon, President Director, Hutchison 3 Indonesia, said: "We are satisfied

cooperating with Nokia on our roadmap to transform our network core to the state-of-the-art cloud-native architecture. It provides us the foundation to uplift customer experience and accelerate new innovative services." Robert Cattanach, head of Indonesia for Nokia, said: "This is an exciting step into the future both for us and our colleagues at H3I. The first cloud-native packet core implementation will play a key role in the transformation of H3I to an agile digital service provider, enabling it to capture the crucial youth market with compelling new services and offers, while lowering operational costs and increasing reliability, performance and security."

Nokia and China Unicom to Enhance Mobile Broadband Performance in China Using Small Cells

Nokia and China Unicom are to offer Nokia Flexi Zone small cells and an AirScale low power radio head for deployment in 31 provinces in China. This will give China Unicom's subsidiaries new flexibility as they densify busy city 3G and 4G LTE networks and further enhance performance in suburban and rural locations. By deploying the Nokia Flexi Zone portfolio, China Unicom will be able to densify the network where it isn't possible to add a macro base station because of space or cost constraints. Small cells can also be used to extend coverage and capacity inside offices and homes, as well as in high-traffic locations such as train stations and shopping malls. The ability to upgrade the small cell portfolio via software to deliver narrow-band IoT (NB-IoT) support means that the deployments will also lay the foundation for the future introduction of IoT and 5G services. Future implementation of NB-IoT will enable the connection of myriad sensors for the delivery of many smart city services, including smart transport and metering systems as well as the introduction of smart healthcare. Nokia will leverage its extensive global services expertise to optimize small cell deployments for China Unicom, including network planning and optimization, equipment commissioning and care in warrantee services. Gao Bo, head of Customer Business Team for China Unicom at Nokia Shanghai Bell, said: "This agreement extends the long-term cooperation between China Unicom and Nokia. We have developed a small cell portfolio that will allow operators to cost-efficiently densify and scale their networks, boosting 3G and 4G performance to stay ahead of demand. By combining this small cell technology with our extensive global services expertise, we can optimize any deployment for China Unicom."

About the Agreement:
- Four products will be made available for deployment in 31 provinces via the China Unicom procurement list:
- Nokia Flexi Zone Mini-Macro offers macro-sized coverage in a compact size, allowing operators to deploy where space is limited or costly
- Nokia AirScale Micro RRH offers outdoor coverage support for 3G and 4G networks in a single unit
- Nokia Flexi Zone Micro meets high-performance mobile broadband demands in busy public locations such as shopping malls and transport hubs
- Nokia Flexi Zone Pico can be used to extend coverage and capacity inside homes and offices
- The 31 provinces represent 20 percent of China Unicom's network and include Heilongjiang, Inner Mongolia, Hebei, Liaoning, Jiangsu, Anhui, Hunan, Sichuan, Shanghai, Guangxi, Xinjiang, Guizhou, Fujian, Gansu, Shaanxi and Jiangxi.

PCCW Global

PCCW Global Wins WCA Moving Pictures Award for World Class Live VR Service

PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, has won the Moving Pictures Award at the prestigious World Communication Awards 2017 in London, England. The Awards recognized our deployment of the world's first full end-to-end, real-time, multi-camera, 360°, 3D virtual reality (VR) live video service, a practical demonstration of capabilities designed to support global content streaming for event organizers, content owners and traditional broadcasters. In collaboration with content partners, PCCW Global successfully tested the service at the 2017 Cathay Pacific/HSBC Hong Kong Sevens rugby tournament held earlier this year, affording viewers a totally immersive 360° VR viewing experience. The tournament provided the perfect opportunity to showcase, field test and

prove the technological, commercial and public readiness for a live VR broadcast experience. The success of the project showcased PCCW Global's ability to deliver a live, real-time VR streaming experience to the 360° VR audience. It also demonstrated the company's ability to extend its traditional broadcast capabilities to include a live VR service to other events and broadcasters. The challenges of providing real-time live VR streaming compared to traditional TV revolve around the complexity of dealing with data rates which are significantly larger and more demanding on global connectivity and associated delivery networks. By way of comparison, published reports suggest that even basic VR video requires 17 times the bandwidth of normal HD video. Mr. Mike van den Bergh, Chief Marketing Officer of PCCW Global, said, "We are very pleased

that our commitment to innovation has been recognized by this award from such a prestigious industry association. The technology is very exciting and we are proud to be at the forefront of global VR broadcast innovation. However, it's important to note that this innovation is as much about providing a robust and reliable global connectivity infrastructure as it is about the exciting technology that we utilize to capture VR streams at such events. The success of VR broadcasting relies very much on the flexibility and resilience of global networks such as ours." Judges agreed that PCCW Global's VR solution is "genuinely innovative" and "highly exciting". "Finally a service that moves the needle, where VR and sports broadcasting are combined," one member of the judging panel said.

PCCW Global Connects Hong Kong and Thailand Air Navigation Service Providers

PCCW Global, successfully connected Hong Kong (Hong Kong Civil Aviation Department) and Thailand (AEROTHAI) air navigation service providers (ANSPs) via the Asia Pacific Common Regional Virtual Private Network (CRV). The CRV is specifically provisioned by PCCW Global as a robust and secure regional aviation network for the International Civil Aviation Organization (ICAO), a United Nations specialized agency established to manage the administration and governance of international aviation. The successful technical trial linking the first city-pair in the Asia Pacific region to the CRV paves the way for the Hong Kong and Bangkok ANSPs to exchange high volumes of aeronautical information over a highly secure and robust dedicated aviation network. Regional ANSPs have historically not been in a position to share a common network, which resulted in tangled networks belonging to multiple service providers, which in turn led to network management challenges concerning technology upgrades, security, and operations, etc. With airline passenger growth of over 150% in the past two decades, the air transportation industry now carries up to 3.6 billion passengers to more than 3,700 airports annually. This year, airlines are expected to operate more than 38 million flights, and this number is expected to double over the next 10 to 15 years. This dramatic increase in the volume of air traffic has highlighted the need for a more robust and secure aviation network. As a result,

in 2013, the ICAO took the decision to engage with a single telecommunications operator to provide private network services for the exchange of aeronautical information between the various ANSPs.

PCCW Global won the Asia Pacific tender for this provision of the regional CRV. Hong Kong Civil Aviation Department, a pioneer ANSP actively steering the ICAO CRV project, and AEROTHAI have carried out successful trial between the two regions and that the CRV is therefore considered to be ready for operational use by Asia Pacific ANSPs. Mr. Frederick Chui, Senior Vice President of Global Data Sales, PCCW Global, said, "Cyber security is at the heart of the CRV. The success of the trial demonstrates our proven network

services which is critical for the growth of aviation industry. PCCW Global CRV is providing secure closed-user network capability between ANSPs. The CRV also provides for various contingency routing scenarios across PCCW Global's extensive network, ensuring that the service will always be up and running securely." Other added benefits of having the CRV includes supporting various functions of ICAO's Aviation System Block Upgrades (ASBUs), better voice quality, and enhancing the aeronautical information exchange between Asia Pacific and other regions. The CRV service also provides users with performance tracking capabilities and proactive monitoring to ensure network health.

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strategy&

Middle East Telecom Operators to Pursue a New Wave of M&A in Search for Growth and Expansion

The MENA telecom industry is currently pursuing significant growth and expansion within the promising Information and Communications Technologies (ICT) sector, most probably through Mergers and Acquisitions (M&As) to fill their capability gaps. According to a recent study by global management consulting firm Strategy& (formerly Booz & Company), part of the PwC network, global telecom operators have moved away gradually from the

pursuit of growth to expanding into emerging digital domains and new vertical markets, through M&As. In 2015 and 2016 combined, global telecom M&A transactions amounted to 884 deals, valued at almost US$200 billion. Expansion into adjacencies increased sharply in 2015 and 2016, with a total of 213 deals valued at US$14 billion during these two years, versus 184 deals valued at US$5.1 billion during 2013 and 2014. Chady Smayra, partner with Strategy&

Middle East, said: "Scale will remain important for the telecom industry and will continue to fuel consolidation as correlation between profit margins and revenue share have become much closer. However, digital is blurring traditional industry boundaries, allowing tech giants such as Apple and Alphabet to relentlessly expand". "Not only do they pay little attention to barriers to entry, but have strong digital foundations to launch products and services across

various industries. This should serve as an example to all telecom operators and motivate them to advance into the digital arena and become digital conglomerates", he added. However, in MENA region M&A activity has been shy with the region representing a mere 1 percent during 2015-2016., However, the latter trend is expected to change. Amr Goussous, partner with Strategy& Middle East said: "The shift towards expanding into related businesses has an end goal: telecom operators would like to ultimately position themselves as end-to-end ICT providers, specifically focusing on B2B solutions.

The B2B and B2C ICT industry in the GCC is set to grow by 12 percent in the coming 3 years, to reach US$14.3 billion in 2020. IT consulting, system integration, operations and software development will consist a large portion of the expenditure on ICT. Much of this growth will result from national economic and digital transformation plans, with opportunities for public-private partnerships." To take advantage of these opportunities, MENA telecom operators must urgently fill their capability gaps in advanced ICT and digital services, through M&As and joint ventures with nimble tech companies.

Strategy& has outlined four key pillars for MENA telecom operators to reactivate their M&A agenda Charly Nakhoul, principal with Strategy& Middle East, concluded: "As cash-rich MENA telecom operators grow and are pushed into offering digital services, it is essential that they gain competitive advantage and stop perceiving deals as a stand-alone activity. Instead, they must understand that transactions in the digital domain are deeply intertwined with the corporate strategy of existing operations and rely on careful planning."

Sudatel and the ITU Organized an Important Event in Khartoum

Through its training body SUDACAD, Sudatel Telecom Group, in collaboration with the ITU Arab regional office, organized a regional workshop on "Prospects of Smart Water Management in Arab Region". The workshop aims to discuss the increasing role of ICT technologies to manage water resources particularly for agricultural and urban uses in a smart city. Moreover, the workshop will shed light on the opportunities and challenges for expanding smart water management in the Arab region. A forum on Internet of Things for Development of Smart and Sustainable Cities has been also organized to discuss the role of the Internet of Things (IoT) for development and creating a smart world that facilitates sustainable economic development along with a high quality of life within smart sustainable cities. In addition, the forum will discuss the role that Internet of Things (IoT) plays in relation to converging technologies for building smart sustainable cities with integrated ecosystems. The sessions were attended by the minister of Electricity and Water Resources, the minister of Communication and Information Technology, the General Manager of Sudan National Telecom Corporation as well as more than 200 participants representing 12 countries from Arab region, Africa and Europe. The closing session was addressed by H.E. Hassabo Mohamed Abdelrahman, VP of the

Republic of Sudan, who assured, in his speech, the full support of Sudan government to the outcomes of the forum. Dr. Ahmed Awad Elsayed, the Executive Director of SUDACAD, confirmed the continuous commitment of Sudatel to the activities of the ITU. He also pointed out the major role of Sudatel in building the ICT infrastructure in Sudan in order to lead the move for a technological era.

Yahsat Signed a Memorandum of Understanding with BlueTown

Yahsat signed a Memorandum of Understanding (MOU) with the Danish technology and Internet Service Provider Company BlueTown at AfricaCom 2017. The aim of this agreement is to connect the unconnected locations. Both companies will overcome the challenging conditions exist in the most remote areas of Africa by offering an innovative and

reliable solution. Both the companies will support the distribution of Yahsat Internet satellite services to a substantial number of users. The services will be distributed those communities which are utilizing BlueTown's last mile solution. Commenting on the partnership, Farhad Khan, Yahsat's Chief Commercial Officer said: We look forward to working

hand-in-hand with BlueTown to bring universal access to information through a combination of satellite connectivity and Wi-Fi services. By joining forces, we will be able to offer a sustainable Internet solution for unserved or underserved communities. BlueTown solutions vary from single village installations and refugee camps to solutions with up to 200

Wi-Fi hotspots. The Wi-Fi hotspots will be backhaule by YahClick. Henrik Mølgaard, VP of Global Sales at BlueTown said: We and Yahsat share the same vision to spread connectivity to even more communities, where information is not easily accessible. Today, governments are showing great interest in developing rural areas because it benefits everyone, and can help deliver better healthcare and education to small, remote villages. We are delighted to partner with Yahsat, combining their expertise and experience with our innovative solutions, to connect even more rural areas in Africa together. Farhad Khan further added: With the launch of Al Yah 3, we will be able to triple our presence in the African market. Strategic partnerships such as the one with BlueTown are essential to strengthen the economic inclusion of Africa's rural communities. We are now one step closer to achieving our ultimate objective of empowering communities everywhere.

Yahsat Partners with Denmark's BlueTown to Connect the Unconnected

Yahsat, the UAE-based satellite operator, signed a Memorandum of Understanding (MOU) with the Danish technology and Internet Service Provider Company BLUETOWN at AfricaCom 2017. The partnership agreement aims to connect the unconnected by providing high performance Ka-band satellite Internet services combined with BLUETOWN's unique last mile solutions in unserved or underserved locations. Both companies will join forces to offer an innovative, reliable and sustainable solution that will overcome the challenging and harsh terrain conditions present in the most remote areas of Africa. The combination of the partners' technologies will support the distribution of Yahsat Internet satellite services to a substantial number of users within communities utilizing BLUETOWN's last mile solution. BLUETOWN solutions vary from single village installations and refugee camps to solutions with up to 200 Wi-Fi hotspots in a 15 km radius. All solutions are 100% powered by solar energy with rechargeable batteries as a back-up, which provides 24/7 access to the Internet. The Wi-Fi hotspots will be backhauled by YahClick, the high-performance satellite broadband service provided by Yahsat, making it possible for people to browse the Internet, keep in touch, or participate in e-learning, e-health and e-government programs using any smartphone, tablet, or laptop. Commenting on the partnership, Farhad Khan, Yahsat's Chief Commercial Officer said: "We look forward to working hand-in-hand with BLUETOWN to bring universal access to information through a combination of satellite connectivity and Wi-Fi services. By joining forces, we will be able to offer a sustainable Internet solution for unserved or underserved communities, which is cost effective, easy to use and reliable." In addition to its core solution, BLUETOWN has developed a Local Cloud intranet platform to provide fast and easy access to e-learning, e-health and e-government services among others. According to Henrik Mølgaard, VP of Global Sales at BLUETOWN: "We and Yahsat share the same vision to spread connectivity to even more communities, where information is not easily accessible. Today, governments are showing great interest in developing rural areas because it benefits everyone, and can help deliver better healthcare and education to small, remote villages. We are delighted to partner with Yahsat, combining their expertise and experience with our innovative solutions, to connect even more rural areas in Africa together." The announcement falls in line with the upcoming launch of Yahsat's third satellite, Al Yah 3. "With the launch of Al Yah 3, we will be able to triple our presence in the African market, providing connectivity to 20 additional countries. Strategic partnerships such as the one with BLUETWON are essential to strengthen the economic inclusion of Africa's rural communities. We are now one step closer to achieving our ultimate objective of empowering communities everywhere," concluded Farhad Khan.

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ARTICLE

Next Generation 5G Mobile Network

An Essential Element of the Telecommunications Digital Transformation

Saleem AlBlooshi
Chief Infrastructure Officer

Dr. Mahmoud R. Sherif
Senior Director - Mobile Access Planning

The telecommunication industry is undergoing major digital transformation. This digital transformation is fueled by the anticipated next generation 5g network, in addition to a super computing capabilities at the edge cloud, and a layer of artificial intelligence & machine learning on top.

Today, telecommunications form an integral part of the lives of millions of people around the world; a situation which is expected to continue and become even more undeniable in the future. Accordingly, together with the upcoming needs for Smart Cities and Internet-of-Things (IoT), the anticipated challenges of the future are so tremendous that there is a vastly increased need for a new next generation network with even further enhanced capabilities.

1. **DIGITAL TRANSFORMATION – THE NEXT TECHNOLOGICAL REVOLUTION**

All Industries (verticals) are moving towards the "Digital Transformation":
- Schools/Education: Number of Students are exponentially increasing – do we keep building "legacy" schools?
- Financial Sector: Number of Financial transactions and outlets needed are exponentially increasing – do we keep investing in "legacy" financial systems and outlets or adopt and be open to new "digital" currencies and transactions
- Industries/Factories: Digital Transformation is not an option.

Consequently, that Digital Transformation leads to the next technological revolution. In our analysis, we see that this technological revolution is driven by three main stages - as illustrated in Figure 1:
1. The Digital Lifestyle: The Boundaries between the Digital-Physical systems is merging and is driving life & business automation
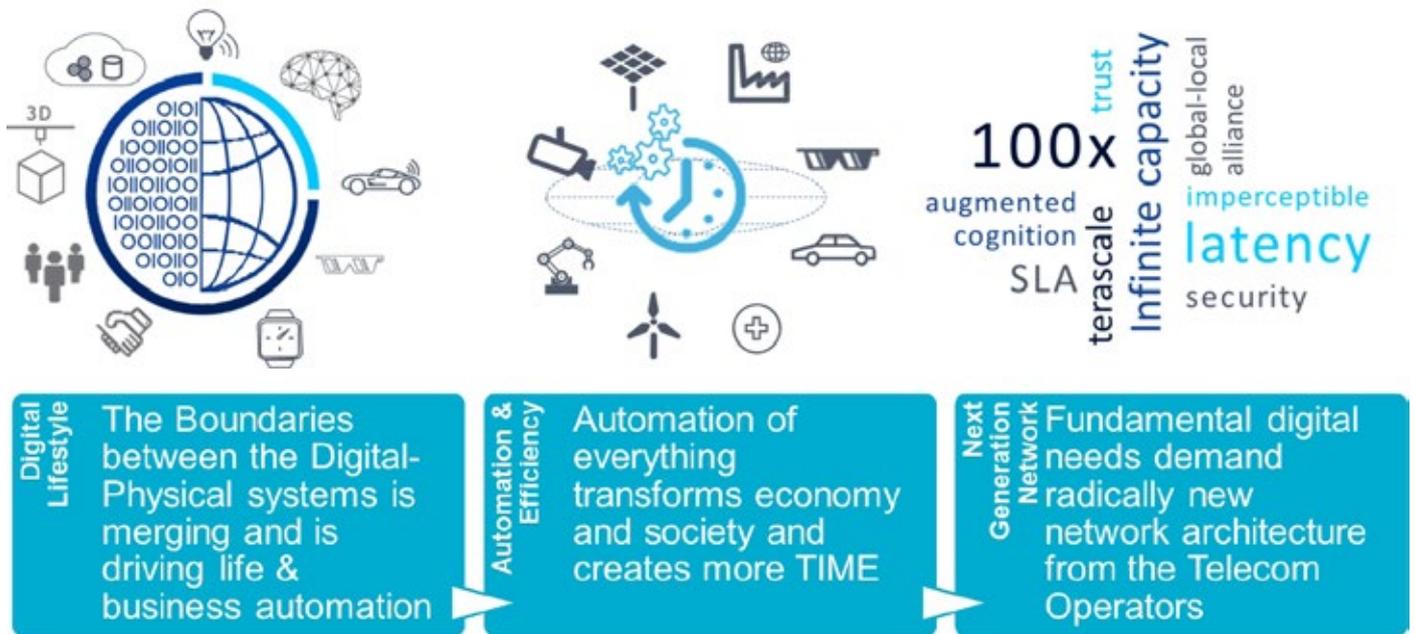
Figure 1: The Next technological revolution is driven by three main stages

2. Automation & Efficiency: That inter-dependency between the Physical and the Digital system will come to a point where the automation of such interaction will become inevitable. We foresee that the Automation of everything has the potential of transforming the economy and society. That is because this automation has the ability to basically create more time through adding more efficiency to everything.

3. Next Generation Network: With this huge automation, comes new needs and requirements. The Fundamental digital needs demand radically new network architecture from the Telecom Operators. These needs range from super speeds, to super capacity to very low latency. All of this leads to what we call the Next Generation Network.

In many ways, 5G will be a facilitator and an accelerator of the next industrial revolution, often referred to as Industry 4.0. The 5G mobile network should be seen as the overall future solution to providing wireless access to people and devices.

Many Telecommunications Operators are already charting their way towards this Digital Transformation.

"As explained by our CEO, organizations are required to work on three fronts in order to ensure sustainable Digital Transformation (DT); 1) (D)SP (Digitizing services provided by the firm), 2) (DS)P (providing digitized services to other firms), 3) both to be supported by an NGN infrastructure," said Saleem AlBlooshi. du's Chief Infrastructure Officer. *"du's recent announcement of Restructuring its organization towards the above vision is driven by these three fronts. Similarly, the Infrastructure Strategy is also being aligned to deliver such NGN Infrastructure at an optimized cost, fast-to-market and with the best -in-class quality".*

2. THE NEXT GENERATION NETWORK

In our view, we see that the next generation network is a combination of three crucial components:

1. A super Access Network – the next generation 5G Network
2. A super computing capabilities that are getting closer and closer to the end user – this is what we technically call the "Edge Cloud"
3. A super brain – which is the "Artificial Intelligence" capabilities on top of the above two crucial components

To start with, 5G will represent a purpose-built technology, designed and engineered to facilitate connected devices as well as automation systems. In many ways, 5G will be a facilitator and an accelerator of the next industrial revolution, often referred to as Industry 4.0. The 5G mobile network should be seen as the overall future solution to providing wireless access to people and devices. It is not about simply providing a super high-speed pipe, it is actually about a combination of use-cases that will drive the 5G.

For many use cases, Latency will be of utmost importance and hosting the apps on the traditional cloud computing centers will not be an option. Instead, processing will have to be done "at the edge." Edge computing, in turn, will create new value for locations scattered around the network that can do the processing, and mobile operators have some advantages (real estate, power sources, high bandwidth connectivity, low-latency networks, incentives to grow a role in edge computing and applications requiring edge computing) that could be leveraged to create a role in the new business.

Artificial Intelligence capabilities when added on top of the above two NGN Components, will basically evolve the concept of "autonomic network management" towards "cognitive network management". In the "autonomic network management", the concept of
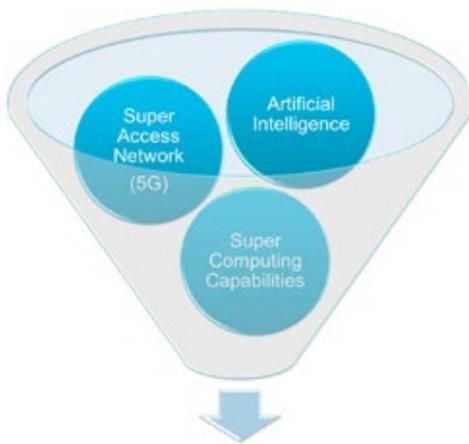
Next Generation Network

Figure 2: The Three Components of the Next Generation Network

"the selves" was introduced, in which network management is expressed through a mixture of the approaches including: self-awareness, self-configuration, self-optimization, self-healing and self-protection. With the advancements of the infrastructure technology for accommodating the next generation of networks, the next level of network management has to incorporate the flexible manipulation of network resources and leverage it with the number of users, the network traffic, the SLAs, and the demanded system performance. And this would basically introduce the "cognitive network management".

From Data Analytics perspective, Artificial Intelligence Computing techniques will also have a huge role in the future next generation network. We as Operators have access to a collection of data

sets (i.e., these data can be highly dimensional, heterogeneous, complex, unstructured and unpredictable) that are so large and complex that the traditional data processing and analysis approaches cannot be employed due to their limited processing space and processing time. Artificial Intelligence will add new Computational techniques and approaches that will play a very crucial role in the big data analysis. It enables the analytics agent to computationally process and analyze the historical and real-time data, and eventually finds out and explain the underlying patterns, correlations, as well as to intensely understand the specific tasks. The computational analysis tools and methodologies convert the Operator's massive amount of raw data (unprocessed, structured/unstructured) into meaningful data/information.

3. SUMMARY

Digital Transformation is a must. Organizations are required to work on three fronts in order to ensure sustainable Digital Transformation (DT); 1) (D)SP (Digitizing services provided by the firm), 2) (DS)P (providing digitized services to other firms), 3) both to be supported by an NGN infrastructure. That Digital Transformation leads to the next technological revolution, which requires radically new network architecture from the Telecom Operators. These needs range from super speeds, to super capacity to very low latency. All of this leads to what we call the Next Generation Network.

From Data Analytics perspective, Artificial Intelligence Computing techniques will also have a huge role in the future next generation network. We as Operators have access to a collection of data sets that are so large and complex that the traditional data processing and analysis approaches cannot be employed due to their limited processing space and processing time.

In our view, we see that the next generation network is a combination of three crucial elements:
1. A super Access Network – the next generation 5G Network
2. A super computing capabilities that are getting closer and closer to the end user – this is what we technically call the "Edge Cloud"
3. A super brain – which is the "Artificial Intelligence" capabilities on top of the above two crucial components

We believe that the next generation network with all its three components will have the potential of transforming the economy and society. 🄲

REGIONAL NEWS

5G Digital Boom to Generate US$ 28 Billion in GCC Revenues by 2023

A 5G enabled digital boom in industries across the GCC is expected to generate around US$28 billion in revenues by 2023, a new report has found. According to Ericsson's November 2017 Mobility Report, the fifth generation of high-speed internet - 5G - will provide a platform for automated systems such as production line robots, automated machinery for agriculture and factories and in fields such as oil exploration. "The Saudi Arabian market has been exploring remote monitoring of oil wells and making temporary networks available in case of disasters," the report said. 5G is also expected to rake-in up to US$242 billion in Information and Communications Technology (ICT) revenues in the Middle East and Africa region by 2026, the report found. As the world becomes better connected, cellular IoT (internet of things) connections in the Middle East and Africa are expected to grow from 35 million to 159 milion between 2017-2023, at a rate of around 30 percent. Greater strength bandwidth will also help to connect a greater number of devices through the IoT network, enabling a 19 percent surge in revenues in the manufacturing, energy and utilities sector in the region. Commenting on the report, Ammar Ammar, chief technology officer, head of networks CU GCC and Pakistan, at Ericsson said "public transport, healthcare, public safety, manufacturing, energy and utilities will grow." The commercial launch 5G network is expected in the UAE in 2020, with an important milestone to that goal being the World Radio Conference in June 2018, where discussions will be held on which spectrum of 5G will be licensed in Europe., the US and Middle East, paving the way for standards and regulations to be set, said Ammar. "You as a subscriber and everybody can own a 5G device by 2020," he said. Mobile operators STC in

Saudi and Etisalat in the UAE are among those competing to be the first to roll out a 5G commercial network in the region, he added. "Roll out is expected after June 2018. For us [Middle East region] standardization will be confirmed in June 2018, and the spectrum will be hand-shaked in mid-2019," he confirmed. Apart from fast internet, 5G is expected to engender a boom in the number of IoT devices such as connected cars, and remote oil extraction, Ammar reported. Such IoT devices depend on access to fast, reliable internet without delays in the time data is transmitted between devices, in order to operate safely, he said. "Three elements for mining 5G [are] speed, enhanced mobile broadband, massive IoT, the number will grow 100-127 times and the critical applications, the ones that demand availability, reliability, and low latency," he said.

Bahrain Tops ICT Development Rankings for Arab World According to ITU

According to the ITU ICT Development Index, this year's Index shows that there has been continued improvement in IDI performance by the great majority of countries. "Drawing conclusions from the report, it is clear that the area of ICT is very dynamic and that another digital revolution is approaching – one which will transform business, government and society. Four key developments are at the heart of this revolution: the Internet of Things (IoT), cloud computing, big data analytics, and artificial intelligence (AI)," the report stated. The Telecommunications Regulatory Authority's (TRA) Board of Directors held their last meeting of the year this week,

where Board members praised Bahrain's outstanding efforts in the development and growth of the telecommunications sector in the Kingdom. In particular, emphasis was put on the significant efforts made by the TRA, resulting in Bahrain maintaining the first-place ranking among the Arab countries. The Index ranks UAE in 40th place overall, Saudi Arabia in 54th place, while Oman features next in 62nd place. However, the Arab region saw the lowest average improvement in IDI values of any region in the Index. Consistent with this, 13 of its 19 economies dropped by one or more places in the global rankings. Saudi Arabia saw a marked fall in both access and use

sub-indices, caused in particular by falls in recorded mobile-cellular and mobile-broadband subscriptions, which were the result of new fingerprint requirements for registration of SIM cards, new legislation limiting the number of subscriptions per user and an economic slowdown that resulted in the departure of many foreign workers. 67Bahrain's most significant improvements were made in the proportions of Internet users and households with Internet access. The early launch of LTE services in 2013 by all three MNOs has contributed to achieving almost universal Internet use in Bahrain.

UAE Adopting Technology with Gusto

The UAE is embracing technology at a faster pace than the West as the government promotes an ecosystem supportive of innovation, according to a study by HSBC. "HSBC's Trust in Technology report indicates that 84 per cent of people in the UAE expect technology to make life easier," said Marwan Mohd Hadi, head of retail banking and wealth management in the UAE. The study, which polled 12,000 people in 11 countries, found that 77 per cent of UAE residents prefer to do most things with new technology when they can, the third

highest after India and China compared to 49 per cent in Canada and 51 per cent in Germany. The UAE had the highest adoption of fingerprint technology at 25 per cent, after China which had a traction rate of 40 per cent and India at 31 per cent. Germany, Europe's largest economy and France which is actively trying to court startups and technology firms in the wake of Brexit came in at 9 per cent while Canada reported 14 per cent. "The UAE continues to create a fertile environment for innovation, both on the consumer and regulatory side," Mr. Hadi said. "Through

its electronic and mobile government services, the UAE has brought innovative technologies to the mainstream early on, which has helped drive understanding and consumption among the public." HSBC said that had partnered with the Dubai International Financial Centre's fintech hive to identify technology innovators that can help banks become more digital and seamless in their operations. Like most banks, HSBC has also been investing in going more digital to meet client demands as well as helping to save money by automating processes and reducing their need for human resources. "While digital technology has created room for more competition outside the traditional banking industry, it has also provided a massive opportunity for banks and fintechs to collaborate more, to bring cutting-edge financial service solutions," said Kunal Malani, regional head of customer value management for the Middle East, North Africa and Turkey at HSBC. "We have also partnered with the DIFC FinTech Hive to identify an emerging generation of technology leaders. Of the many tech aspirants from the DIFC FinTech Hive, we are mentoring a few and are undergoing a Proof of Concept with one."

Pakistan Records Highest Increase in Internet Access Speed in 2017

As per report by speedtest.net it was seen that Pakistan recorded highest increase in mobile internet speed in 2017. It was seen in the Speedtest Global Index that in last 12 months the mobile download speed in Pakistan increased by 56.2%. Pakistan is followed by India and Brazil whose internet speed in 2017 increased by 42.4% and 27.6% respectively. There were

some countries whose mobile internet download speed dropped in 2017. There were Nigeria, Bangladesh that recorded drop in internet speed by 84.% and 7.4% respectively. In China the mobile internet speed increased only by 3.3%. In Laos the largest improvement in mobile download speed was recorded with an increase by 249.5%. Vietnam, Trinidad and Tobago followed with 188.7%, 133.1%, and 133.1% respectively. Due to natural disasters some countries face downfall in their internet speed. Hurricane Maria caused the devastation of Puerto Rico's mobile infrastructure and its mobile internet speed dropped down by 39.8%. Uzbekistan and Côte d'Ivoire also suffered a decline of 31.8% and 26.1% respectively. The Speed-test Global Index on November, Pakistan was ranked 89th in its mobile speed for the month. Pakistan came ahead of both India and Bangladesh. The Speed-test Global Index is an index that compares internet speed data all around the globe on both monthly and annually basis. The data is taken from hundreds and millions of tests taken by individuals all around the globe. Every month this data is updated.

Smartphone Penetration Exceeds Global Average in Saudi Arabia

Saudi Arabia has more than 44 million mobile phone subscribers and an 88 percent rate of smartphone ownership, which is almost double the international average, according to the Communications and Information Technology Commission (CITC). CITC Governor Abdul Aziz Al-Ruwais said at a press conference on Monday that creating an environment which attracted local and international investors and strengthened their trust was a key part of Vision 2030's goals for the communications and information technology sector. The Deputy

Governor of the organization and competition sector, Mohammed Al-Tamimi, revealed that mobile phone subscriptions during the third quarter of 2017 reached 44.04 million, 75 percent of which represented prepaid subscriptions (33 million subscribers), and 25 percent of which were post-paid subscriptions. This showed that the prevalence of mobile phones was very high with a rate of 138.7 percent. Al-Tamimi said that the prevalence of smartphones in the Kingdom had reached 88 percent, which is a relatively high compared to the international average of 45 percent. He said that up until the end of 2016 the number of Internet users had reached 24 million, with a prevalence of 74 percent. The international connection capacity average in 2016 was raised to about 3,185 gigabytes per second, up from 1,484 gigabytes per second in 2015, he said. Al-Tamimi said that the CITC had taken three main initiatives. The first was organizing the market and promoting competition by overseeing controls to mitigate spam messages and by promoting transparency, clarity and the policy of fair use. The second focused on promoting infrastructure and enabling technology by deploying broadband services, and through infrastructure and participation. The third initiative focused on protecting users by updating the regulations that looked after users' rights and launching an index to classify service providers.

GCC Mobile Phone Shipments to Grow After a Gap of 3 Years in 2019

Mobile phone shipments into the Gulf Cooperation Council states are expected to show a growth only in 2019 and 2020 after three years of decline. The market witnessed a growth in 2015, followed by a fall of 22.5 per cent year on year in 2016 and 0.4 per cent decline in 2017 to 26.2 million units. Kafil Merchant, research analyst at International Data Corporation Middle East, Africa and Turkey, told Gulf News that the GCC market is expected to show a decline of 4.3 per cent year on year in 2018. The key markets of the UAE and Saudi Arabia are tipped to suffer year on year declines of 8.2 per cent and 5.7 per cent respectively. The GCC market is expected to see a growth of 2.8 per cent in 2019 and 9.7 per cent in 2020. "The region's mobile phone market is clearly going through a challenging period due to macroeconomic conditions such as weak oil prices and Saudiasation. Saudi contributes around 70 per cent to the total shipments," he said.

Oman's 4G Speed Ranked the Fastest in Arab World

Oman outranked several advanced countries such as the US, France, the UK, Germany and Sweden in addition to all GCC and Arab countries, stated a press release. The report from OpenSignal gathered data from more than 50 billion measurements, collected from over 3.8 million device users worldwide. The data was used to compare 77 countries in terms of their 4G capabilities, which showed Oman's speed as 24.68Mbps compared to the average download speed worldwide of 16.6Mbps. Looking at 4G speeds or 4G availability alone, however, doesn't paint the full picture of how far a country has progressed in its LTE rollout, the report added. "We are thrilled that our country has not just ranked the best in the region, but has also performed well on a global scale," said Said al Ajmi, vice president, operations unit at Omantel. "At Omantel, our goal remains to drive the digital transformation of the sultanate by enhancing Internet speeds and providing superior connectivity to the people. The improvement in ranking from last year is testament to our committed and continued efforts towards this goal." Omantel became the first provider in the sultanate to introduce 4G LTE in 2012. In under four years, the number of network stations grew significantly, reaching 92.3 percent of the populated areas supported by major investments in network expansion. Last month, Omantel announced it has started experimenting with 5G technology for the first time in the Sultanate, in partnership with Ericsson MEA. The development of LTE technology has seen reachability witnessing rapid growth, but the average Internet speed is slowing down and even slightly dropping in some advanced nations, the report notes. The shift in focus from simply providing powerful LTE speeds to providing LTE services to as many people as possible is clear to see. With increased 4G availability worldwide, consumers are now spending more time on faster LTE networks than on slower 3G networks, says the report.

Iran's Average Mobile Internet Speed Sees Boost

Average mobile Internet speed increased by 36% year-on-year in Iran in 2017 reaching 16.74 Mbps, the Internet testing and analysis company Ookla reported. The world's average mobile download speed increased 30.1% during the period. The significant increase has enabled a rise of 19 positions in Ookla's global ranking of countries based on mobile Internet speed. According to the Speedtest Global Index report published on Ookla's website, Iran is ranked 67th among 122 countries. Ookla says that the data for the index comes from hundreds of millions of tests taken by real people around the world using the firm's Speedtest service every day. It adds that the average mobile Internet speed is 16.74 Mbps in Iran, 3.54 Mbps lower than the global average which is 20.28Mbps. Norway has the fastest mobile Internet network with the average download speed at 62.66 Mbps. An earlier report by the International Telecommunication Union published in November indicated that Iran is showing significant improvement in every aspect of the ICT sector. The ITU said Iran is "the most dynamic country" in terms of ICT development in Asia. Ookla's latest findings attest to the ITU position on Iran's progress in the key sector. Over the past decade, there has been acceptable growth in the availability

of communications in Iran, especially in the rapidly expanding urban areas, led by growth in mobile communications, and more recently, with the introduction of third and fourth generation of mobile telecommunication technologies (3G and 4G). According to Telecoms Ministry data, 96% of Iranian cities have access to the 3G mobile Internet while 64% of the cities have 4G coverage. Iran has 1,241 cities and a population of 80 million. Moreover, the ministry says up until June there were 41.5 million mobile Internet subscribers in Iran or 52% of the total population. ITU's latest report on global ICT development which is based on data from the end of 2016 indicates that by then 33.8% of Iranians had a mobile Internet subscription. However, unlike many developing and developed countries, landline Internet services in Iran are of lower quality compared to the mobile services. The average landline Internet speed in the country is 10.28 Mbps, 6.5 Mbps lower than the average mobile Internet speed in the country. Landline Internet speed in Iran is one-fourth of the global average and the country ranks a poor 105th from among 133 studied nations. The landline Internet speed in Iran has seen a slight 1.4% improvement compared to the end of 2016. This is while the global average fixed broadband

speed increased 31.6% during the one year period. About 10.3 million landline Internet subscriptions are registered in Iran which means that 43% of Iranian households are connected to the Internet via such services. Industry observers are of the opinion that the domination of Telecommunication Company of Iran over the establishment of the landline Internet infrastructure has hindered the sector's desirable growth. TCI is a state-owned company with an ironclad grip on the landline telecommunication network. In addition to telephony services it also sells broadband Internet services. The company has laid fiber optic cables in several areas in Tehran and other major cities replacing copper cables that were the norm in the not too distant past. While public funds have been used for establishing the networks, TCI does not allow private ISPs to sell services through the newly-installed cables. To promote competitiveness and loosen the TCI grip, the Communications Regulatory Authority has issued permits to another firm, the Iranian Net Communication and Electronic Services Company to install fiber optic cables. Furthermore, through a recently announced mandate the CRA has obliged TCI to share its networks with local Internet service providers. The two measures have yet to prove their worth.

Pakistan Cellular Mobile Subscribers Increased to 142.4 Million

Cellular Mobile Subscribers Increased to 142.4 Million. The telecom sector of Pakistan has undergone through huge transformations after the arrival of 3G and 4G services in the country. From the increase in mobile phone penetration to the launch of various m-Services; Pakistan's telecom sector has become a success story for some regional countries who are left behind in technological race. This is also evident from the recent stats announced by the PTA. PTA revealed that Cellular mobile subscribers raised to 142.4 million by the end of October. This figure is 1.12% up from the September statistics that were 140.76 million. The total teledensity is 70.71%. Jazz conquered the market with the subscriber base of 53.4 million at the end of October. It is 1.5% up from 52.6 million in September. Telenor stood second position with 40.88 million subscribers which have also increased from the month of September from 40.73 million.

Mobile subscribers across the world have reached to an amazing figure of around 5 billion; as per the latest report of GSMA Intelligence. These 5 billion are the unique subscribers based on real time data of GSMA Intelligence.

Saudi Set to Become Biggest E-Commerce Market in the Region

It is undeniable that the E-commerce and retail are greatly growing in the region especially in the Kingdom of Saudi Arabia and UAE. To shed some light on this, Saudi Gazette met with Dirk Henke, Managing Director, Emerging Markets, Criteo on the sidelines of his participation in Arab Net in which he delivered a keynote presentation. "There is one main aspect we are covering around the dramatic changes that are happening in the E-commerce and retail worlds. We are currently working with more than 17,000 of the leading E-commerce players around the globe. We see how every one of them is developing, we have the exact number and data and we see the challenges and the opportunities. We have identified three main trends that are particularly changing the ecosystem of the E-commerce and retail right now," he said. Henke added that three main trends are happening over the past few years. "Firstly, the consumers are being more empowered and are having higher

about even logistics and this has created a lot of challenges to E-commerce players and retailers because they need to meet those expectations. Secondly, linked to the consumer, is about omni channel (offline &online worlds) the traditional offline retailers that are obviously dominating in the region in terms of share sales, those offline players are struggling while online and digital players are growing and taking over. There is a very interesting trend; consumers are still going to malls especially in the GCC region because it is part of leisure. What is happening is that people still go, but they buy less. Consumers are shifting. The problem is for the retailers because they are still looking at two different worlds online and offline, but it is one consumer that is using both worlds. What needs to happen is that both worlds for the consumer it is already one world but for retail players they need to merge it as well to understand the consumer and react with best marketing message," he explained.

not about having data, it is about being able to activate it. There is one player in the world that is by far dominating and doing a really great job which is Amazon," he said. What is interesting about Saudi Arabia and the GCC region is omni channel. "The merge of offline and online where there is very strong offline shopping and where the digital is greatly growing at the same time. Saudi Arabia will be the biggest E-Commerce country in leading in this field," he commented. There is massive potential and opportunities for this industry and it is growing. Saudi Arabia and the UAE have been among the leading countries globally when it comes to smart phones. "This is obviously supporting the whole trend in E-commerce. Few years ago, most of the E-commerce business were done through desktop devices. No one would use phones. However, now in the countries there are smart phones and the 60% growth of the online purchases this year were done through smart phones. This will have a great impact on consumer behavior and how this whole industry needs to adapt because the phone is with the consumer all the time. So they can buy anytime and anywhere. The majority of the E-commerce transactions in the GCC region are happening from App, then tablets, and then the mobile browser. All E-commerce players must adapt to this," he noted. He stressed that he is extremely optimistic. "It will grow massively in the few upcoming months. If the retail companies and E-commerce players do it right which means merging the offline and online businesses, connect the data for the consumers to understand, that will further boost growth. However, the biggest challenge is to tackle the current obstacles of logistics and payment — logistics to get the products delivered are still taking longer than it should be, the products availability needs development. There are strong local E-commerce players and they will be pushed further to the increased demands and the presence of international players," he concluded.

expectations due to the massive use of mobile phones and devices which gave more power than before. They want everything very soon with perfect smooth payment method. They started to care

The third trend is about the information about the consumer and data. "You have lot more data coming up than before, but there is a big challenge in understanding the data, being able to process it. It is

Egypt Performs First 5G Tests

Egypt launched a live 5G test during the 21st edition of the Cairo ICT exhibition which runs until 06 December, the

Daily News reported. The four telecom companies operating in Egypt launched 4G services by the end of September,

as the market saw the entry of Telecom Egypt as the first integrated operator.

UAE to Generate US$9.2 Billion from Digital Transformation by 2020

The UAE will generate AED 33.8 billion (US$9.2 billion) by 2020 thanks to digital transformation, said Dr. Aisha Bin Butti Bin Bishr, Director-General of the Smart Dubai Office. Speaking during the 'Meet the CEO' event organized by the Government of Dubai Media Office (GDMO) recently. During the event, Dr. Bin Bishr highlighted that the UAE is among the world's leading nations in electronic transformation, which is part of realizing the leadership's vision to make the government the best in the world and providing a comprehensive set of quality services to residents. "The transition from traditional government to electronic government, which started in 2000, was a key step in the government's journey towards achieving the seventh global rank in e-government services," she said. "The initiative announced by Vice President and Prime Minister of the UAE and Ruler of Dubai HH Sheikh Mohammed bin Rashid Al Maktoum to move from e-government to smart government in 2013 reflects his objective of laying the foundations of a

smart city at an early stage, she added." She said that the various initiatives and programmes launched by Smart Dubai aim to use technological innovation and value-added smart solutions to provide services that benefit the public. She also said that Dubai is on track to becoming the world's smartest city, with the government already providing 1,000 e-services. Furthermore, the Smart Dubai Director General also noted that Dubai will generate AED17.9 billion from the Internet of Things by 2020. She also highlighted a number of initiatives that form part of Smart Dubai's strategy such as the IoT Strategy and the Digital Wealth initiative that will assist in the smart transformation of all Dubai government entities. "The Digital Wealth initiative aims to safeguard Dubai's digital wealth while the Dubai IoT Strategy seeks to build the world's most advanced IoT ecosystem in the world's smartest city to improve people's lives," said Dr. Bin Bishr. Meanwhile, shared open data will add AED10.4 billion to Dubai's GDP

by 2021 while introducing blockchain technology in government services will add AED5.5 billion by 2020, according to Dr. Bin Bishr. "Smart Dubai's strategy aims to adopt several new technologies such as blockchain to serve various sectors and improve the efficiency of both government and private sectors." Dr. Bin Bishr pointed out that Dubai is set to be the first government in the world to process all its services through blockchain technology by 2020. "This is why Smart Dubai adopted an integrated strategy that is built on the three pillars of government efficiency, industry creation and international leadership," she said. In addition, Dr. Bin Bishr also noted that the UAE Strategy for Artificial Intelligence (AI) will also bring significant contributions toward enhancing R&D. In addition, AI will be used to provide services and conduct comprehensive data analysis by 2031 in sectors such as transportation, health, airspace, and others. In addition, AI will help reduce the cost of government services by 50 percent annually.

TRA Bahrain Wins CommsMEA's "Regulatory Initiative of the Year" Award

CommsMEA announces the Telecommunications Regulatory Authority of the Kingdom of Bahrain as a winner of the "Regulatory Initiative of the Year" Award for 2017 in the 12th edition of the annual CommsMEA Awards. This award, won by TRA Bahrain comes in acknowledgement of the Authority's efforts that has demonstrated the greatest commitment to developing a healthy, safe and competitive market. The Authority's first award for Regulatory Initiative of the Year comes as a hard-earned win amongst prominent rivals in the region such as the TRA's of the UAE, TRA Oman and CITC Saudi Arabia. TRA's Director of Cyber Security Dr. Khalid Bin Duaij Al-Khalifa commented in regard of this saying, "This award honors the efforts of TRA staff, who have worked diligently to accomplish a significant initiative. The CTI Risk Management Regulation is a major step forward for Bahrain, as no such legislation existed previously in the Kingdom or the region. The regulation

aims to comprehensively manage risks to critical telecommunications infrastructure, thereby ensuring resilience of telecom services that continue to be a key enabler of the country's drive towards

a digitally connected future. It gives me pride to receive this award which serves as a reminder of TRA's and Bahrain's steadfast commitment to excellence and innovation"

PTCL & 1LINK Sign Agreement for Hosting Their Primary Data Center Facility

Pakistan Telecommunication Company Limited (PTCL) has inked a Data Center Hosting agreement with 1LINK Guarantee Limited, which is the largest national payment network in Pakistan for Automated Teller Machines (ATMs) and Point of Sale (POS) network, for a term of three years. This initiative will be deployed at PTCL's Data Center facility in Karachi. The agreement was signed by Farooq Ahmed Jalali, EVP Digital Services, PTCL and Najeeb Agrawalla, CEO, 1LINK (Guarantee) Limited. Those who were

present on the occasion were Dr. Daniel Ritz, President & Chief Executive Officer, PTCL, Umar Farooqi, General Manager, Digital Services, PTCL, Azimullah Khan, CIO, 1LINK (Guarantee) Limited, Bashir Khan, COO, 1LINK (Guarantee) Limited, Azeem Siddiqui, Head of IT, 1LINK (Guarantee) Limited, along with other officials. Dr. Daniel Ritz, President & CEO PTCL, said, "PTCL's customer-centric strategy coupled with its modern & reliable network is the first choice for enterprises to avail one-window ICT

solutions. 1LINK has conveyed its trust on PTCL by awarding its production site to us which validates the reliability of PTCL Data Centers in the region's telecom market." Najeeb Agrawalla, CEO, 1LINK (Guarantee) Limited, said: "The synergy of PTCL with 1LINK is an ideal alliance to achieve 1LINK's goal to deliver exceptional client experience and the inclusion of next-generation applications by virtue of PTCLs' huge and resilient infrastructure. This agreement portrays 1LINK's full confidence in PTCL's network infrastructure and expertise in the field of ICT & Data Center Facility and opens the doors for further collaboration with PTCL on exciting customer-centric products' Farooq Ahmed Jalali, EVP Digital Services, PTCL, said, "We are glad to have 1LINK onboard and support them in achieving operational excellence and scoring benchmarks for financial industry on digitalization through the introduction of technology-based products and services. As the national telecommunication services provider, we are providing services of international standards to the entire business segment in Pakistan ranging from large enterprises to SME customers."

PTA Admits 12.5% Withholding Tax on Mobile Balance Recharge is High

Pakistan Telecommunication Authority (PTA) has admitted that the Withholding Tax of 12.5% on every mobile recharge is high because majority of the subscribers fall below the threshold of being a tax payer and hence, cannot get the paid amount adjusted in their annual tax returns PTA's annual report 2017 states that high custom duty and other taxes on the import of mobile handsets and telecom equipment impede the mobile penetration. Rationalization of Taxes in the telecom sector was a major challenge being faced by the industry for the past few years. Withholding Tax has been brought down to 12.5% from 14% in the Federal budget for FY 2017- 18. However, the Withholding Tax at 12.5% on every mobile recharge is still high. Similarly, Federal Excise Duty (FED) has also been decreased to 17% from 18.5% in the

same budget. However, the tax rates by Provincial Revenue Authorities are still quite high and should be reduced following the example of the Federal Capital. Harmonization of Federal and Provincial Tax Laws is important to resolve the sales tax collection issues and avoid undue litigation between operators and the federation. Telecom sector should be granted the industrial undertaking status so that the mobile operators are able to adjust the income tax paid at the time of import of telecom equipment, which is treated as a final tax liability. The intense price wars among the operators topped with the fierce competition with the Over-the-top (OTT) services and grey traffic is shrinking the Average Revenue per User (APRU) of the industry. Telecom access and expansion is hampered by the lingering Right of

Way (RoW) issues, utility infrastructure and procedural delays in the approvals process at the provincial government's level. PTA has exerted tremendous efforts to improve the national and international connectivity of the country by providing regulatory facilitation to the interested operators. The national fiber optic deployment has increased manifold whereas the results of NGMS spectrum availability are prominent in every walk of life. PTA is ready to face the emerging challenges of the upcoming resource demands by refarming the available spectrum. Moreover, the operators are also investing in the Fiber-to the-Home (FTTH) projects to provide fast, good quality and reliable communication to the consumers.

Internet Banking Witnesses Strong Growth in Pakistan

The adaptation of Internet and mobile banking has witnessed a remarkable growth as the number of users and their use of the banking services through advanced and convenient channels are on the rise. Pakistan Telecommunication Authority (PTA) has issued the 'Regulations for Technical Implementation of Mobile Banking, 2016' to formulate the mechanism of introducing an interoperable mobile banking model. Under these regulations, PTA has invited applications

for the issuance of Third Party Service Providers (TPSP) licenses that will bring true interoperability between the CMOs and financial institutions. TPSP licenses also specify the quality of service benchmarks and security standards required for protecting consumer sensitive data and transaction data. Authorized banks and CMOs are also required to put in place an effective complaint handling

mechanism. It is expected that the TPSP licenses will contribute towards Government's National Financial Inclusion Strategy (NFIS) for inclusion of the financially unserved population into the documented economy. According to State Bank of Pakistan (SBP), a total of 2.3 million Internet Banking users were registered by the end of June 2017 with 25 banks offering a variety of financial services through Internet Banking (IB) like Intrabank and Interbank Fund transfer, scheduled fund transfers, Utility Bills Payments, Mobile Air-time top up, Intra-bank credit card payments, School fee payments etc. In the last outgoing financial year 2016-17, Internet Banking processed 25.2 million transactions worth Rs968.7 billion during FY17 showing Year-to-Year growth of 32.5 % and 10% in volume and value of transactions, respectively. Utility Bills Payments contributed 9.0 million (35.9%) in volume and Rs18.6 billion (1.9%) in value of transactions while the remaining shares consist of other miscellaneous payments including school/university fee submissions, mutual fund payments, credit card payments, etc. The share of Intra Bank Fund transfer transactions is 6.6 million (26.1%) and Rs258.2 billion (26.7%) in volume and value of transactions, respectively, whereas the share of Inter Bank Funds transfers transactions

in volume and value of transactions is 7.5 million (29.7%) and Rs310.1 billion (32%) respectively. Internet Banking also facilitated 88.2 million non-financial transactions which include pay order, cheques books, bank account statements and Debit Cards etc. Mobile Phone or App based Banking is being offered by 18 Banks including Microfinance Banks to 2.5 million registered users, as of June 2017. Mobile Phone Banking processed 7.4 million transactions worth Rs141.4 Billion during FY17 showing YoY growth of 12.1 % and 25.7% in volume and value of transactions respectively. Intra bank and interbank fund transfer were the main contributors in total Mobile Phone Banking transactions. Intra bank fund transfers contributed 2.1 million (28.3%) transactions by volume and Rs60.0 billion (42.4%) by value. Utility Bills Payments got a share of 3.1 million (41.3%) by volume and Rs6.0 billion (4.3%) by value within overall Mobile Banking volume and value transactions, respectively. Despite the double digit growth in the values and volumes of transactions by the users through different banks, the share of the Internet banking in overall transactions stands at a mere 4 percent whilst the share of mobile banking is less than one percent.

ADSL Internet Users Reach 4.5 Million in Egypt

The Ministry of Communications and Information Technology (MCIT) revealed, in a report, an increase in the number of internet users in Egypt to 33.19 million in April 2017, compared to 30.45 million in March and 26.8 million in April 2016. The report showed that the number of ADSL subscribers rose to 4.57 million in April 2017, up by 1.77% on a monthly basis and 12.74% on an annual basis, compared to 4.49 million in March of the same year and 4.05 million in April 2016. The proportion of mobile internet users amounted to 33.22% in April of this year, compared to 30.48% in March 2017 and 27.37% in April 2016. The highest number of ADSL subscribers was in Greater Cairo, accounting for 43% of the total base alone, followed by the Nile Delta region at 29%, Marsa Matrouh at 11%, Upper Egypt at 11%, and Sinai, the Suez Canal region, and the Red Sea at 6%. In addition, 2% of of landline subscribers are government subscribers, next to 9% commercial subscriptions, and 89% household subscribers. The report also indicated that the prices of telecommunications services declined in the first quarter of

this year, compared to the fourth quarter of last year. The cost of internet fell from US$3.8 in Q4 2016 to US$2.8 in Q1 2017, while the cost of mobile service fell from US$1.7 to US$1.2, and the cost of landline service from US$1.2 to US$0.9 in Q1 2017.

Five Companies to Establish Local Mobile Phone Assembly Line in Pakistan

Pakistan is finally going to start manufacturing mobile phones locally as five mobile companies are looking to set up their assembly lines in the country. The development is set to attract foreign direct investment (FDI) worth millions of dollars and is expected to reduce the country's growing import bill. The companies that sought government's permission to set up assembly lines include Haier, G5, Jio Phone, Mobo Mobiles and Foxconn. Last month, the Pakistan Telecommunication Authority (PTA) issued guidelines for setting up assembly lines in Pakistan in a bid to step up the pace of digitalization. "We expect these companies to start manufacturing mobile phones in their plants soon," a senior PTA official said. "Mobile phone users in Pakistan are fast shifting to hi-tech products; of the 24mn mobile sets being imported in a year, almost half are smartphones," he added. Domestic manufacturing was

expected to bring down phone prices and increase demand for smartphones, which would help achieve the goal of rapid digitalization, he claimed. China has been the hub of mobile phone manufacturing over the past one decade due to cheap labor. The resulting economic boom, however, has led to an increase in labor costs, which is also impacting cellphone prices in the international market. "The government should frame a policy to provide incentives to the brands establishing assembly lines in Pakistan," suggested a Samsung official in an e-mail reply to a query. PTA has insisted that all devices assembled in Pakistan should have clear marking stating "Assembled in Pakistan". Initially, the PTA will issue provisional no-objection certificates for six months to the applicants which will, in turn, inform the telecom sector regulator about the setting up of the assembly plants for inspection. After six months,

the applicants will have to demonstrate that the plants are functioning according to international standards. "After evaluation and verification, the PTA will issue formal no-objection certificates following inspection of the assembly lines keeping in view the health, safety and technical standards," the PTA official said, adding "we want to ensure international standards." Establishment of the assembly plants is expected to create a ripple effect and help boost broadband adoption since more people will be able to afford smartphones. Smuggling is a menace in the mobile phone market at the moment, with even branded mobile companies being brought through illegal channels. Recently, the Customs Intelligence Karachi seized 8,000 phones in a single raid, though the manufacturer has been provided the 'Green Channel' a status given to reputable importers which entails less inspection and swift clearance. According to market sources, mobiles worth about US$1bn are smuggled into Pakistan every year. "Increased taxation not only dents the buying power of customers, it also gives high margins on smuggling," a mobile phone retailer said. Even though the government has started curbing smuggling, the PTA is introducing a system through which handsets without a PTA-approved IMEI number will not work in Pakistan. Cellphones without the PTA-approved seals are easily available at reduced prices as compared to phones with the PTA seal. Owing to heavy smuggling, the imported mobile phone sets are cheaper in Pakistan in comparison to even tax-free countries and states such as Dubai.

Bangladesh to Ensure 100 Percent Internet Penetration by 2021

State Minister for ICT Division Zunaid Ahmed Palak said the government would ensure 100 percent internet penetration and 50 percent broadband connectivity for all by 2021. "We have already materialized programs like BanglaGovNet, InfoSarker-2 and impersonating the InfoSarker-3 program under the leadership of Prime Minister Sheikh Hasina and close direction of her ICT Affairs Adviser Sajeeb Wazed. Besides, another program named Connected Bangladesh is in pipeline. With these programs, we will ensure 100 percent internet for all and 50 percent broadband connectivity for the people of Bangladesh," he said.

Palak came up with observations while addressing plenary session of Global Cyber Space Conference 2017 titled 'Bridging the digital divide - empowering by technology led inclusiveness' in New Delhi, India.

ARTICLE

5G Business Models and Investments

The promotion of 5G investments requires a stable, consistent and accurate regulatory framework across all stakeholders. Regulatory bodies should clearly define who is allowed to enter the market through spectrum licensing and by creating conditions that directly influence the possible business opportunities.

The fifth generation of the wireless network technologies will be the major advancement in the provisioning of mobile broadband services. Since the launch of the first generation of mobile communications in 1980, a new generation is being introduced to the ICT market each 10 years. The first commercial 4G mobile services was launched in 2009, nine years after the commercial launch of the first 3G network in Japan, and thus it is expected that 5G deployments will kick off around the year 2020. As opposed to 3G and 4G deployments where requirements were based on voice and higher data rates, 5G is expected to fulfill needs for network upgrade driven by innovative services and not only by demands for enhanced mobile networks. In other words, if there is no demand for innovative services, or if 5G failed to meet the industry's expectations, 5G development is neither necessary nor promising. On this basis, if 5G was successful, it will most likely open the telecommunications market to new entrants that are expected to emerge in indoor small cell provisioning and content delivery, consequently disrupting this whole industry. In a world where everything is digital, smart and hyper-connected, the traditional telecom business ecosystem can no longer cope with this radical change, 5G will expand it to meet vertical sector-specific requirements. To survive this inevitable change, MNOs need to take into account four domains of change; standardization, regulatory, technology, and business.

According to early indications, 5G will not present a smooth, evolutionary improvement over the current standards, but will consist of a collection of different types of technologies that support diverse use cases. Standards bodies and related actors did not agree yet on clear goals and objectives for 5G standards, and it is not easy to predict which alliances will win in each area of dispute and how long it will take. Stakeholders in the telecommunication industry are hoping that various proposals will have crystallized into standards following Release 15 in 2018 and with discussions at WRC-19 in 2019, but they all agree that 5G standards will not see the light before year 2020.

The promotion of 5G investments requires a stable, consistent and accurate regulatory framework across all stakeholders. Regulatory bodies should clearly define who is allowed to enter the market through spectrum licensing and by creating conditions that directly influence the possible business opportunities. Moreover, since networking and processing resource-sharing strategies might be applied for delivering ultra-reliable and low latency communications (URLLC), regulations should secure confidentiality and privacy requirements between all key players in the 5G value chain.

5G will transition the mobile wireless technology from being a significant enabling technology, into a "General Purpose Technology" (GPT). GPT will drive innovation and productivity in nearly all sectors allowing device connectivity, transmission of information, smart transactions execution driven by artificial intelligence, real-time analytics and actionable insights.

The value chain associated with 5G technology will amount to $3.5 trillion between 2020 and 2035 and create more than 22 million jobs (HIS Markit, 2017). To take advantage of the business ecosystems' opportunities, organizations should strive to develop an understanding of the entire system and reinvent themselves. The inter-connected nature of future devices fosters openness and collaboration across industries, which

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complicates building accurate business models. A business model defines how companies generates revenue and make a profit through the overall structures of process, customers, suppliers, channels, resources and capabilities. Multi-

The inter-connected nature of future devices fosters openness and collaboration across industries, which complicates building accurate business models.

partnership, innovation and collaboration will drive innovative 5G business models, allowing them to capture and create value among different stakeholders. 5G will allow exploiting new viable opportunities around Business-to-Consumer (B2C), Business-to-Business (B2B) and Business-to-Governments (B2G) business models. These new opportunities and variations in technology will result in a transition from a market dominated by mobile network operators towards a market supplied by a heterogeneous set of providers with service offerings that respond to the versatile requirements arising from different verticals.

In Europe, the Commission's 5G Action Plan expects 5G revenues for MNOs to reach €225 billion by 2025 (Tech4i2 et al, 2016), however, the business model to achieve these revenues is ambiguous. One of the major challenges in creating business models for 5G is the large number of unknown parameters yet in this ecosystem, such as distance ranges, penetration, capacity, affordability, cost and others. In contrast with previous mobile wireless generation having fewer complexities, where strategist and managers had clear expectations, better

understanding and tested performance before rollout. Although mobile industry is considered a great success so far, there have been many failures in the past three decades mainly due to blindly trusting technologies and an attitude of "build it and they will come", such as WAP, ISDN and Iridium. Therefore, financing 5G investment will be a challenge in the few years to come. In fact, future demand for superfast broadband is still questionable, as there comes a point where ever-fast broadband becomes unnecessary. Moreover, there are still no "killer apps" offered by 5G, the source of funding the required infrastructure is unknown, it is still unclear how much consumers are willing to spend when ARPU trends are decreasing and returns on 4G/LTE investments are not recovered yet.

Given the complexity and uncertainty previously described, is it not evident at this stage which business model is the most plausible, however, there are at least three possible models for the future 5G market. In the first model, mobile network operators along with equipment suppliers will keep on dominating the telecommunications market, thus 5G will be another type of mobile cellular technology. Some small players will have shares in the market, especially in the content provision and over-the-top services. A second more reasonable model is that new entrants to the 5G market will settle locality-based businesses and gateways to the internet, PSTN, 2G, 3G and LTE and compete with mobile network operators in their core business. In this case, a separation of network infrastructure ownership and service provision with application on top of "plain vanilla" services could emerge. A third business model can be driven by deep indoor coverage challenges, in this case, MNOs will rollout repeaters and access points around the buildings, however, third-parties and property

owners will take care of femtocells and deep indoor access. This might also be used as an adjunct of the first or the second previously mentioned model.

MNOs are still taking a prudent and pragmatic view about the 5G journey, as they still have to recover the 4G/LTE network investments before jumping into another major technological generation. If more business ecosystems start to diffuse with many more players and use cases, or if any of the previously mentioned challenges drastically changed, then the 5G rollout may be viable in dense urban settings.

Innovative technologies such as 5G will call for unusual business models that are able to strategically adjust resources to demands and create value proposition

... future demand for superfast broadband is still questionable, as there comes a point where ever-fast broadband becomes unnecessary...

opportunities within a rich ecosystem of service providers. It is crucial for MNOs to be agile and resilient since the forthcoming technologies will drastically increase the volatility, uncertainty, complexity and ambiguity (VUCA) of the telecommunications sector. Despite the conditions and situations of the future ICT markets, it is inevitable for enterprise to embark this journey seeking for superior profitability and growth while societies are looking forward to overcome climate change, water scarcity, limited natural resources and other major challenges using such technologies.

SATELLITE NEWS

Egypt Joins Japan to Launch a Satellite in July 2018

Egypt will launch a satellite with 70% to 80% Egyptian components in cooperation with the Japan Aerospace Exploration Agency (JAXA) in July 2018 Egypt's higher education minister Khaled Abdel Ghaffar said. Egypt will launch a satellite with 70% to 80% Egyptian components in cooperation with the Japan Aerospace Exploration Agency (JAXA) in July 2018 Egypt's higher education minister Khaled Abdel Ghaffar said. The satellite's control unit was implemented by Egyptian engineers at the remote sensing agency, Abdel Ghaffar added, noting that an Egyptian-manufactured camera will be installed on the satellite. He remarked that almost 30 Egyptian engineers are participating in this project, and that the camera resolution Egyptian-manufactured components will be tested after launching the satellite. Egypt will export the new technology after the success of the satellite, he indicated, adding that the current cost of the satellite and training are not huge, compared with the estimated revenues. The minister also announced that Egypt will start establishing a complex for satellite collection on the Suez Road, and the first phase of the Egyptian Space City is scheduled to be completed next year in collaboration with China. The percentage of the Egyptian parts in satellites are likely to reach 100% by 2022.

Sitael Joins Forces with ASI for SmallSat Program

Sitael and the Italian Space Agency (ASI) have signed the prime contract for the Platino program, which aims to develop a new generation of multi-purpose 200kg small satellites for multi-mission applications. For this program, Sitael has built up an industrial team that includes Thales Alenia Space, Space Engineering and Leonardo. According to Sitael, Platino is an all-electric mini-platform suitable for a wide range of missions (hi-res optical, mini-SAR, telecom, etc.), deployable in constellation. "The contract for the creation of Platino will provide our country with several new technologies that can be used extensively on other segments of satellite systems developed by the European industry," said ASI General Director Anna Sirica. "By signing this contract we have settled the foundations of the development for a competitive asset on the international market, by developing production skills for high-tech mini-satellites based on components designed and manufactured in Italy at industrial level. With the Platino program, ASI enters the satellite segment that today is growing worldwide, enabling a wide range of missions, from telecommunications, to Earth Observation (EO) and scientific missions, which are characterized by low cost, an extremely competitive time to market and a natural propensity to develop satellite constellations, the great challenge of the next years in space," said ASI President Roberto Battiston.

Lockheed Martin, NEC to Enhance Satellites with AI

Lockheed Martin will use NEC's System Invariant Analysis Technology (SIAT) in the space domain. SIAT's advanced analytics engine uses data collected from sensors to learn the behavior of systems, including computer systems, power plants, factories and buildings, enabling the system itself to automatically detect inconsistencies and prescribe resolutions. According to Lockheed Martin, its space domain expertise combined with NEC's Artificial Intelligence (AI) capabilities offer new opportunities in developing enhanced integrated satellite and spacecraft operations with prescriptive analytics. These include rapid assessments of changes in performance and the space environment, such as the potential influence of space weather on electronics. With this information, operators can improve product performance and lifecycle efficiency. "Lockheed Martin and NEC are experts in space and systems, and that's the right blend to explore how AI can improve space products for astronauts and people on the ground," said Carl Marchetto, vice president of new ventures at Lockheed Martin Space. "AI can revolutionize how we use information from space, both in orbit and on deep space missions, including crewed missions to Mars and beyond."

ITU to Improve Safety In-Flight by Tracking Aircraft with Satellite

The United Nations specialized agency for information and communication technologies, the International Telecommunication Union (ITU), has now adopted the main technical principals of enhanced aircraft Automatic Dependent Surveillance (ABS) via satellite to track in-flight aircraft worldwide. At any given time, there are approximately 59,000 aircraft in flight worldwide. The ability to effectively track, monitor and report these aircraft is paramount to ensuring the safety of passengers and crew, as well as that of communities on the ground, ITU stated. Aircraft ABS is a technique in which aircraft automatically provide, via a data link, data from the on-board navigation and position-fixing systems, including aircraft identification, four-dimensional position (latitude, longitude, altitude and time) and additional data, as appropriate. The technique is termed "automatic" because there is no intervention from the pilot or interrogation from terrestrial stations, and "dependent" because the data is dependent upon on-board systems such as global positioning system and altimeter. The system relays the information to the relevant airline operators and air traffic control centers who then track the aircraft identifying any anomalies in its flight profile and initiate emergency procedures where necessary, enhancing safety in the sky. Different aircraft ADS systems have been standardized within the International Civil Aviation Organization (ICAO), such as terrestrial Automatic Dependent Surveillance-Broadcast (ADS-B) and Automatic Dependent Surveillance-Contract (ADS-C). The technical principals adopted by ITU support implementation of ADS-B reception via satellite that would enhance surveillance of aircraft, particularly in areas where terrestrial receivers cannot practically be deployed, such as in oceanic, trans-polar and remote regions — and would be a major step in the implementation of the ICAO Global Aeronautical Distress And Safety System (GADSS). "Since the tragic loss of life with the disappearance of flight MH370 in 2014 over the South China Sea, ITU has undertaken activities to improve the tracking of in-flight aircraft using advanced information and communication technologies," said ITU Secretary-General Houlin Zhao. "The adoption of these technical principals for enhanced aircraft surveillance via satellite will make great strides in saving lives.

Industry Consortium Partners with ESA for Government Platform

SES is leading a European consortium of industry partners to sign an agreement with the European Space Agency (ESA) to set up Pacis 1, a new satellite communication platform for governments aimed at making secure satellite communications accessible and available to governments and institutions. Pacis 1 is part of the ESA's Govsatcom Precursor program and is the first step in demonstrating how the European space industry can support the EU's Govsatcom initiative and leverage governmental and commercial satellite services to provide secure access to satellite communications for a range of governmental applications. The project will demonstrate in-field usage of the system for civil protection, border control, humanitarian missions, maritime surveillance, among other applications. Under the agreement, SES will put in place the architecture and service concept of Pacis 1, leveraging the space assets and ground infrastructure of the stakeholders involved in the project. Under the Pacis 1 Public-Private Partnership (PPP), the members of the consortium will be providing specific technological contributions, including engineering, satellite capacity, commercial, and project management. Other industrial partners that have joined the SES-led consortium are Redu Space Services, GovSat, Newtec, QinetiQ and Tekever. "Pacis 1 is an excellent example of how a public-private partnership

at the national level — between a commercial operator and a member state — can evolve in a wider European setting with the support of ESA, to prepare for EU Govsatcom. The pooling and sharing demonstrations are hosted in a European Center of Excellence for space cybersecurity services, and may provide the center with the opportunity for an operational role in governmental secure Satcom at EU level," said Carlo Elia, head of the telecommunications technologies, products and systems department at ESA.

Algeria Launches First Telecoms Satellite

The Algerian Space Agency (ASAL) announced the successful launch of the country's first telecoms satellite on December 10, in partnership with China. The Alcomsat-1 orbiter will provide broadband internet connectivity for remote locations (including schools) and emergency communications, plus broadcasting services.

More Algerian Satellites Set to Be Launched

A national space program, which plans the launch of many cutting-edge satellites, is under consideration at the Algerian Space Agency, Oussedik told a news conference about the successful launch, on December 11, of the Algerian space communication satellite Alcomsat-1 from Chinese station Xichang. He added that the new program will be put into operation after the completion of the national space program 2006-2020, under which five satellites have been successfully launched, the latest of which is Alcomsat-1. The launch of the satellite Alcomsat-1 is meant to "boost national sovereignty in telecommunications, through the set-up of an appropriate, efficient and secure transmission system," according to Oussedik. The satellite will make it possible for the telecommunication services to continue working in case of major natural disasters, as it will allow an increase in the capacity of national telecommunication systems, the relocation of activities and services which are mostly based in the country's north through an optimized telecommunication network, the reduction of the costs resulting from the use of international telecommunication systems, in addition to a transfer of technology, he explained. Alsatcom-1, the outcome of a partnership with China, has 33 transponders, nine of which are meant for digital radio and TV broadcast, as well as distance learning, telemedicine and videoconference services. The new satellite will allow to get high-speed internet (20 Mb/s) on Ka-band, which covers the whole Algerian territory. It will also help in providing mid-speed internet (2 Mb/s) to users in North Africa via Ku-band, which, in addition to Algeria, includes Morocco, Mauritania, Western Sahara, Mali, Niger, Burkina Faso, Libya, Tunisia, North of Chad and north of Sudan.

New Venture to Manufacture Ultra-Small Satellites for LEO

Abel Avellan, who founded Emerging Markets Communications (EMC), has launched a venture called AST&Science to manufacture a new generation of ultra-small satellites. According to Avellan, the company's goal is to build ultra-small satellites to be placed into Low Earth Orbit (LEO). The satellites, dubbed Microns, weigh approximately 7oz and are designed to work in concert with larger nano- and micro satellites. AST&Science has already completed the system design of its proprietary technology and has filed patents for key elements of its intellectual property in the United States, Europe, Japan and other countries. The company is preparing to commence manufacturing in mid-2018, and is actively investing in related technologies of ultra-small satellites. It is currently bidding for the first launch partner both in the United States and internationally. "The satellite industry has been slow to adopt miniaturization technologies," said Avellan. "What happened to mainframe computers will happen to current and future satellite architectures based on today's technology. AST&Science, with its proprietary technologies, will be at the forefront of this miniaturization revolution in space, enabling us to create a totally new business model that will dramatically change the way satellites are designed, manufactured and launched."

SES to Enable Satellite 5G Demonstrations for ESA

SES is expanding its efforts to support 5G developments as part of the European Space Agency's (ESA) Advanced Research in Telecommunications Systems (ARTES) project, SATis5, where it will be enabling demonstrations of satellite-terrestrial integration for 5G networks. The testbed infrastructure will comprise SES' fleet of Geostationary Earth Orbit (GEO) and Medium Earth Orbit (MEO) satellites, which will be integrated with terrestrial networks. In addition to providing the space segment, SES' headquarters in Luxembourg will also host a SATis5 testbed node with prototypes of networks for satellite integration, along with other nodes located in Berlin and Erlangen, and an additional portable node. SATis5 will act as a best-practice pathfinder for the trials via live demonstrations of 5G satellite use cases such as Enhanced Mobile Broadband (eMBB) and massive Internet of Things (mIOT) usage scenarios. The demonstrations, which will start in 2018, will showcase satellite integration capabilities in a mix of infrastructures for

5G and foster adoption of satellite as part of the 5G architecture. In addition, the SATis5 testbed will support 5G standardization initiatives including the 3rd Generation Partnership Project (3GPP).

Google is Using Light Beam Tech to Connect Rural India to the Internet

Google is preparing to use light beams to bring rural areas of the planet online after it announced to a planned rollout in India. Alphabet's X — the company formerly known as Google X — is working with a telecom operator in Indian state Andhra Pradesh,

home to over 50 million people, to use Free Space Optical Communications (FSOC), a technology that uses beams of light to deliver high-speed, high-capacity connectivity over long distances. Now partner AP State FiberNet will introduce 2,000 FSOC links starting from January to add additional support to its network backbone in the state. The X project is aimed at "critical gaps to major access points, like cell-towers and WiFi hotspots, that support thousands of people," the company said. The initiative ties into a government initiative to connect 12 million households to the internet by 2019, the U.S. firm added. The idea for initiative came after X used FSOC to deliver information for its Loon connectivity project which uses hot air balloons to deliver internet connectivity in remote areas. Baris Erkmen, who leads the initiative, explained the team later realized it could become a standalone opportunity in its own right. X will deploy a team to Andhra Pradesh to work on the rollout. Erkmen said it is also open to doing deals with other organizations.

US Air Force Closer to Launching First GPS 3 Satellite

The Next Generation Operational Control System (OCX) successfully established remote connectivity and communicated with the first GPS 3 satellite, further validating that the U.S. Air Force is ready to launch the first in a series of new GPS assets. According to the Air Force, GPS 3 Space Vehicle 01 (GPS 3 SV01), the first of 10 GPS 3 satellites designed by Lockheed Martin and OCX, successfully completed Factory Mission Readiness Testing (FMRT) on Nov. 2. The FMRT validated

the command and control interaction between the satellite and the OCX's Launch and Checkout System (LCS) through a simulated full launch and early orbit mission event sequence. During this end-to-end system demonstration, Raytheon's OCX LCS software installed at Lockheed Martin's Launch and Check Out Capability node in Denver, Colorado sent command signals to Schriever Air Force Base in Colorado Springs. From there, the commands were uplinked back

to the GPS 3 SV01 satellite, currently awaiting a call up for launch at Lockheed Martin. The demo further verifies the space-to-ground compatibility between GPS 3 satellites and OCX, the Air Force stated. During a 2013 compatibility and integration test, Lockheed Martin's GPS 3 Non-Flight Satellite Testbed (GNST), a full-sized, functional satellite prototype, also connected with and received commands from an earlier version of the OCX LCS software. In September, the Air Force declared GPS 3 SV01 "available for launch," with launch expected in 2018. The successful FMRT was the final validation that GPS 3 SV01 is ready to be shipped to the launch pad. OCX will control all legacy and new signals, provide protection against evolving cyber threats, and reduce operation and sustainment costs through efficient software architecture, automation and performance-based logistics, according to the Air Force. The Global Positioning Systems Directorate at the U.S. Air Force Space and Missile Systems Center lead the GPS 3 and OCX teams. Air Force Space Command's 2nd Space Operations Squadron (2SOPS), based at Schriever Air Force Base, Colorado, manages and operates the GPS constellation for both civil and military users.

Ariane 5 Logs 82nd Successful Mission with Galileo Launch

Arianespace has successfully launched satellites 19, 20, 21 and 22 in the Galileo constellation, using an Ariane 5 heavy launcher on behalf of the European Commission and under a contract with the European Space Agency (ESA). The launch took place on Dec. 12 from the Guiana Space Center (CSG), Europe's spaceport in French Guiana. Arianespace has now orbited a total of 22 Galileo satellites, using Soyuz and Ariane 5 launchers. The launch provider will orbit four more Galileo satellites in 2018 using an Ariane 5, then Ariane 6 will take over in 2020 and 2021. This mission marked Arianespace's 11th and final for 2017. In September, the European Commission and ESA chose to continue deployment of Galileo satellites with two Ariane 62 launches, making them the first customers for Ariane 6. Galileo is Europe's own Global Navigation Satellite System (GNSS). Under civilian control, Galileo offers high-precision positioning around the world. Its initial services began in December 2016, allowing users equipped with Galileo-enabled devices to combine Galileo and GPS data for better positioning accuracy. The complete Galileo constellation will comprise a total of 24 operational satellites, including two spares. Following this week's launch, the European GNSS Agency (GSA), in charge of managing and operating the European Geostationary Navigation Overlay Service (EGNOS) and Galileo satellite navigation systems for the European Union (EU), will be responsible for operating these satellites as soon as they separate from the launcher. Satellite positioning operations and system operation will be carried out in conjunction with ESA. This year, Arianespace launched a sum of 20 satellites for 18 different customers, with total weight injected into orbit of nearly 60 metric tons, including 53.8 metric tons just for satellites sent into Geostationary Transfer Orbit (GTO).

Astro Digital Selects Vector to Launch its First 12 Satellites

Vector announced it will conduct a dedicated launch in 2018 featuring one of Astro Digital's satellites for remote sensing applications. Astro Digital plans to engage Vector to launch at least 12 such satellites as part of a larger constellation, with an option to then continue operations at a pace of two to four dedicated satellite launches per year.

Astro Digital's Landmapper HD satellite will catch a ride on Vector's Vector R launch vehicle in 2018. Headquartered at NASA Ames Research Park in California, Astro Digital's mission is to monitor the whole Earth, every day, from its constellation of small satellites. "Having the opportunity to put a payload on Vector's recent sub-orbital launch and being able to test our hardware under real-life conditions really solidified our decision to join forces," said Chris Biddy, Chief Executive Officer (CEO) and co-founder of Astro Digital. "Launches continue to be one of the biggest risk factors for our business, but partnering for a dedicated launch with Vector means we set the orbit and we set the launch date, which effectively lowers our risk and cost." After securing a $21 million Series A round led by Sequoia Capital earlier this year, Vector has accelerated its flight test series and initiated pathfinding operations at several proposed launch sites. In August, the company completed a successful commercial sub-orbital mission at Spaceport Camden in Georgia and more recently announced that it will conduct at least three orbital launches from Virginia Spaceport's Mid-Atlantic Regional Spaceport over the next two years. Vector recently opened its Silicon Valley headquarters in San Jose, California and will break ground on its launch vehicle manufacturing facility in Pima County, Arizona next year.

RUAG Space to Build the Brain for Next 12 Galileo Satellites

Arianespace launched four additional Galileo satellites this afternoon from Kourou in French Guiana, aboard an Ariane 5 rocket. These are all carrying a control and data unit from RUAG Space, as well as further electronics and mechanical products designed and manufactured at sites in Sweden, Switzerland and Austria. OHB System, which is the prime contractor for the Galileo satellites, has now tasked RUAG Space to produce an additional 12 control and data units for Galileo. This on-board computer controls and monitors the navigation payload and numerous other subsystems. It will also monitor the satellite's status, for example

the temperature – taking actions to ensure that the satellites remain fully functional. The company will deliver these units between November 2018 to October 2019. Further electronics contributions include the receiver electronics and antennas on the satellite needed to determine the position of a person or item on earth. Furthermore, RUAG provides the power supply modules for the Search and Rescue (SAR) transponder. RUAG Space will also supply the mechanisms used to align the Galileo satellites' solar array. As a satellite orbits the Earth, it continuously changes its alignment to the sun. Special mechanisms known as

Solar Array Drive Mechanisms (SADMs) ensure that the solar array precisely tracks these changes in order to obtain the maximum energy yield by optimizing the orientation of the solar cells relative to the sun. Lastly, RUAG Space is producing a thermal insulation blanket. The Galileo satellites will be wrapped up almost entirely in this blanket to ensure that the sensitive onboard electronics are not damaged by the extreme temperature fluctuations encountered by the satellites in space. The launch will bring the total Galileo constellation to 22, boosting the global availability of navigation signals.

Mu Space Receives 15-Year Satellite License in Thailand

Thailand's National Broadcasting and Telecommunications Commission (NBTC) has awarded mu Space a license to operate a satellite service in the country. The 15-year license covers the operation of a satellite and provision of satellite-based services until 2032. According to Thailand's telecom industry database, nearly 12 percent or 8 million of the country's 68 million population have access to broadband. Mu Space Chief Technical Officer (CTO) Samathorn Teankingkaeo said the company intends to provide satellite services that are affordable, easy to install and offer coverage that includes Thai rural communities. "We want to help improve the quality of life. Through satellite, we can provide invaluable solutions to support the government's Thailand 4.0 economic policy, and bridge the digital gap between urban and rural areas," said Samathorn. In September, mu Space became Blue Origin's first customer in Asia when it signed a deal to partner on a future satellite launch aboard its New Glenn orbital rocket by 2021. Mu Space also signed an agreement to support the Thai government's vision of building a

digital park and a learning academy for Internet of Things (IOT). The facilities will be built on a 960,000 sqm land in Chonburi, located within the Eastern Economic Corridor (EEC) zone.

SSL's PODS to Deploy SmallSats to Supersynchronous Orbit

SSL has partnered with a team at NASA's Jet Propulsion Laboratory (JPL) and the University of Michigan (UM) to conduct a Phase A mission study under NASA's Explorers Program. SSL's role in the mission, called the Sun Radio Interferometer Space Experiment (SunRISE), is to provide a ride beyond Geosynchronous Earth Orbit (GEO) for a constellation of science-gathering small satellites. SSL will use its Payload Orbital Delivery System (PODS) technology to dispense the small satellites on-orbit as

free-flyers. Mission Principal Investigator Justin Kasper, associate professor at the University of Michigan's Climate and Space Sciences and Engineering Department, will lead the SunRISE team that will use the small satellite constellation, operating as a Synthetic Aperture Radio (SAR) telescope, to address the critical heliophysics problems of how solar energetic particles are accelerated and released into interplanetary space. According to SSL, by sharing a ride to space on an SSL-

built satellite with PODS, the SunRISE mission benefits from the frequency of commercial launch schedules and a significantly reduced launch cost compared to a dedicated mission. SSL developed PODS in conjunction with the Defense Advanced Research Projects Agency (DARPA), with the expectation that it will play a key role in enabling cost-effective, high tempo access to space for small payloads on a variety of commercial, government, and scientific missions beyond Low Earth Orbit (LEO).

Eutelsat to Support Defense Networks in Colombia

The Colombian Ministry of Defense has signed an agreement with Eutelsat for capacity on the Eutelsat 115 West B satellite. The multi-transponder contract, the first between Eutelsat and the Colombian Ministry of Defense, follows the signature of a government-to-government agreement between France and Colombia designed to encourage cooperation in the context of the France-Colombia Year. The Colombian government will leverage Eutelsat 115 West B over the Andean Region to host Ministry of Defense networks across the country, used by the General Command of the Colombian Military Forces, the Army and the Air Force. "In the interests of improved organization of the satellite communications networks operated by our defense forces, the Colombian Ministry of Defense decided to seek a single contractor to meet its diverse needs. Of the countries we invited to contend, France, through Eutelsat, presented the best economic and technical proposal, leading us to select Eutelsat 115 West B," said General Jose Javier Perez Mejia, Colombia's deputy minister of defense.

Australia's Buccaneer Satellite Launched into Orbit
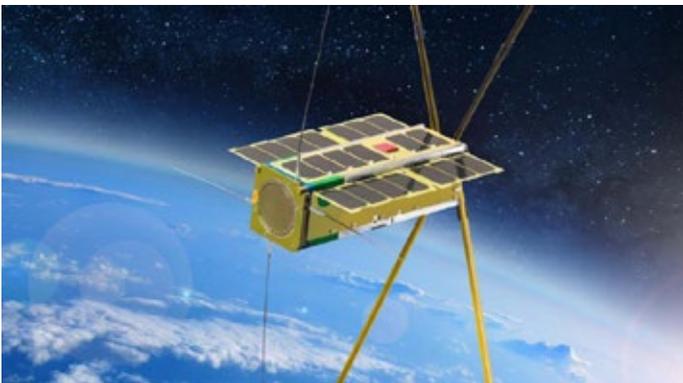
The Minister for Defense Marise Payne has announced that the Buccaneer cube satellite has been successfully launched into orbit. The miniature satellite was launched from Vandenberg Air Force Base in California, US, on a Delta-II rocket. Communication with the satellite has already been established, Payne stated. The satellite was developed by the Australian Department of Defense (DoD) and the University of New South Wales to support the country's Over-the-Horizon radar capability. Payne said: "Small, low-cost satellites like Buccaneer provide a unique opportunity to support Australian Defense Force capabilities and to rejuvenate Australian space research. "Buccaneer is designed to improve understanding of the outer atmosphere, in particular the Ionosphere, which plays a key role in Australia's world-leading Over-the-Horizon radar capability." The satellite will be used to test key technologies in preparation for the calibration of the Jindalee Over-the-Horizon Operational Radar Network. Payne added: "The government will invest significantly in space-related projects for defense over the next two decades and it has made a commitment to establish a national space agency to drive Australia's involvement in space." Last year, Buccaneer underwent tests that simulated the harsh environment of space. According to the 2016 Defense White Paper, space research and space-based systems play a key role in Australia's defense capability and national security.

ViaSat 2 Successfully Transmits First Data from Space

ViaSat announced the ViaSat 2 satellite has successfully arrived in Geostationary Earth Orbit (GEO) at 69.9 west longitude, and has transitioned into orbit normal mode (Earth pointing) with its reflector and radiator deployments now complete. The company also confirmed the satellite has commenced in-orbit testing, including the key milestone of the first end-to-end system test, with the ViaSat 2 satellite transmitting and receiving data to and from the new ViaSat ground segment. Arianespace launched ViaSat 2 from Kourou, French Guiana, on June 1. The satellite employed a hybrid propulsion approach, using both traditional chemical as well as electric propulsion. The chemical propulsion subsystem was responsible for initial orbit raising and performed according to plan, setting the stage for the follow-on ascent to GEO using electric propulsion, which was completed last week. Viasat spacecraft partner, Boeing Satellite Systems International, controlled and monitored ViaSat 2 throughout the orbit raising process, flying the satellite from its mission control center in El Segundo, California. Following completion of the in-orbit tests, the ViaSat 2 satellite is scheduled to enter commercial service in February 2018, where it will enable the delivery of advanced residential, enterprise, government and In-Flight Connectivity (IFC) services.

SSTL to Build Video Earth Observation Satellites for Earth-i

British startup Earth–i announced that it has ordered the first five satellites from Surrey Satellite Technology (SSTL) for its new Earth Observation (EO) constellation. Earth-i plans to deploy the first constellation able to provide full-color video from orbit. According to Earth-i, the constellation's capabilities include the provision of high-frame rate images with resolutions better than 1 meter for

any location on Earth; the ability to film moving objects such as vehicles, vessels and aircraft in Ultra High-Definition (Ultra-HD) color video; rapid tasking of satellites to take images or video; and fast data download within minutes of acquisition. Footage recorded by Earth-i's fleet of satellites will be available for analysis within minutes of being taken, the company stated, and will improve

decision-making and response times in a variety of scenarios from change detection and object identification to disaster response and infrastructure monitoring. The creation of Earth-i's constellation starts with the imminent launch of its preproduction prototype satellite, which was also designed and manufactured in partnership with SSTL. This prototype will demonstrate and prove technology and processes for the future constellation including tasking, data downlinks to ground stations, image quality and video from space. Earth-i plans to launch the first five SSTL satellites in 2019. The origin of Earth-i's constellation lies in the Carbonite 1 technology demonstrator satellite launched by SSTL in July 2015. The batch of production satellites ordered by Earth-i will be based on the second prototype satellite about to be launched into orbit, but will incorporate significant additional enhancements already in development by SSTL for Earth-i.

Panasonic to Deliver Enhanced IFC with Eutelsat 172B

With the entry into service of the Eutelsat 172B High Throughput Satellite (HTS), which launched in June, Panasonic Avionics Corporation will now be able to deliver enhanced in-flight broadband connectivity, live television and mobile phone services to aircraft flying high traffic routes across the Asia-Pacific region spanning the West coast of North America to Asia, and down to Australia and the Pacific islands. Panasonic is layering HTS capacity over key air traffic areas across its global satellite network, to ensure it can meet the growing connectivity demands of airlines and their passengers. Maritime operators will now have improved coverage and availability across key Asia-Pacific shipping routes using the Eutelsat 172B satellite, with the faster data speeds enabling Asia's continued growth in the global maritime sector. Oil and gas exploration customers across the region will also benefit from the new cost-effective HTS service for secure broadband networking to deliver more efficient operations and enhanced

crew welfare solutions. "Our service to the mobility market in Asia continues to grow exponentially. For the first time ever, airlines and passengers will reap the benefits of Ku-band HTS technology as they fly across the Pacific as well as up and down the coast of Asia into areas across Oceania," said Hideo Nakano, Chief Executive Officer (CEO) of Panasonic Avionics Corporation. "We are very excited to add this significant improvement to our global network and look forward to unveiling the new passenger experience and operational efficiency capabilities that are only possible with this truly unique satellite." "Eutelsat 172B's entry into service is a milestone in the journey we've traveled with Panasonic since they shared with us their roadmap of connectivity requirements in Asia-Pacific. We're proud to see our all-electric satellite get to work for a major client, delivering uniquely-designed capacity for in-flight and maritime connectivity and also ready to serve corporate network, cellular backhaul, video and government markets.

From its strategic location at 172 degrees east, Eutelsat 172B is now open for business over land and sea from Alaska to Australia," added Rodolphe Belmer, Eutelsat CEO. Eutelsat 172B HTS uses a multi-port amplifier, which allows power to be dynamically moved among the HTS beams to meet demand. This ability for the HTS beams to "follow" aircraft and other mobile users enables Panasonic to better meet customer demand and cost-effectively ensure consistently high levels of service in a way that other service providers cannot match. The entry into service of Eutelsat 172B coincides with the introduction of Panasonic's new BC-03 modem, developed in conjunction with Newtec, which also caters for future demand by supporting speeds of up to 250 Mbps to aircraft. More than 1,800 aircraft flying routes all around the world use Panasonic's global high-speed in-flight connectivity service. The company expects more than 10,000 aircraft to be connected to its global high-speed communications network by 2025.

ARTICLE

Fiber is King

Bader Saud Al Zeidi
General Manager Network Planning & Technology
Oman Broadband

Contrary to the misconception that the advent of 5G mobile wireless technology will render Fiber Optic Cable (FOC) obsolete, 5G will in fact drive demand for fiber, as well as strengthen the business case for FTTH networks, avers a key official of Oman Broadband Company (Oman Broadband).

While it is true that 5G will make available higher bandwidths to customers, in the order of Gbit/s or109 bit/s, a single optical fiber is ultimately capable of carrying 1 Petabit/s or 1015 bit/s, on a single wavelength.

Simply explained, 5G networks are actually a mixture of radio and fiber, and FTTH service will ultimately evolve to offer Terabit/s and more, well beyond the capabilities of radio services.

So what is behind the misconception? According to Bader Al Zeidi, General Manager Network Planning & Technology at Oman Broadband, the fallacy stems from the mistaken belief that 5G networks may offer Gbit/s services in the future – the same way how FTTH networks offer Gbit/s services today. As most users connect their devices to the network using wireless, they incorrectly assume that the arrival of 5G will spell the end of FTTH, he explains.

Not only is this claim completely untrue, but in the race for bandwidth fiber will emerge as the unquestionable winner, according to Bader. "While it is true that 5G will make available higher bandwidths to customers, in the order of Gbit/s or109 bit/s, a single optical fiber is ultimately capable of carrying 1 Petabit/s or 1015 bit/s, on a single wavelength. With the advent of DWDM technology this can be increased by a factor of 96, by allowing 96 different wavelengths to be multiplexed into a single fiber, according to latest standards. Therefore the requirement to provide high bandwidth to each home is enduring, as bandwidth demands continue to increase," he stressed.

This is also evident for the 'law of internet bandwidth' which over the past 30 years has demonstrated that the demand for fixed bandwidth has doubled every 18 months with no indication in sight that this trend is change (see chart below). "We are therefore confident that the demand for bandwidth at home will continue to increase," Bader noted.

Also auguring well for the strong growth of fiber, the General Manager points out, is the need for an optical fiber connection to each 5G base station when 5G is eventually rolled out – a process called 'backhauling'. After all, fiber is the only medium that can carry the required bandwidth economically.

Additionally, as most 5G base stations will be located in populated areas within the FTTH coverage zones, it actually strengthens the business case for FTTH. This is because 5G backhaul services can be offered from the same FTTH infrastructure at little extra cost, according to the official.

Fiber enjoys unparalleled superiority over 5G. The light that is carried by an optical fiber typically has a wavelength of 1.5 um, or a frequency about 20 Petahertz (20 x 1015 Hz). 5G technology, on the other hand, generally uses microwave technology with frequencies in the range 1 to 5 GigaHz. Since the bandwidth carried depends on the frequency of the carrier, fiber can ultimately carry bandwidths of about 1 Petabit/s, far higher than 5G.

In addition, it is now possible to carry multiple wavelengths (or carriers) in a single fibre without interference, and a single fibre can carry up to about 96 carriers. The transmission speed in each medium is similar and both determined by the speed of light in their respective media.

"There is no doubt that 5G technology will be a substantial improvement on 4G, and will allow bandwidths of up to about 1 Gbit/s to be offered to each customer. Remember that this is shared bandwidth so as usage increases the available bandwidth to each customer decreases, and hence cell sizes will also decrease to restrict the number of users on each cell. Moreover transmission powers will decrease, allowing an increase in battery life for such devices," said Bader.

The telecom services professional sees the two technologies as complementing each other rather than competing with each other. "Most customers connect their devices to the network using wireless, be it 5G or WiFi. However, these wireless access points are all fed by fiber, be it Fiber to the Home (FTTH), or Fiber to the Base Station. Since most 5G base stations will be located in populated areas, where fixed FTTH service is also required, there will be a great synergy between 5G and FTTH."

Likewise, if FTTH infrastructure is rolled out, then fiber can be provided to 5G base stations at little incremental cost, since fiber will already pass through the required locations. Conversely, if fiber infrastructure is laid out for 5G base stations first, then it enables FTTH to be installed at a later date at much lower costs, he explained.

In either case, these converged network approaches complement each other, and allow synergies between the two technologies, whilst strengthening the business case for fiber. Above all, the demand for fiber increases, since there is a demand for two applications, Bader pointed out.

The executive cited in this regard the example of Verizon in the USA, which has announced a major fiber purchasing agreement with Corning, as the telecom giant prepares for 5G services, as

well as the expansion of its FTTH networks. "So we view fiber as the cornerstone building block of the next generation network," Bader quoted as referenced from Lowell McAdam, CEO & Chairman Verizon, 18/4/2017.

Muscat-headquartered Oman Broadband is rolling out a national broadband network in support of the Sultanate's National Broadband Strategy. The company has been incorporated as a private entity to focus on the deployment of a passive fiber network infrastructure, providing equal and open access to telecommunication service providers, on a wholesale basis, and owners and operators of private networks, on a retail basis, thereby enabling end users to efficiently leverage high speed fiber in Oman.

As a result of Oman Broadbands's broadband infrastructure, the main service providers Omantel, Ooredoo and Awasr can sell high speed internet services offered over these fibre connections. "Oman Broadband is set to complement these companies by offering them a unique and cost effective way to provide better services to their customers in these challenging times, with low financial risk. In turn, Oman Broadband will be able to provide fiber connections to 4 and 5G base stations located in these populated areas."

Wholly Omani government owned Oman Broadband is moving energetically to expand its fiber footprint across Oman, while also adding to the potential for more 5G mobile base stations. In addition, the company is building long-haul fiber services as part of a national backbone network to interconnect major centers of the population.

"Last but not least, we are now extending our reach into rural areas, so that we may offer broadband services to the more remote and less populous regions which nevertheless need broadband access. There are many challenges to be overcome in these areas, and we are looking at many options and striving to find a viable solution," said Bader.

In essence, 5G will materialize in its true sense only with the availability of fiber on its backhaul side, stressed Bader. "All telecom operators need to gear up for more fiber to support the evolution to 5G and here, where we as Broadband comes to support and complement their effort for a better preparation to 5G," he added in conclusion.

Data based on UK market
Source: P W France 2016
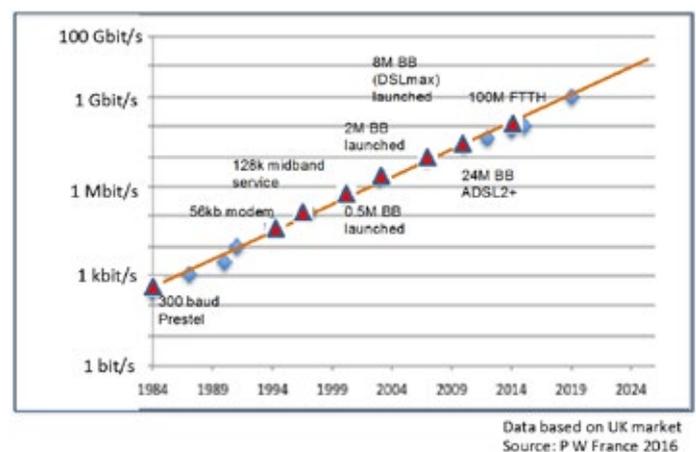
WHOLESALE NEWS

Etisalat Revamps Roaming Packages for Prepaid and Postpaid Customers

Etisalat has announced the revamp of its roaming packs for both prepaid and postpaid customers to give them flexibility and more affordable choices of tailored plans to stay connected with their family and friends while travelling outside the country. The new roaming packs will offer a worry free experience to customers traveling abroad in more than 100 countries as the packs cover all communication needs of making, receiving calls and mobile data removing the need for frequent travelers to buy a local SIM card. The current roaming bundles will be revamped to introduce six new roaming packs with daily, weekly, monthly options to suit different travel needs of the customers. Users can especially enjoy the best call clarity and peace of mind abroad when making outgoing voice calls. The new roaming bundles will range from AED 35 to AED 1000 with capacities reaching up to 1000 minutes and 10 GB. Khaled El Khouly, Chief Consumer Officer, Etisalat, said: "The revamp of our roaming packages is in line with our long-term strategy of constantly innovating and making the change to meet our customers' requirements. Our

new data and voice roaming packs are the best way to stay connected abroad, offering our consumers more flexibility and a great variety of affordable options tailored to their needs without the fear of bill shock as most of our packs cover voice and data services." The Daily Data Plan offers a 500MB of data allowance for as low as AED35, while the Daily Combo Plan provides consumers with a data allowance of 1GB and 15 roaming minutes for AED 60. Daily packs will automatically renew only on days of usage. The Weekly Combo Pack (voice and data), which costs AED 250, offers a data allowance of 1GB and 30 roaming minutes. Weekly pack comes as 'one-time' and will not auto-renew with the

option to purchase more than one pack at the same time. The Economy Class pack offers a data allowance of 2GB and 60 roaming minutes for AED 350; Business Class with 5GB data and 500 roaming minutes for AED600; and First Class with 10GB and 1,000 roaming minutes for AED 1,000. All three packs are valid for one month as a 'one-time' and will not auto-renew with the option to purchase more than one pack at the same time. Data and outgoing voice can be used with preferred roaming partners, while incoming voice can be used globally excluding satellite, maritime, and flight operators. The packs can be used to make calls to the UAE and eligible countries.

Vodafone Australia's Application for Judicial Review of Roaming Inquiry Dismissed

Australia's Federal Court has dismissed an application made by Vodafone Hutchison Australia (VHA) which sought a judicial review of the Australian Competition and Consumer Commission's (ACCC's) conduct in holding a public inquiry and making a draft decision not to declare a domestic mobile roaming service. Previously, in May 2017 the regulator had published a draft decision in which it said it had found insufficient evidence that the declaration of a wholesale domestic mobile roaming service would promote the long-term interests of end users. Just a month later, however, VHA applied to the Federal Court seeking court orders to quash the ACCC's draft decision and restrain the regulator from proceeding

with the inquiry on the basis of the draft decision. Nonetheless, the ACCC opted to proceed with its public inquiry while responding to VHA's application for judicial review, and in October 2017 it released its final report into whether to declare a domestic mobile roaming service, concluding there still was not enough evidence that declaration would benefit consumers. It did however identify a range of measures in its accompanying 'Measures to address regional mobile issues paper' that could help to improve inadequate mobile phone coverage and poor quality of service in regional Australia. Now, in confirming the matter had been dismissed by the Federal Court, ACCC chairman Rod Sims

noted: 'The inquiry process is, by its very nature, a broad and flexible tool. It enables the ACCC to approach problems with an open mind and provides ample opportunity for all relevant viewpoints to be shared and given a considered hearing … It is important that the ACCC is able to thoroughly consider issues and views during the public inquiry process, especially where the ACCC is deciding whether or not to regulate a service … The decision by the Court in dismissing Vodafone's judicial review application validates the appropriateness of the ACCC's approach to conducting public inquiries of this nature.'

OSIPTEL Proposes Symmetrical MTRs from 2018

Peru's Supervisory Agency for Private Investment in Telecommunications (OSIPTEL) is planning to introduce a symmetrical mobile termination rate (MTR) of USD0.00659 (excluding general sales tax [GST]) from 2018. Further, the regulator is recommending that the tariff – 'the amounts of which will be adjusted according to the evolution of profits and productive efficiencies associated with the demand for the mobile service in Peru' – comes into effect on 1 January and is valid until 31 December, TeleGeography notes that Osiptel introduced revised MTRs in April 2015, setting a charge of USD0.0176 per minute for calls to Movistar or Claro. For Entel and Bitel, Osiptel set a fee of USD0.03250 per minute, gradually reducing to USD0.02010 by December 2017. The regulator noted that Claro and Entel have both welcomed the proposal, while market leader Movistar considered that the new rate would leave Peru below the international average.

DIGI CZ Inks Wholesale Deal to Offer High Speed Internet via CETIN

DIGI CZ, the Czech company owned by Lama Energy Group which offers satellite-based TV and internet services and mobile plans via MVNO LAMA Mobile, has signed a deal with the country's recently spun-off infrastructure business provider Ceska telekomunikacni infrastruktura (CETIN) to offer broadband internet coverage across virtually the entire territory of the Czech Republic. As a result of the deal, DIGI CZ is launching four standard tariff plans with speeds of 20Mbps, 50Mbps or 100Mbps, or up to 250Mbps in selected locations, and to encourage take-up is offering anyone taking one of its internet plans access to its DIGI TV START plan (including 23 TV channels) at a discounted rate. The firm says that the tie-up with CETIN affords it access to the largest fixed communications network in the Czech Republic, and access to an optical network that covers 85% of households with peak download speeds of up to 250Mbps. DIGI director Vladimír Rusnak says his firm sees a 'great synergy' between high-quality internet connectivity and its suite of 'fully-featured internet-based TV services'. DIGI's Internet 20 plan comprises 20Mbps/2Mbps (down'uplink) and costs CZK499 (USD22.90) a month, while the START TV package is currently offered at CZK149 a month under its launch promotion. Meanwhile, Internet 50 offers speeds of 50Mbps/5Mbps priced at CZK549 per month, Internet 100 includes 100Mbps/10Mbps (CZK649), and Internet 250 has the premium 250Mbps/25Mbps connection and costs CZK699.

ARCEP Outlines Regulatory Framework for Orange's Fixed Networks Until 2020

French telecoms regulator ARCEP has adopted a number of decisions aimed at ensuring competition in the fixed markets for the period 2017-2020, including allowing alternative operators better access to Orange France's infrastructure. The purpose of these draft decisions is to define the asymmetric regulation (i.e. which applies only to the SMP operator Orange) for the three broadband and superfast broadband markets, namely: wholesale local access provided at a fixed location (Market 3a); wholesale central access provided at a fixed location for mass-market products (Market 3b); and wholesale high-quality access provided at a fixed location (Market 4). The ARCEP said that the changes to the regulatory framework will enable more fluid rollout processes thanks to a more streamlined civil engineering offer from Orange, in addition to making alternative operators more autonomous and improving the indicators used to monitor quality of service. By eliciting the involvement of every operator, the regulator hopes to maximize the sector's investment and marketing capabilities, and thereby accelerate broadband subscribers' migration to superfast access plans.

CNMC proposes to slash MTRs by 40% by 2020

Spain's National Commission for Markets and Competition (CNMC) has issued a proposal which will see mobile termination rates (MTRs) slashed from EUR0.0109 (USD0.0130) per minute to EUR0.0064 per minute by January 1, 2020. As per the 'glide path' set out by the regulator, MTRs will decrease to EUR0.0070 in 2018 – equivalent to an immediate reduction of 36%, before dropping to EUR0.0066 in 2019, and then EUR0.0064 in 2020. All mobile network operators and Full MVNOs must offer the MTRs, the watchdog notes. Calls originating outside the European Economic Area (EEA) will be excluded from the price regulation, however.

Tanzania Proposes Steady Fall in Voice Termination Rates

The Tanzania Communications Regulatory Authority (TCRA) is set to hold a public hearing with industry stakeholders to discuss proposed changes to interconnection rates. The current rate of TZS26.96 (USD0.01) per minute came into force on January 1, 2017 and is set to expire on 31 December, ending a glide path for steadily decreasing rates that began on March 1, 2013. The regulator has invited stakeholders to attend a meeting on December 12 to discuss a new glide path for cost-based voice call termination rates, which have been proposed as follows: TZS15.6 per minute from January 1, 2018; TZS10.4 from January 1, 2019; TZS5.2 from January 1, 2020; TZS2.6 from January 1, 2021; and finally falling to TZS2.0 on January 1, 2022.

Three UK Axes Roaming Charges in 11 Additional Destinations

Mobile operator Three UK has expanded the availability of their 'Feel At Home' service (i.e. no extra charges while roaming around other countries) to a further 11 destinations including Chile, Colombia and Costa Rica among others. A total of 71 destinations are now covered. The full list of new destinations includes Chile, Colombia and Costa Rica, El Salvador, Guatemala, Nicaragua, Panama, Peru, Uruguay, Vietnam and Mayotte. Dave Dyson, CEO of Three UK, said, "My ambition is to free our customers and offer 100% free roaming worldwide, and we will continue to abolish unfair roaming charges until we achieve this … we have also committed to no changes to roaming on Three following Brexit." However it's worth remembering that you can only roam at no extra cost up to the level of your domestic allowance and there remain some restrictions for 3G or 4G data usage. For example, on 'Feel at Home' in Europe any usage above 12GB (9GB on Pay as you Go) is subject to a surcharge of up to 0.78p/MB (slightly less in a few countries). Likewise for 'Feel At Home Around the World' you can't use more than 12GB of your data allowance (9GB on PAYG), while with all-you-can-eat texts you can send up to 5,000 texts and if you've got 3,000+ minutes included in your allowance then you can use up to 3,000 minutes max.

OFCOM Proposes Restriction on Geographic Variation of FTTC Wholesale Charges

OFCOM has launched a consultation setting out proposals under which fixed line incumbent BT would be prevented from targeting reduced wholesale charges in areas where rivals are rolling out new ultrafast networks. Carrying out the consultation as part of its wider Wholesale Local Access (WLA) market review, the regulator said it was examining this specific matter after respondents to an earlier consultation had raised concerns that BT could seek to prevent or reduce the competitive rollout of new ultrafast networks by reducing its wholesale prices in the areas where such infrastructure is rolled out by alternative operators. Ofcom argues that there is indeed 'cause for concern' in this respect, suggesting such behavior could weaken the business case for the deployment of new networks, and has proposed the introduction of a new clause in the draft significant market power (SMP) conditions. This, it noted, would specify that targeted discounting would amount to 'undue discrimination', and as such would impose a restriction on BT's ability to vary wholesale rental charges in its fiber-to-the-cabinet (FTTC) footprint between different areas. A deadline of January 12, 2018 has been set for submissions from stakeholders regarding the matter, while Ofcom has said it then expects to publish a final decision in a statement in 'early 2018', with any new measures taking effect on April 1 that year.

## Ukrainian Regulator Proposes to Drop VAT on Roaming Services

Ukrainian national telecommunications regulator NKRZI has introduced a proposal to stop charging VAT on mobile roaming services, reports BizLigaNet. The watchdog presented a draft legal amendment on the issue. Mobile operator Vodafone Ukraine earlier said that ending VAT on roaming would help operators to increase investments in 3G and LTE networks.

ntel, 9mobile Announce National Roaming Trial

9mobile, Nigeria's fourth largest mobile network operator (MNO) by subscribers, will conduct a national roaming field trial with cellco ntel, reports The Independent. Both operators have garnered the approval of the Nigerian Communications Commission (NCC) to test national roaming over a period of two months. The trial will enable ntel customers to make calls on 9mobile's network using any 2G or 3G handset, with ntel CEO Ernest Akinlola adding: 'A full national roaming agreement with 9mobile would provide our growing customer base with a seamless service over 4G LTE superfast data and voice clarity, as well as ubiquitous 3G and 2G coverage nationwide.' The roaming test is believed to have started this week.
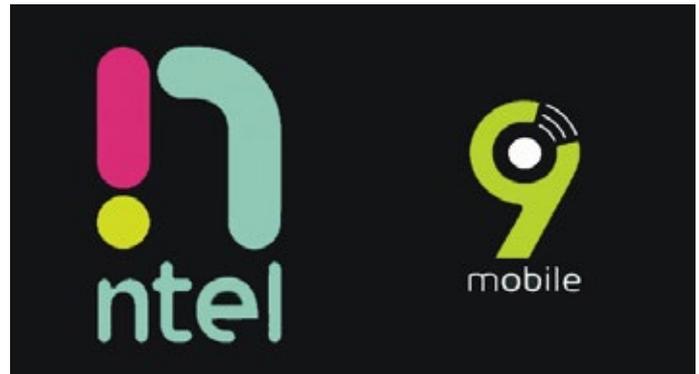
CNMC proposes to slash MTRs by 40% by 2020

Spain's National Commission for Markets and Competition (CNMC) has issued a proposal which will see mobile termination rates (MTRs) slashed from EUR0.0109 (USD0.0130) per minute to EUR0.0064 per minute by January 1, 2020. As per the 'glide path' set out by the regulator, MTRs will decrease to EUR0.0070 in 2018 – equivalent to an immediate reduction of 36%, before dropping to EUR0.0066 in 2019, and then EUR0.0064 in 2020. All mobile network operators and Full MVNOs must offer the MTRs, the watchdog notes. Calls originating outside the European Economic Area (EEA) will be excluded from the price regulation, however.

Nkom Confirms MTR Reduction Plans with Final Decision

Having sent a draft decision regarding proposed mobile termination rates (MTRs) to the EFTA Surveillance Authority (ESA) last month, Norwegian telecoms regulator the National Communications Authority (Nkom) has now issued a final ruling on the matter. Confirming its plans to reduce MTRS via press release, the Nkom noted that with the current maximum MTR set at NOK0.065 (USD0.00794), this will drop to NOK0.054 from March 1, 2018, before falling further, to NOK0.043 from January 1, 2019 and NOK0.032 from January 1, 2020. A total of eight operators are affected by the ruling, with those being: mobile network operators (MNOs) Telenor Norge, Telia Norge and ice.net; MVNOs Get, Lycamobile, Phonero (now owned by Telia) and TDC; and M2M/IoT focused Com4.

Niger Scraps International Traffic Tax

The government of Niger has voted to abolish the country's tax on incoming international traffic (Taxe sur la Terminaison du Trafic International Entrant, TATTIE) under the Finance Act 2018, reports the BBC. In return for scrapping the tax, which contributes around XOF20 billion (USD36.2 million) to the state treasury annually, the nation's telecoms operators have committed to make significant investments in improving coverage and service quality, according to Minister of Finance Hassoumi Massoudou.

Spain Approves Over 40% Cut in Mobile Termination Rates

Spain's communications watchdog CNMC has approved its proposal to drastically cut wholesale mobile rates charged by MNOs and full MVNOs to rival operators to terminate calls on their networks. The regulator earlier this year proposed slashing rates from 1.09 to 0.70 eurocents a minute in 2018 and then to 0.66 eurocents in 2019 and to 0.64 eurocents from January 1, 2020, over 40 percent less than the current rate.

ARTICLE

What's Next for Cybersecurity in 2018?

We live in a world that is networked together, where companies rely on networked systems and their data is stored in the cloud. The year 2018 will bring more connectivity, digital transformation initiatives, and data to companies, along with a number of new cybersecurity threats and landscape changes making cybersecurity one of the most crucial issues that need to be addressed in the present scenario.

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Let's just take a quick look to what we witnessed in 2017. This year incidents like WannaCry and Netya illustrate, our adversaries are becoming more and more creative in how they architect their attacks. But in the end, it's more about who has not been breached vs who is the latest. The world of cybersecurity witnessed changes frequently with security experts trying to gain know-how about what is happening and how they can mitigate it. The universal fact is that we have to accept that we can't protect everything, but we can find a way to control what matters the most.

2018 will be a year where security will become part of the fabric in how we work. Below are my cybersecurity predictions that I believe will continue to impact the technology industry in 2018.

1. Shift in focus from protection to prevention
An ounce of prevention is worth a pound of cure, so the saying goes. Historically IT organizations focused heavily on perimeter network security to protect their networks from cyberattacks. Protection at the perimeter edge works well for data moving toward the protected assets. However, recent breaches have shown that perimeter security alone isn't sufficient to combat advanced persistent threats. By

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Cisco

focusing on more proactive and offensive approaches, rather than strictly defensive, that help detect and respond to possible threats rather than react, it is possible to stop threats before they expose the organization to risk. Your security setup will need to focus on detection, response, and remediation. That's where the cybersecurity fight is today. In the future it will most likely move to prediction of what's coming before anything happens.

It's only a matter of time before every house and company is connected through the Internet of Things (IoT). We predict that as many as 1 million new connections per hour will be added to the internet by 2020 expanding the attack surface and making IoT vulnerabilities more critical and more dangerous.

2. More IoT attacks will be motivated by financial gain than chaos

It's only a matter of time before every house and company is connected through the Internet of Things (IoT). We predict that as many as 1 million new connections per hour will be added to the internet by 2020 expanding the attack surface and making IoT vulnerabilities more critical and more dangerous. IoT will move from being seen as a massive security risk in the enterprise, to a critical part of an Enterprise's security posture. To meet the security challenges of the IoT—an attack surface that is both growing rapidly and becoming increasingly difficult to monitor and manage, a proactive and dynamic approach to security, and a layered defense strategy, are the keys to protecting IoT devices from infection and attack—or at least, mitigating the impact when some are inevitably compromised by adversaries.

3. Continued growth in the use of ransomware and cyber-extortion tools

Unfortunately, ransomware attacks will almost certainly become more pervasive and varied during 2018. Some attacks will adhere to the brute-force model of infect, lock and extort, while others will be more sophisticated. Evolutions in ransomware, such as the growth of Ransomware-as-a-Service, will make it easier for criminals, regardless of skill set, to carry out these attacks. It turns out that ransomware generated a lot of cash for criminals, an estimated US$1 billion in 2016. In the future, ransomware will not merely target individual users, but also target entire networks. Given that ransomware can penetrate organizations in multiple ways, reducing the risk of ransomware infections requires a portfolio-based approach, rather than a single product. Often, victims of ransomware choose to pay the ransom, because they have no other means by which to restore their systems and data. Don't pay the ransom. Create strong plans for system and data recovery as soon as possible, including backing up all systems daily.

4. Many enterprises will give priority to cloud security

More applications and servers are moving to the cloud to take advantage of cost savings, scalability, and accessibility. As a result of this, cloud environments will be a potential target of security breaches. Cloud is a journey and cloud security must be a driver, not an afterthought. According to the Cisco 2017 Midyear Cybersecurity Report hackers recognise that they can infiltrate connected systems faster by breaching cloud systems and we expect more problems related to cloud security arise in 2018. Cloud computing security is best executed in a phased approach matching the value of the cloud workload to the bad guys' motivation. When it comes to cloud, security experts will need to decide who they can trust and who they can't and enterprises will need to develop security guidelines for private and public cloud use and utilize a cloud decision model to apply limitations to cloud risks.

5. Increased automation in cybersecurity response

Humans are incapable of keeping up with the sheer volume of incoming threats, but their ability to make quick and highly-impactful decisions to manually address such an attack is equally inefficient. As our industry faces a talent crisis, automation, machine learning and AI will be critical in ensuring protection, becoming a powerful and effective component of cyber security

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incident response. Attaining full visibility into networks is key to stopping hackers, or machines, in their tracks and machine learning can help here by understanding the behaviour of devices, including IoT devices, on the network and identifying 'soft spots' on the network that are just waiting to be breached. In 2018 machine learning and artificial intelligence will undoubtedly be integral to the future the cybersecurity landscape.

The bottom line is that there is no silver bullet. We are facing a new frontier of innovation and can only seize the opportunity if security capabilities are built to support new ventures. We need more trained professionals, as well as smarter tools that make cybersecurity more effective – for both businesses and their consumers. Cybersecurity is our shared responsibility. Because we all have a say in our business and technology, we must also view security as an inherently essential part of our organization's purpose and strategy.

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TECHNOLOGY NEWS

Natural G.C., Pulse Supply, TelcoBrides Work to Restore Wired Connections in Puerto Rico

Although wireless technologies like Google's Alphabet X entity Project Loon have received significant attention in their efforts to restore telecommunication services in Puerto Rico following the devastating hurricane there, new wired technologies are also being deployed in an effort to connect residents. Specifically, Natural G.C., Pulse Supply, and TelcoBrides issued a press release this week detailing their work to use solar power and a TDM-to-SIP interconnection technology to help restore service "for thousands of Puerto Ricans." "The solution provided by Pulse Supply using TelcoBridges' TMG800 addressed the SS7 interconnection issues that we faced prior to the hurricane," said Natural G.C.'s Crucito Marrero in the release. "The connection came up on the first day and it has been up ever since. We're continuing to collaborate together to maintain, and to extend the quality of voice and

data services across all of Puerto Rico." Natural G.C. provides wireless and wired voice, data and video transmission services throughout Puerto Rico. The hurricane's high winds destroyed most of the aboveground landline infrastructure, the company said. And in response, Natural G.C. said it used solar power to get its systems back online, and then it worked with Pulse Supply to deploy a TelcoBrides media gateway in its network to interconnect with the island's incumbent carrier using the SS7 protocol. "The solution provided by Pulse Supply allows Natural G.C. to cost-effectively perform TDM-to-SIP interconnections with other carriers throughout Puerto Rico, and the Tmedia gateways add capacity while also making their networks more reliable," explained Gaetan Campeau, CEO of TelcoBridges, in the companies' release. Of course, the work by Natural G.C. and its partners is just one element of many in Puerto Pico's

efforts to recover from the devastation of Hurricane Maria in September. Indeed, close to a month after the hurricane, Wired reported that two of the island's 25 main central offices for wired telephone service were still down, 1,300 of 1,600 total cellular sites were down and one of the island's four fiber-optic providers were down. Not surprisingly, many Puerto Ricans initially turned to wireless technology to regain their communications. And in response, Google's Alphabet X entity Project Loon worked with various operators to quickly launch balloons offering wireless services across the country. In early November, Loon announced it was delivering basic internet service to more than 100,000 people in Puerto Rico, up from the last reported figure of 10,000. As of December 13, the FCC's status report on Hurricane Maria showed that 17.6% of cell sites were still out of service, down from 22.1% on December 11.

Global Mobile Industry Set to Start Full-Scale Development of 5G NR

3GPP TSG RAN Plenary Meeting in Lisbon successfully completed the first implementable 5G NR specification. Furthermore, a 5G development covering global mobile industry. Global Mobile Industry Set to Start Full-Scale Development of 5G NR. 3GPP said in a tweet: NSA 5G NR specs were approved today at RAN#78. Balazs Bertenyi, RAN chair, called it 'an impressive achievement in a remarkably short time, with credit due particularly to the working groups. According to the press release, which occurred during Radio Access Network (RAN) meeting 78 in Lisbon, Portugal — Huawei, Ericsson, Intel, Nokia, Samsung, AT&T, BT, China Mobile, China Telecom, China Unicom, Deutsche Telekom, Fujitsu, KT Corporation, LG Electronics, LG Uplus, MediaTek, NEC Corporation, NTT DoCoMo, Orange, Qualcomm, SK Telecom, Sony Mobile Communications, Sprint, TIM, Telefonica, Telia Company, T-Mobile USA, Verizon, Vodafone, and

ZTE announced that the global mobile industry can begin the full-scale development of 5G NR including large-scale trials and commercial deployment. The 3GPP TSG RAN Plenary Meeting in Lisbon successfully completed the first implementable 5G New Radio (NR)

specification. This standard completion is an essential milestone to enable cost-effective and full-scale development of 5G NR, which will greatly enhance the capabilities of 3GPP systems, as well as facilitate the creation of vertical market opportunities.

Operators Already Testing Landmark 5G Standard

Industry leaders hailed the release of the first formal 5G standard as a milestone which sets the stage for the global mobile industry to begin full-scale deployment of the next-generation technology. Major operators from China, Europe, Asia Pacific and the US, along with key vendors and consumer electronics companies, said the release of the 5G New Radio (NR) specification for non-standalone (NSA) operation enables full scale development of the technology and associated vertical market business cases to begin in earnest. In a joint statement, Zhengmao Li, EVP of China Mobile Group noted the initial standard "completes the common part of NSA and SA, which lay a solid foundation for a global unified 5G system" with worldwide market scale. Hank Kafka, VP of Access Architecture and Analytics at AT&T, agreed, noting the "milestone enables the next phase of equipment availability and movement to interoperability testing".

Trials

Operators and vendors swiftly announced such testing, with a group of 11 detailing completion of the first multi-vendor trials using the NR standard AT&T, NTT Docomo, Orange, SK Telecom, Sprint, Telstra, T-Mobile US, Verizon and Vodafone Group conducted live demonstrations of sub-6GHz and end-to-end mmWave 5G NR systems using pre-commercial Ericsson base stations and Qualcomm's 5G NR UE prototypes. OTA interoperability tests were conducted on lower layer data connections operating in the 3.5GHz and 28GHz bands, both of

which are included in the new specification, and the tests also complied with 3GPP's 5G NR transmission specifications related to use of scalable OFDM waveforms, implementation of a slot-based frame structure, control and data channel support for massive MIMO and mmWave, and new channel codecs. While the tests were conducted at Ericsson and Qualcomm laboratories in Sweden and the US, the companies said they pave the way for operators to conduct live evaluations on their own networks. In a joint statement, Qualcomm EVP Cristiano Amon said the 3GPP specification and trials are important steps toward "the launch of standard-compliant commercial networks and devices starting in 2019". Ericsson EVP and head of Business Area Networks, Fredrik Jejdling, noted the specification and associated trials are the culmination of "years of researching and developing 5G technology". Test partners agreed the trials were a "significant" step on the road toward 5G commercialization. Luke Ibbetson, Vodafone's head of group R&D, noted the multi-vendor demonstration "paves the way for Vodafone to trial commercial grade equipment in the coming year." Similarly, AT&T's SVP of wireless network architecture design Marachel Knight said the standards-based interoperability testing "helps speed up development of 5G devices and hardware" and sets the stage for the launch of standards based services "as soon as the end of 2018."

Release 15

The 5G NR specifications for NSA operation are included in the 3GPP's Release 15 and cover both fixed and mobile applications. A key element in kick-starting the testing process is the standard enables operators to add a 5G carrier to existing LTE network architecture. Lorenzo Casaccia, Qualcomm's VP of technical standards and the company's lead for 3GPP technology standards, noted in a blog post the physical layer specifications (the air interface and radio specifications) are common to both NSA and standalone (SA) 5G NR. The remaining specifications for SA operation, which will extend full user and control plane capabilities for 5G NR, are expected to be completed in June 2018. In addition to the new radio transmission technologies mentioned above, the NSA specification also laid out key 5G bands including 617MHz to 698MHz (Band 71), AWS (Band 66), 2.5GHz, 3.3GHz to 4.3GHz, 4.4GHz to 4.99GHz, 24.25GHz to 29.5GHz and 37GHz to 40GHz.
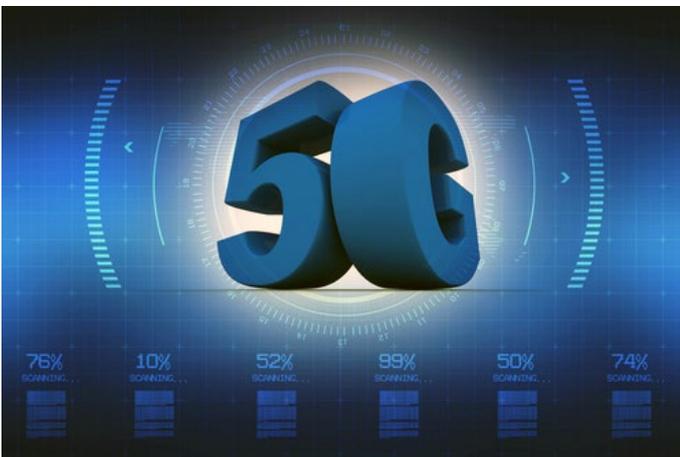
Huawei, NTT DOCOMO Report Success in 39GHz mmWave Trials

Japan's leading mobile operator by subscribers, NTT DOCOMO, and China's Huawei have reported the successful completion of a field trial of 5G mobile technology using the 39GHz Millimeter Wave (mmWave) band. In the trials, which were carried out in the commercial district of Yokahama, the pair reported achieving peak download data speeds of over 2Gbps on a test vehicle with user equipment (UE) equivalent to a mobile phone, while driving at speeds over 20km per hour. 'Long-distance transmission over 39GHz mmWave will enable 5G network deployments in a large scale. It opens up the new stage of the 39GHz mmWave technology and will deliver an ultra-fast experience with 5G data speed, said Takehiro Nakamura, Vice President and Managing Director of 5G Laboratory at NTT DOCOMO.

AT&T Labs Wants to Expand 5G Tests to 37, 39 GHz Bands in Several Markets

AT&T Labs is already testing base stations and antennas in the 28 GHz band in several locations, and now it wants to expand those tests to the 37 and 39 GHz bands. The test markets include Waco, Texas; Kalamazoo, Michigan; and South Bend, Indiana. The operator was granted FCC permission in August to conduct the 28 GHz tests through August 2019, and it wants to add the additional bands through the remainder of the license term. In its application materials with the FCC, AT&T said tests performed under this experimental license will provide information for optimizing system parameters being discussed in 5G standard activities and provide data on coverage, capacity, latency and other key performance indices. "Applicant will use this data to study potential designs for its 5G systems, contribute to 3GPP

5G standards development, and gain insight into customer perception and use patterns," AT&T Labs said. AT&T announced in August that it would be expanding its fixed wireless 5G trials to business and residential customers in Waco, Kalamazoo and South Bend by the end of this year. Already in Austin, Texas, it reported seeing speeds up to 1 Gigabit per second and latency rates well under 10 milliseconds. Universities, hospitals, churches, restaurants and other small businesses have been among those invited to participate in trials; in a car wash business in Austin, for instance, the owner boasted about giving customers the chance to trial 5G in the waiting room. AT&T said the channel bandwidth in its 37 and 39 GHz trials will be multiples of 100 MHz, up to a maximum of 800 MHz, using a Time Division Duplex scheme for

uplink and downlink transmission. The air interface protocol will be vendor-specific prototypes based on LTE-Advanced protocols as well as the required improvements and modifications for the 5G system. Transmissions will include common multimedia data as well as high-speed internet access for on-demand video and online gaming. Earlier this year, AT&T quietly acquired a company called FiberTower, which has spectrum in the 39 GHz band, but Verizon won a bidding war for Straight Path Communications, which covers the entire nation with 39 GHz spectrum. Verizon also closed on its acquisition of XO Communications earlier in the year, winning the right to lease XO's 102 LMDS licenses in the 28 GHz and 39 GHz bands.

Japan's KDDI Picks Gilat's Satellite-Based LTE Backhaul Solution

Gilat Satellite Networks has announced that Japanese mobile network operator (MNO) KDDI (au) has selected Gilat's satellite-based LTE cellular backhaul solution to extend its reach and resilience with high speed data and high-quality VoLTE throughout Japan. The vendor will deploy its backhaul solution in fixed sites as well as on deployable vehicles

for emergency response – e.g. cellular on wheels (COW), which it says leverages Gilat's 'patented LTE backhaul solution and leading mobility features to support continuous service for public safety'. Hundreds of VSATs will be deployed across Japan as a result of the deal. KDDI spokesperson Nobuyuki Kawai said the Gilat-supplied solution will enable the

cellco to deliver a 'superior customer experience' noting it will blanket 'islands and the metro-edge' areas and serve tourists visiting national parks and mountainous areas. 'Gilat's technology will be used to extend our network reach as well as a basis for our disaster recovery capabilities,' Kawai added.

Nokia: Global Internet Traffic to Double in Capacity

Global broadband traffic is set to double in capacity in the coming years, as UHD video streaming and big data from the Internet of Things (IoT) drives consumption, according to Nokia's CEO for UK and Ireland, Cormac Whelan. Speaking at the Connected Ireland event in Dublin on Tuesday, Whelan highlighted the sheer scale of the challenge facing network architects. "We are the zettabyte generation. What is a zettabyte? If expressed in storage, it is enough information to fill about 1000 datacenters, which would cover an area equivalent to 20% of Manhattan,"

he said. "We're expecting globally that traffic will more than double and will reach 2 zettabytes per year in two years' time, an increase of fivefold over the past five years. Global Internet traffic will be equivalent to 66 times the volume of the entire Internet in 2005," he added. Whelan said that IP video traffic should account for 80% of all IP traffic, within 3 years. "It would take a single person more than 5 million years to watch the amount of video that will cross global IP networks each month. Of course, this content will rely on broadband for delivery to homes and mobile devices," he said. Whelan

said that in order to cope with the sheer scale of traffic operators will be dealing with, network operators would need to utilize a variety of strategies to reach their customers. "Another convention was that fiber was the only way we could deliver ultra-fast broadband but we can now see 500 m/bits to the home over existing phone lines. To put that into context, HD streaming is about 5 m/bits and 4K ULTRA-HD is about 25 m/bits. So, 500M/bit broadband equates to 100 HD channels all streaming into your house, at once. Of course 5G can achieve similar speeds, as we'll see, later on," he said

Hong Kong Expects Commercial 5G in 2020

The government of Hong Kong says it is expecting the territory to be among the world's earliest adopters of 5G mobile technology in 2020. A report from the South China Morning Post cites IT sector legislator Charles Mok as saying that, once the 5G standard is formalized by the ITU in 2019, work will be carried out to upgrade the territory's wireless networks ready for a launch the following year. Although some local cellcos have criticized the telecoms regulator OFCA for not doing enough to promote the development of 5G by releasing further spectrum prior to 2019, authorities say they are awaiting the formal standardization of 5G before making a decision on which frequencies to offer to operators.

30 Billion Connected Devices Worldwide by 2023

There will be an estimated 30 billion connected devices by the year 2023, with 20 billion of those being connected to the Internet of Things (IoT), according to a recently published industry report. The Ericsson Mobility Report suggests that connected IoT devices will grow at a compound annual growth rate (CAGR) of 19%, as the declining price of IoT devices and sensors fuels growth in the sector. The report also suggests that there will be a sharp increase in the number of IoT devices using cellular connections. The number is set to increase from 0.5 billion in 2017, to 1.8 billion by 2023. The advent of 5G services will play a key role in facilitating this. "5G will arrive in 2019 and serve the market for 20 years thereafter. It needs to offer more than just higher speeds. 5G is not just about connecting people, it is about enabling the Internet of Things," Rahim Tafazolli from the University of Surrey told members of the press at a recent event in London. The roll out of 5G will be crucial to the evolution of the IoT, allowing for the implementation of new and more ambitious services. "5G will provide mechanisms for rapid and cost-effective introduction and provisioning of new IoT services. Based on technologies like Cat-M1 and NB-IoT, a growing number of cellular IoT networks are being deployed, with more than 20 networks now commercially launched across several regions," read the Ericsson Mobility Report. The report states that global 5G coverage will hit 20% by the year 2023.

Connected devices (billion)
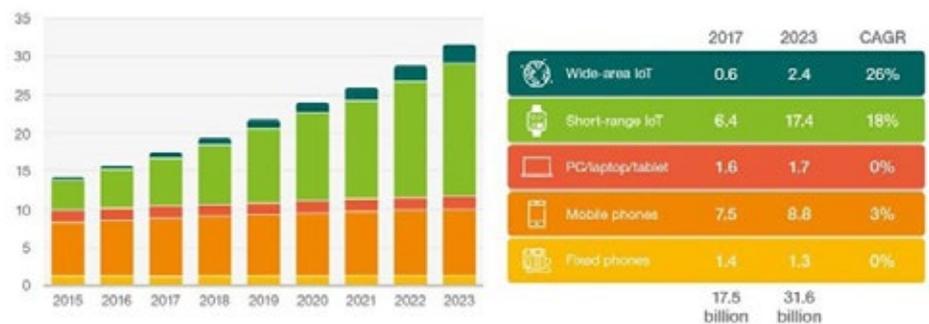
Ericsson Mobility Report November 2017

O2 Czech Republic Paves Way to 5G with WTTx and 2.6GHz Massive MIMO Trials

Incumbent operator O2 Czech Republic has announced that, as part of its next step toward 5G, it is conducting trials of two new technologies – wireless-to-the-x (WTTx) and 2.6GHz TDD Massive MIMO – in a 'live traffic' environment. Claiming a first for the country, O2 CR is deploying 2.6GHz TDD Massive MIMO in areas with a high concentration of data users to further boost data speeds. As explained by the operator's director of operations Marek Ruzicka: '[O2 CR is] constantly growing in terms of the number of customers using mobile data, and consumption is rising sharply with our new tariffs, and this year's growth in the volume of data transferred by 94% is driven by home-based customers, including wireless … therefore, the network needs to be continually improving, using new frequency bands to increase its capacity.' Massive MIMO will initially be rolled out in high traffic areas first, Ruzicka says, noting that the new technology brings more capacity to existing frequencies, allowing for more efficient use of current allocations. Further, the O2 CR official says that having secured a block of 40MHz of 3.7GHz spectrum for CZK203 million (USD9.45 million) earlier this year, it is now using WTTx technology in a live setting as part of its 5G migration path. WTTx is a 4G and 4.5G-based broadband access solution, which uses wireless to provide 'fibre-like' broadband access speeds for residential users. WTTx claims to deliver superior network performance, low cost, fast deployment and easy maintenance. 'We want to take advantage of the spectrum we need to build new services and improve existing ones for today's customers … The development of fifth-generation networks will bring significant mobile internet acceleration to those households connected,' Ruzicka said. With O2 CR currently testing both technologies in real-time, commercial deployment is planned in 2018.

BT, Nokia Partner for 5G PoC

BT and Nokia will partner together with the University of Bristol to conduct a live 5G proof of concept (PoC) test, it emerged. The tests are aimed at gauging the viability of smart urban applications over next generation networks. The tests will take place in Bristol in March 2018. "Over the coming months the test networks will be used to explore and validate the deployment of 5G architecture that integrates existing technologies with innovations such as Massive MIMO radio access solutions, software defined networking (SDN), network slicing and edge computing node functionalities," a spokesperson for the University of Bristol told the press at a roundtable event. With initiatives like this, the U.K. has a unique opportunity to establish itself as a world leader in 5G testing, despite the country's looming exit from the European Union, claimed Nokia's CEO for the U.K. and Ireland, Cormac Whelan. Speaking at roundtable, Whelan said that recent investments in the U.K. telecoms sector

could be used to establish the country as a key destination in the testing of 5G hardware. "One of the things that the Department for Digital, Culture, Media and Sport (DCMS) has been looking to do is to make the U.K. one of the key test beds in the world for 5G development. Some of this funding that they have put in place is specifically to drive those test cases. That's why it is split across a number of different universities, a number of different vendors and a number of different operators to try and drive and prove these test cases," he explained. Whelan believes that by positioning itself at the forefront of 5G testing, the U.K. can establish itself as a hub for investment for areas such as software development, cyber security and a whole host of burgeoning industries. "I think there will be entire new industries that will be driven off of the back of this, for example: digital health, industrial robotics, automation," he said. "One of the key questions for U.K. PLC to address

is how do we make ourselves one of the centers of the world for 5G proof cases?" When asked whether Britain's forthcoming exit from the European Union would limit its ability to transform itself into an international development hub, Whelan acknowledged that there would be challenges but remained optimistic about the U.K.'s prospects. "Firstly, Brexit is an annoyance. [There is the] concern over freedom of movement for labor. We are a truly international organization and 10% of our working population here in the U.K. are EU nationals," he said. "Secondly, and this is where the DCMS funding comes into it, I wonder if maybe they see an opportunity. If you can make the U.K. the test bed/expertise/center of excellence for next generation technology and communications, it gives you that acceleration to be able to say 'we are not tied down by European legislation'. I think that's quite forward thinking of the DCMS to try and use it [Brexit] as a springboard."

Deutsche Telekom Launches NB-IoT Lab

Deutsche Telekom on Tuesday launched a new Internet of Things (IoT) lab that will develop prototype products targeted at the manufacturing, logistics and aviation sectors. The facility is based in Dortmund, and sees the German incumbent teaming up with experts at the Fraunhofer Institute for Material Flow and Logistics. Up to six scientists will work at the lab, which is also open to working with other interested companies. "Fraunhofer is providing comprehensive expertise in hardware and applications in IoT environments.

And Deutsche Telekom is providing its network expertise, together with IoT and cloud solutions, all of which are key elements for IoT-based digitization," explained Michael ten Hompel, managing director of Fraunhofer IML, in a statement. Initially the two companies will focus on identifying requirements for IoT solutions, which will form the basis for developing new hardware, software, and connectivity prototypes. These prototypes will be geared towards mass-market adoption. "We will offer companies specific benefits

by solving their problems using IoT solutions," said Anette Bronder, head of digital and security, Deutsche Telekom. "All the technologies necessary for IoT solutions are in place. Now, we need to find application areas that will offer companies real value, in both the short and long terms." Deutsche Telekom and Fraunhofer IML have opted to base their prototypes on narrowband IoT (NB-IoT), which uses licensed spectrum to carry small amounts of data over long distances, using very little power.

China Steps in 3rd Phase of 5G Tests

China has started the third phase of 5G technology research and development tests, ahead of schedule, as the country accelerates steps to gain a lead in the race toward commercializing the next-generation communication technology. The move came as China Mobile Communications Corp and Huawei Technologies Co Ltd showcased the world's smallest 5G testing terminal on

Friday, indicating that the country will pioneer the world in 5G research and development. The Ministry of Industry and Information Technology said the third phase of technical tests aims to get pre-commercial 5G products ready when the first version of 5G standards comes out in June next year. The industry regulator has called for more efforts to upgrade testing environments and a bigger push

to experiment with more 5G-enabled applications, with added focus on the integration of chips, systems and other instruments. Previously, officials said the third phase tests would not start until next year. The country had concluded the second phase of tests earlier this year, with contributions from both domestic and foreign companies such as Huawei, ZTE and Ericsson.

Verizon Plans Fixed 5G Launches in 2018

Verizon said it will launch fixed-wireless 5G service in up to five markets in 2018, starting with Sacremento, California. The US operator indicated it will roll out wireless residential broadband service in three to five markets in 2018, with the inaugural launch coming in the second half of the year. Additional markets will be announced at a later date, Verizon said. Verizon CTO Hans Vestberg called the announcement a "landmark", adding: "The targeted initial launches we are announcing today will provide a strong framework for accelerating 5G's future deployment on the global standards." The operator reported the launch will not have a material impact on its capital spending plan for 2018, noting spending levels are expected to remain consistent with the past few years. Verizon conducted trials of fixed-wireless 5G in 11 markets using 28GHz spectrum throughout 2017. At an investor conference in May, CEO Lowell McAdam reported field tests of the technology yielded "substantially more" propagation than expected. McAdam added fixed-wireless 5G would allow Verizon to expand its TV and broadband footprint at a "miniscule" cost. Verizon estimated the initial market opportunity for 5G residential broadband services to be around 30 million households. AT&T is also eyeing fixed-wireless 5G with plans to launch in late 2018. In August, AT&T expanded its trial program to include three new cities: Waco, Texas; Kalamazoo, Michigan; and South Bend, Indiana.

Telefonica, Netsia Demonstrate RAN Slicing in Madrid

Telefonica and US vendor Netsia have completed the successful integration of Netsia's Virtual LTE RAN platform into the telco's Global Network Labs facility in Madrid. The two companies have effectively reproduced a private LTE network which can be sub-divided into multiple slices which, at RAN level, can offer different performances, latencies, and radio resources to different sets of customers. Juan Carlos Garcia, Telefonica's global director of technology and architecture, commented: 'The integration of Netsia's Virtual LTE RAN platform into a commercial LTE core in our Labs is an important step forward to demonstrate that an end-to-end network slicing for 5G networks is possible, from the core to the RAN, and how it can be applied to specific service environments, like that of a virtual private LTE network.'

Telus Achieves 2Gbps Speeds in 3.5GHz Trial

Canadian operator Telus has announced that it has successfully completed a 'live-environment mobile broadband test' using 3.5GHz spectrum. The tests, which took place in suburban north-west Edmonton, achieved download speeds in excess of 2Gbps, which the telco says helps to demonstrate how important 3.5GHz spectrum is to enabling future deployments of 5G technology.

For illustration purposes only

Proving scientific predictions can take centuries of trial and error

Exploration
never stops at failure

Perseverance enables the commitment to build
the foundation for future technology

HUAWEI

EXPLORATION IN THE MIDDLE EAST:
The Next Step in a Long Tradition

Joy Tan
President of Global Media and Communications
Huawei

Since Huawei began operating in the Middle East in the early 2000s, we have been passionate advocates of ICT innovation. Through our investment in education, promotion of digitalization, and establishment centers for collaborative creation, we have pushed back the boundaries of knowledge. The Middle East has been a partner in these endeavors, providing Huawei with the resources and talent needed to turn our vision of a Better Connected World into reality. This is not surprising, given the Arab world's rich heritage of trailblazing inventions, dating back millennia. Huawei's ideals of innovation, openness and perseverance have been cornerstones of the region since the first humans learned to plant crops and write script in Mesopotamia, laying the foundation of human civilization.

Technological progress is an arduous process. Each generation chips away at the infinite block of human ignorance, struggling to uncover a nugget of truth to share with the world.

Technological progress is an arduous process. Each generation chips away at the infinite block of human ignorance, struggling to uncover a nugget of truth to share with the world. In this laborious way, since the dawn of time people have been building up a vast repository of knowledge. Without first laying the foundation of exploration in basic science, none of today's technology would be possible. And the Middle East produced one of the fundamental building blocks of modern technology: algebra.

The word algebra comes from ninth-century Persian mathematician Muammad ibn Mūsā al-Khwārizmī, who wrote a treatise entitled "Kitab al-Jabr I-Mugabala," or "The Compendious Book on Calculation by Completion and Balancing." His revolutionary insights into a mathematics based on numbers rather than shapes (geometry in the Greek tradition) transformed how scholars approached arithmetic and paved the way for modern mathematics. Like most paradigm-shifting discoveries, the idea of basing calculations on numbers seems obvious now. Yet it took the work of a Persian savant to light the path forward for

future generations of scientists and mathematicians. Isaac Newton once attributed his visionary insights to "standing on the shoulders of giants." In the case of mathematics, we are all standing on the shoulders of Muammad ibn Mūsā al-Khwārizmī.

The invention of algebra makes a good narrative, especially in a world that celebrates the lone genius. Through textbooks and fiction, we mythologize our Isaac Newtons, our Albert Einsteins, our Thomas Edisons. Yet the reality is that most innovation comes not from a single flash of genius, but as a result of long-term collaboration among experts. Huawei believes that fostering openness and cooperation is key to technological progress. When we pool our knowledge, our collective wisdom produces something greater than the sum of its parts. For this reason, Huawei has nurtured an industry ecosystem in the Middle East that is open, diverse, and dynamic, incorporating external resources and building symbiotic relationships to benefit the whole community through digitalization.

Huawei believes that fostering openness and cooperation is key to technological progress. When we pool our knowledge, our collective wisdom produces something greater than the sum of its parts.

This understanding of the need for cooperation among experts is not new in the Arab world. We can trace its roots back to the ninth century, when Fatima Al-Fihri opened the world's first university in Fez, Morocco. The tireless quest for knowledge is central to the Muslim faith, and Fatima Al-Fihri was a pious woman who wanted to create a center where scholars could share their expertise on matters as diverse as theology, logic, arithmetic, geography, and medicine. The center quickly established itself as a haven of learning and innovation, and its reputation lured scholars from far and wide. Twelve hundred years later, the university is still in operation, a symbol of Arabs' unwavering dedication to enlarging and widening the world's pool of wisdom.

Unwavering dedication is necessary in the quest for knowledge. The path to discovery is littered with flawed theorems and disproved hypotheses, and an explorer could easily be discouraged from persevering in the face of such setbacks. But failure is as commendable as success. Heroes aren't those who avoid failure, but those who extract from it the elements of success. They should be recognized for their work and encouraged to keep exploring. Failures accomplish a valuable task: by eliminating the ideas that flop, they bring us closer to finding those that will succeed.

The experiments of Abbas ibn Firnas vividly demonstrate how failure can lead to success. Firnas was a ninth-century scientist and inventor reputed to be the

The tireless quest for knowledge is central to the Muslim faith, and Fatima Al-Fihri was a pious woman who wanted to create a center where scholars could share their expertise on matters as diverse as theology, logic, arithmetic, geography, and medicine.

first human to fly. He designed a flying machine which he donned before jumping from a cliff. Witnesses said he flew a long way before a hard landing that injured his back. Firnas's winged apparatus is thought to have inspired Leonardo da Vinci's later attempts to create flying machines. His failure was a vital step on the path to creating the airplanes of today.

Innovation, openness, perseverance: each is a pillar of exploration. By steadfastly relying on these pillars, Huawei has grown from humble beginnings to become one of the world's leading ICT companies. Yet we will never grow complacent. We will keep pushing the boundaries of knowledge, and we are proud to do so with the collaboration of our Arab partners—a people whose heritage is steeped in a culture of innovation.

REGULATORY NEWS

High Court Rejects Challenges from Three and EE over Ofcom's Spectrum Auction Plans

British telecoms regulator Ofcom has won a judicial review related to its planned sale of spectrum in the 2.3GHz and 3.4GHz bands. According to Telecoms.com, the High Court ruled in the watchdog's favor after both Three UK and EE had launched legal challenges regarding the auction plans; notably, the former had argued that a proposed spectrum ownership cap had been set too low. In his ruling summary regarding the case, The Honorable Mr. Justice Green said: 'In the light of my review of the evidence I am clear that the approach taken by Ofcom was comprehensive, coherent and logical … Ofcom's findings are evidence-based and justified. To arrive at its

Decision Ofcom engaged in a detailed predictive analysis of how the market would work in the future under a series of different assumptions and scenarios. It consulted upon its economic and econometric analysis and modelling. In the Decision it sought to strike a delicate balance between protecting competition and consumers, on the one hand, and setting restrictive caps which were not disproportionate to BT/EE. The balancing exercise was sound.' In response to the development, EE confirmed it would not appeal the decision, but Three does plan to do so, with a spokesperson for the mobile network operator (MNO) cited as saying: 'We are disappointed by the initial

ruling of the court as a fairer distribution of spectrum is vital for UK consumers and the digital economy … The team at Three is committed to providing the best possible offering for our customers and we are seeking permission to challenge the ruling in the Court of Appeal urgently.'

UK Authorities Opt for Broadband USO over Voluntary Agreement with BT

The British government has confirmed that universal high speed broadband will be delivered by a regulatory Universal Service Obligation (USO), having opted to not to pursue a proposal from BT to deliver such connectivity via a voluntary agreement. In a press release the Department for Digital, Communication, Media and Sport (DCMS) said that the USO will ensure everyone in the UK has access to a service offering downlink speeds of at least 10Mbps by 2020. It added that, having launched a consultation on the design of the regulator USO earlier this year, the government now aims to set out the design for a legal right to high speed broadband in secondary legislation early next year, alongside a

detailed response to the consultation. With regards to the decision to opt for the USO in favor of BT's proposal, meanwhile, the DCMS noted that, having considered the latter it 'did not feel the proposal was strong enough … to take the regulatory USO off the table', arguing that 'only a regulatory USO offers sufficient certainty and the legal enforceability that is required to ensure high speed broadband access for the whole of the UK by 2020'. Specifically, it has claimed the regulatory approach will offer a number of advantages for consumers, including: allowing for minimum connection speeds to be increased over time as customer requirements evolve; providing for greater enforcement to help ensure premises

can get connected, especially in hard-to-reach areas; and introducing a legal requirement for high speed broadband to be provided to anyone requesting it, subject to a cost threshold (in the same way the universal service right to a landline telephone works). Commenting on the matter, UK culture secretary Karen Bradley said: 'We know how important broadband is to homes and businesses and we want everyone to benefit from a fast and reliable connection. We are grateful to BT for their proposal but have decided that only a regulatory approach will make high speed broadband a reality for everyone in the UK, regardless of where they live or work.'

Dutch Experimental DAB+ Licenses to Expire on 1 January

Dutch regulator Agentschap Telecom noted that all experimental permits for the local DAB+ layer, including all renewals, will expire on 1 January 2018.

In preparation for the distribution of local DAB+ layer, local DAB+ experiments could be performed. Since June 2016, more than thirty experimental permits

have been granted. An extension period became necessary for a number of these. By their nature, experimental permits are temporary.

3GPP Approves First 5G Specification

As expected, the 3GPP completed the specification for the non-standalone 5G New Radio (NR) earlier today at the RAN Plenary meeting in Lisbon, Portugal. The 5G NR specification is the first part of the global 5G standard. Balazs Bertenyi, chairperson of the 3GPP RAN working group, announced the news via Twitter earlier today, calling it "an impressive achievement in a remarkably short time." The release of this 5G NR standard means that chipset vendors can go ahead and design silicon based upon this standard. According to a report from Signals Research, the non-standalone architecture leverages the LTE and the NR air interfaces as well as the existing LTE core network. This configuration will likely be used for early 2019 deployments. There is a standalone version of 5G NR that the 3GPP is still working on. Standalone 5G NR will have full user and control plane capability and will use the next-gen core network architecture. This specification is expected to be finished in June 2018 as part of the 3GPP Release 15. The release of the non-standalone 5G NR spec was originally scheduled for March 2018, but that timeframe was accelerated after the 3GPP received pressure from many operators including AT&T, Sprint, Telstra, and Vodafone. Qualcomm was also very involved in the early release of the non-standalone 5G NR spec.

In a blog post, Lorenzo Casaccia, VP of technical standards at Qualcomm, said that this was an important milestone in 5G development. "For those of us that have been involved from the beginning — performing early R&D, developing prototypes, and delivering fundamental contributions to 3GPP — we understand that this milestone is no baby-step on our journey to making 5G a reality."

NCC Plans to Bridge Digital Divide Soon

The Nigerian Communications Commission (NCC) has advertised for licensing of infrastructure companies as part of its plans to actualize the National Broadband Plan and close the digital divide by making internet available, accessible and affordable. The Executive Vice Chairman of the Commission stated this in Minna the Niger State capital, recently, while presenting a paper on the importance of ICT to the growth of the economy titled Achieving A Digital-Led Growth Through Information And Communication Technology with theme Leveraging On ICT For Sustainable Economic Development. The event was organized by the budget office of

the federation for the 36 States of the federation. The Executive Secretary was represented by the Director, Policy Competition and Analysis, Mrs. Josephine Amuwa. "One of the things we are doing is to ensure that infrcos infrastructure companies are licensed. We have put up advertisements for expression of interest and we have gotten a number of people who have shown interest building, so are working on it and soon we are going to announce these licenses. With their coming in they will start to build their networks and that is how we are going to achieve the 30% by the end of the year. The digital divide cannot be breached at once so you have to do different things; the licensing, encouraging investments by making sure that investments come into the country. Those are lots of things that you do to ensure that divide is not widened. Funding has always been a challenge because you know ICT. You need a lot of funding to roll out any infrastructure. So we still encourage banks in Nigeria to support our operators and like I said we have the USB funds where we give subsidies

to operators," he stated. He said that to make internet available, accessible and affordable the Commission has to encourage competition which will lead to reduction of data tariffs. He before you can talk of competition internet has to be first all available. "One it is available; that's why we talk about competition; if there is competition, competition drives down prices. It is only when there is no accessible that the price is high but when there is competition it becomes available and the prices come down," he added. He also admitted that there were challenges to the National Broadband Plan of achieving 30 per cent broadband penetration by 2018. "Currently in Nigeria, more than 10 terabytes of telecommunications capacity exist at the landing point but is the deployment of fiber infrastructure across the country that will effectively distribute this capacity to the distribution nodes at the metropolitan areas of all regions of the country that will supply sufficient fiber capacity to the backbone," he said.

OFCOM Unveils Mobile Switching Reforms

OFCOM said it is introducing new rules to make the switching process easier after it "identified unnecessary difficulties that many consumers experience when they switch or consider switching mobile provider." Under the new rules, mobile users will be able to switch providers by sending a free SMS message, cutting out the process of speaking to a provider in order to leave. According to figures from the regulator, 38% of UK mobile switchers ay they experienced at least one major problem during the switching process, while seven in 10 said they encountered at least one difficulty. The changes, which will come into force in July, 2018, mean providers will be banned from making notice-period charges after the switch date – saving UK mobile customers

around £10m in total each year, Ofcom claims. Customers who are able to switch will be able to request a code by texting a free number, going online, or by calling their provider. They then receive the code, which they pass to their new provider when they are ready to move their number. The service, Ofcom claims, will be completed within one working day. Lindsey Fussell, Ofcom's consumer group director, said: "Too many people are put off by the hassle of switching mobile provider. Our changes will make it quicker and easier for mobile phone users to get a better deal. "Customers will control how much contact they have with their current mobile provider, preventing companies from delaying and frustrating the switching process." CK Hutchison's

UK mobile operator Three has been lobbying for changes to the switching process for several years, and said it welcomes the decision from Ofcom. However, a spokesperson for the operator claimed the regulator should have gone further. The three spokesperson said: "For more than a decade Three has been encouraging Ofcom to do more to ensure that consumers can easily switch mobile phone provider and get the best deal. "While we are pleased that there is now a simpler process, we believe that Ofcom's decision not to prevent "last ditch" deals means that the UK still lags behind its international peers in terms of consumer rights."

ARCEP Threatens to Revoke Azur's Operating License

Struggling Gabonese cellco USAN Gabon (Azur) has been warned by telecoms regulator the Regulatory Authority for Electronic Communications and Posts (ARCEP) that it could lose its operating licence due to its continued poor performance. ARCEP lists some of the difficulties that Azur has faced since it

first launched a GSM network in 2009, including negative financial results reported each year; a large debt, at around XAF42 billion (USD75.2 million) owed to various providers and the state; difficulties in implementing 3G and 4G technologies; deterioration of the quality of service and the non-payment of

staff salaries for at least the past seven months. ARCEP has stated that it has 'decided to take all necessary measures to put an end to this situation, which has a negative impact on the macroeconomic balance of the electronic communications sector in the Republic of Gabon.'

EC Vows to Protect Net Neutrality in Europe

The European Commission (EC) reaffirmed its commitment to preserving net neutrality across Europe in the wake of a US vote to repeal its regulations. In a Tweet, EC VP for the Digital Single Market Andrus Ansip (pictured) said the EC would "continue to protect net neutrality in Europe," adding the "right to access the open internet without discrimination or interference" was enshrined in EU law. Earlier in the week, Ansip wrote an editorial in Le Monde in a bid to reassure the public measures in the US would have no impact on Europe. In the article, he highlighted the economic zone's Open Internet regulation – passed in November

2015 and enforced in April 2016 – would "continue to protect all internet users" across member states. The EU is set to review the regulation by April 2019 with the EC set to conduct an initial assessment on the impact of the rules in 2018. EC representative Nathalie Vandystadt told Mobile World Live: "Net neutrality is a very important issue for protecting the right of every European to access internet content, without discrimination." "These rules are enshrined in a regulation and directly applicable in all member states. They give end-users the right to access and distribute the information, content, applications and services of

their choice and ban blocking, throttling and discrimination between content, applications and services, or categories thereof."

FCC Repeals Net Neutrality

The US Federal Communications Commission (FCC) voted 3-2 to repeal its 2015 net neutrality protections in favor of a new "light-touch" regulatory framework. Rules adopted by the commission restored classification of broadband internet access as a Title I information service and regulatory jurisdiction over internet service providers (ISPs) to the Federal Trade Commission (FTC). New transparency requirements – which force ISPs to disclose information about practices like blocking, throttling and paid prioritization of content – were also implemented as part of the measure. The vote on the repeal proposal was briefly delayed due to a security alert, albeit by only a little over ten minutes.

Opposition

Approval came despite vociferous objections from commissioners Jessica Rosenworcel and Mignon Clyburn, the latter of whom called the measure a "legally lightweight, consumer harming, corporate enabling, destroying internet freedom order". Clyburn pointed out the FTC "may not even have authority over broadband providers in the first place," and blasted the "soon-to-be toothless FCC" for "handing the keys to the internet over to a handful of multibillion dollar corporations". She warned providers now may be able to "quietly roll out" paid prioritization or similarly biased programs and prevent consumers from fighting back with non-disclosure agreements and mandatory arbitration clauses built into service agreements. She highlighted the massive public backlash and bipartisan calls from Congress to delay the vote. The commission's action despite the outcry spoke "volumes about who is being heard" at the FCC, Clyburn said. The commission's majority defended itself. Commissioner Michael O'Rielly said he reviewed substantive comments submitted in the record "with interest", but said he was "simply not persuaded that heavy-handed rules are needed to protect against hypothetical harm". O'Rielly added paid prioritization could serve to enable new technologies and mission critical use cases. "I, for one, see great value in the prioritization of telemedicine and autonomous car technology over cat videos." Chairman Ajit Pai explained "it is not the job of the government to be picking winners and losers in the internet economy," adding it is "time for the internet, once again, to be

driven by engineers, entrepreneurs and consumers, rather than lawyers, accountants and bureaucrats". Under light-touch regulation "broadband providers will have stronger incentives to build networks, especially in unserved areas, and to upgrade networks to gigabit speeds and 5G", he added.

ISP pledge

During a media call held ahead of the vote, the heads of three wired and wireless industry associations – the National Cable & Telecommunications Association (NCTA), CTIA and USTelecom – vowed to protect open internet principles in the wake of the vote. Prominent internet providers Comcast, Charter Communications and Altice USA are among NCTA's members, while CTIA counts AT&T, Verizon, Sprint and T-Mobile on its rolls. NCTA CEO Michael Powell claimed the FCC's order will not impact consumer activities in "any meaningful or measureable way", assuring users their internet experience "will not change in any significant or substantial way" in the days, weeks and years following the vote. AT&T said it does "not block websites, nor censor online content, nor throttle or degrade traffic based on the content, nor unfairly discriminate in our treatment of internet traffic". The operator stated it continues to support a legislative solution from Congress on net neutrality. Comcast issued a similar statement pledging not to create internet fast lanes and stating "customers will continue to enjoy all of the benefits of an open internet today, tomorrow, and in the future. Period." Rosenworcel hinted the net neutrality battle will continue "in the courts, in Congress, wherever we need to go to ensure that net neutrality stays the law of the land."

UK Telecoms Leaders Meet to Discuss Strategy for Fiber Networks

Senior representatives of UK telcos, along with member's of the government and Ofcom attended the meeting with European ministers. Senior leaders from Britain's top telecom's operators met with government officials and representatives of Ofcom this week to discuss strategies for investing in Britain's full fiber networks. The meeting was attended by senior representatives from BT's Openreach, Talk Talk, Sky, Vodafone and Virgin Media, as well as the UK's culture secretary, Karen Bradley, and the head of Ofcom, Sharon White. The meeting sort to identify ways to speed up the roll out fiber to the home (FTTH) services in the

UK. Britain is lagging behind its European neighbors in the roll out of FTTH services, with just 3% of Britain's being able to connect to full fiber. For the purposes of comparison, Orange alone has rolled out FTTH to 25 million people in France and Spain. The UK government has set a target of providing FTTH services to 10 million premises by 2023, but there has been much debate over who should pick up the bill. The UK government has recently created a £190 million fund, which aims to stimulate investment in fiber networks. The meeting came a week after Ofcom had called on BT to speed up its investment in the UK's full fiber

broadband networks. "Competition for fiber is growing, as will consumer demand for it. As the owner of Openreach it should act in the interest of all of its customers who rely on it, as well as its shareholders," said Sharon White, chief executive of Ofcom. Ofcom's Chief Executive, Sharon White, will be a speaker at this year's Connected Britain event, where she will be discussing the implications of underinvestment in full fiber networks on Britain's business sector. From June 19–20, 2017, the event will bring together key stakeholders in Britain's broadband infrastructure.

Antitrust Body Refuses to Give Up On USD1.48bn SMC-PLDT-Globe Deal Probe

According to GMA News, antitrust watchdog Philippine Competition Commission (PCC) has filed an eleventh-hour appeal to the Supreme Court (SC) asking to be allowed to continue a review into the PHP69 billion (USD1.48 billion) buyout of the telecoms assets of San Miguel Corp (SMC) by local telecoms giants PLDT Inc. and Globe Telecom. In a press briefing, PCC commissioner Johannes Bernabe confirmed that the appeal was filed by the PCC 'together with the Office of the Solicitor General (OSG)' on the deadline day. The Court of Appeals confirmed the legality of the joint acquisition of SMC's telecoms business in October this year. However, the antitrust watchdog disagrees with

its findings prompting its decision to file an appeal. Should the SC come down on the side of the PCC this time around, it will be able to continue reviewing the deal which the Court of Appeal 12th Division stopped last year. Globe Telecom declined to comment on the development while PLDT issued a statement saying it would 'study the petition'. According to TeleGeography's GlobalComms Databas, in May 2017 the country's de facto duopoly completed their acquisition of SMC's telecommunications assets, making their final joint payment in defiance of the Philippine antitrust body's request to wait for the courts to make a final ruling. Officials from both operators and SMC confirmed the final payment

of PHP13 billion (USD261.3 million) had been made, completing the deal to buy Vega Telecom for a total of around PHP69.1 billion that was agreed in mid-2016. 'It's done,' said SMC president Ramon S Ang in a text message, while Globe CEO Ernest Cu confirmed that his company was merely complying with last year's agreement, which covered the buyout of Vega but specifically targeted SMC's valuable but underused telco frequencies, assigned to PLDT and Globe as part of the transaction. 'We will just continue the rollout. That is what we are doing,' Cu said, referring to the ongoing aggressive rollout schedule to deploy more cell sites – including LTE-ready equipment in the coveted 700MHz band.

Colombian Government Accelerates Movistar Stake Sale Plans

The Colombian government has accelerated its plans to dispose of its 32.5% stake in Telefonica Colombia (Movistar), El Economista reports, and is now in the process of identifying a bank to manage the sale. It is understood that Telefonica Group is not interested in raising its own 67.5% stake in the operator, meaning that the government has to identify an outside investor to take its place. The stake sale was prompted

by July's COP4.8 trillion (USD1.6 billion) joint fine, which was levelled at Movistar – and rival Claro – for breaching the terms of their original 1994 licences. The two mobile operators were required to return all wireless network infrastructure to the state after a ten-year period (subsequently extended for a further ten years), but failed to do so. As the co-owner of the cellco, the government was duly obliged to participate in a capital

increase of approximately EUR1.37 billion (USD1.64 billion) to pre-pay all commitments in relation to PARAPAT, the consortium that owns the telecoms assets and manages the pension funds of the former companies that resulted in the creation of legacy operator Colombia Telecomunicaciones (ColTel, now Telefonica Colombia).

ComReg Confirms It Is Seeking to Levy EUR10m Fine on eir

Ireland's telecoms regulator the Commission for Communications Regulation (ComReg) is reportedly looking to impose a 'record' fine on eir over the telco's alleged failure to comply with obligations to allow rival providers access to its network. According to the Irish Times, the watchdog is seeking to levy a EUR9.6 million (USD11.3 million) penalty, with this figure having been made public as ComReg gave notice of its intention to join legal proceedings between eir and the government. Previously, and with a view to blocking the regulator from imposing any fine, in

October 2017 eir launched a countersuit against the government, claiming that EU regulations have been incorrectly applied, and arguing that ComReg has overstepped its remit in trying to impose civil sanctions on it. For its part, the watchdog had been seeking a declaration of non-compliance from the High Court against eir for regulatory breaches dating back to 2011. However, last month Judge Robert Haughton determined that the telco had legitimate grounds in bringing its case against the state. In the wake of that latter development, in a statement issued this week ComReg confirmed it had

successfully applied to join the 'access regulations proceedings' between eir and the government, while adding that it was keen to have the case listed in the fast-track commercial division of the High Court.

FCC's Copper Retirement Plans Face Repeal from Non-Governmental Organizations

A four-part nongovernment organization (NGO) coalition has filed an appeal against the FCC's decision in November to remove some of the obligations for operators to notify customers when they stop servicing copper lines. Public Knowledge, the Greenlining Institute, the Utility Reform Network and the National Association of State Utility Advocates filed the petition for review with the Ninth U.S. Circuit Court of Appeals and asked the court to reverse the FCC's order and restore consumer protections. In its filing (PDF) with the court, the petitioners asked the court to review paragraphs 37 to 39 of the Report and Order and paragraphs 128 to 155 of the Declaratory Ruling related to how service providers inform customers they are turning off their copper circuits. "In the relevant paragraphs of the Report and Order, the Commission eliminated the de facto retirement rule, which required incumbent local exchange carriers to provide adequate notice to affected customers when they failed to maintain copper, subloops, or the feeder portion of such loops or subloops that is the functional equivalent of removal or disabling," the NGOs said. The group's action should not be of any surprise. When the FCC voted to approve reforms in November designed to accelerate the migration of copper to fiber networks, the proposal incited a mix of praise and derision from telcos, industry groups and its own ranks. Under the proposed reforms set by the regulator, the intent is to streamline the copper retirement process. As part of its copper retirement reform proposal, the FCC eliminated the copper and subloop portion of the de facto retirement rule. Specifically, the FCC eliminated the "functional test" which required the regulator to examine the "totality of the circumstances" when evaluating whether an incumbent LEC's network change constitutes a "discontinuance, reduction, or impairment of service" under section 214 of the Communications Act. Instead, the FCC says that a service provider's tariff is sufficient for determining what "service" a carrier offers for purposes of determining whether section 214 discontinuance review is required. "The petitioners seek review of these Commission decisions on the ground that they are arbitrary, capricious, an abuse of discretion, or contrary to law pursuant to 5 U.S.C. § 706," the NGOs said, adding that "the court holds unlawful and vacate the challenged Commission decisions." At the same time, the FCC's decision has drawn praise from the large U.S. telcos like AT&T, CenturyLink, Frontier and Verizon, which have maintained longer copper and legacy retirement rules have hindered their migration to fiber and next-gen services. These service providers have continually been migrating more of their customer bases off of copper and onto fiber in various parts of their wireline networks. The new FCC's move effectively overturns the 2015 Technology Transitions Order set by former FCC Chairman Tom Wheeler. At that time, the Wheeler-led commission developed a longer 180-day period. As part of that order, the FCC proposed giving competitive carriers and businesses a six-month notice, while residential customers get three months' notice before copper facilities are shut down.

EU 5G Roadmap Promises Rollout by 2025

EU ministers have agreed a roadmap for the roll out of 5G technology across Europe. The roadmap will provide consensus over the harmonization of 5G spectrum bands and how they will be allocated to operators across Europe.During a high profile meeting in the Estonian capital of Tallinn, representatives from the EU's member states laid out plans to roll out 5G networks across Europe by 2025. "By the year 2025, we want to see the presence of 5G connectivity in large cities and along major transport routes of every European country. These 5G networks are needed both for citizens and the devices that require reliable and high-speed internet access to cope with increasingly large quantities of data," said Urve Palo, Estonian Minister for Entrepreneurship and Information Technology. Palo said that 5G was a crucial step in safeguarding the economies of Europe over the next decade. "It is no secret that a digital Europe is a priority for us, however, a digital society cannot be created without 5G networks," she said. "5G is essential to ensuring communication in the future, with billions of devices online needing to be connected at all times and regardless of location, 5G technology is able to provide users with more data volumes and guaranteed quality connections," she added. While EU Ministers are united in the need for the 5G roadmap, some analysts and industry professionals are questioning whether

enough is being done to ensure Europe devotes adequate resources to the implementation of 5G. In an exclusive interview with Total Telecom last week (conducted before the EU's 5G roadmap was announced), Ericsson's senior vice president and head of business services, Ulf Ewaldsson, said that Europe was in danger of being left behind in 5G technology development and implementation. "One issue that we have is that Europe is not very 5G orientated. People are asking "what is the business case for it?" Whereas in the US they are ready to go, the whole industry is moving. This is also true in Asia – the whole industry is moving [towards 5G]. I'm a little bit worried about European technology leadership here," he said.

TRAI Recommends Speeding up M&A Process

Sector watchdog the Telecom Regulatory Authority of India (TRAI) has published its recommendations on 'Ease of Doing Telecom Business', focusing primarily on issues related to licensing. These include: streamlining the approval process by making Standing Advisory Committee for Frequency Allocation (SACFA) clearance available through an online portal; granting Demonstration and Experimental Licenses with a maximum of 15 and 30 days, respectively, and making Experimental Licenses valid for six months initially and extending that period by a further six months. Notably, however, the regulator made several recommendations regarding the merger and acquisition (M&A) process. The TRAI suggested that the Department of Telecommunications (DoT) should submit any objections to M&A requests within a maximum of 30 days. Further,

the DoT should set out a timeline, also not exceeding 30 days, for the provision of written approval for the transfer of licenses following an agreement's endorsement by the National Company Law Tribunal (NCLT). This timeframe should be enshrined in the DoT's M&A Guidelines policy. Regarding spectrum issues resulting from mergers, the regulator recommended that operators be given one year to trade or surrender excess spectrum if a merger or acquisition would cause them to hold more than the legal upper limit. The TRAI also suggested simplifying matters by allowing spectrum trading for all access spectrum bands that have been put to auction. As previously reported by TeleGeography's CommsUpdate, prolonged delays in receiving final approvals for M&A led to the breakdown of the planned three-way merger of Reliance Communications,

Aircel and Sistema Shyam TeleServices Limited (SSTL), whilst prior to that the acquisition of Loop by Bharti Airtel was also scuppered by regulatory delays. Also of note was TRAI's recommendation that the DoT devise a 'suitable matrix' to link financial penalties to the severity of an infraction and its recurrence. Following allegations of corruption at the ministry in 2012, the DoT began to impose the maximum penalties allowed for comparatively minor infractions in an effort to demonstrate that it was not colluding with industry players. This approached proved damaging to the industry and as each violation had to be challenged in the courts. Attempts to steer the DoT towards a more rationalized structure have so far proved unsuccessful.

Hong Kong Creates 920-925 MHz Wireless IoT License

Hong Kong's Communications Authority has created a new licensing regime for the provision of wireless Internet of Things (WIoT) platforms and services using the shared frequency band of 920 – 925 MHz. Services to be authorized

under this new WIoT Licence only support automated machine to machine type data communications.

Saudis Enjoy 400 Percent More Internet Data than Global Average

Subscribers to Saudi telecommunications networks enjoy a 400 percent increase in data volume and a 200 percent increase in audio bandwidth over Internet users around the world, according to Al-Eqtisadiah newspaper. These percentages

are the outcome of a recent government study on broadband fair usage policies that is generally applied by international telecommunications companies. Telecom companies have allocated 30 gigabytes per month to their customers,

i.e., 1 GB per day, while the volume of data specified in the broadband fair usage policies in Saudi Arabia is 90 GB per month for mobile audio credits, or a daily usage rate of up to 3 GB, the study revealed. The data bandwidth is 180 GB per month, with a daily usage rate of up to 6 GB. The monthly data bandwidth allocated to subscribers of telecommunications companies in Saudi Arabia per month is huge. It allows subscribers to view the full length of 720 hours of audio bandwidth in Snapchat and 1,440 hours of data per month, or watching YouTube videos for up to 360 hours, browsing Instagram for 630 hours or 423 hours for Skype. The space allotted for data bandwidth allows viewing YouTube for up to 720 hours, or 1,260 hours for Instagram, or 846 hours for the Skype.

Twitter and 200 Other Businesses Urge US to Keep Net Neutrality Rules

Over 200 internet companies including Twitter, Reddit, Airbnb, Shutterstock, Tumblr and Vimeo have signed a letter asking the FCC to scrap its plan to end net neutrality. In a letter released on Cyber Monday, the signatories urged FCC Chairman Ajit Pai, to reverse recently announced plans last remove 2015 rules intended to ensure a free and open internet and once again give Broadband Service Providers power over what content consumers can access. "An internet without net neutrality protections would be the opposite of the open market, with a few powerful cable and phone companies picking
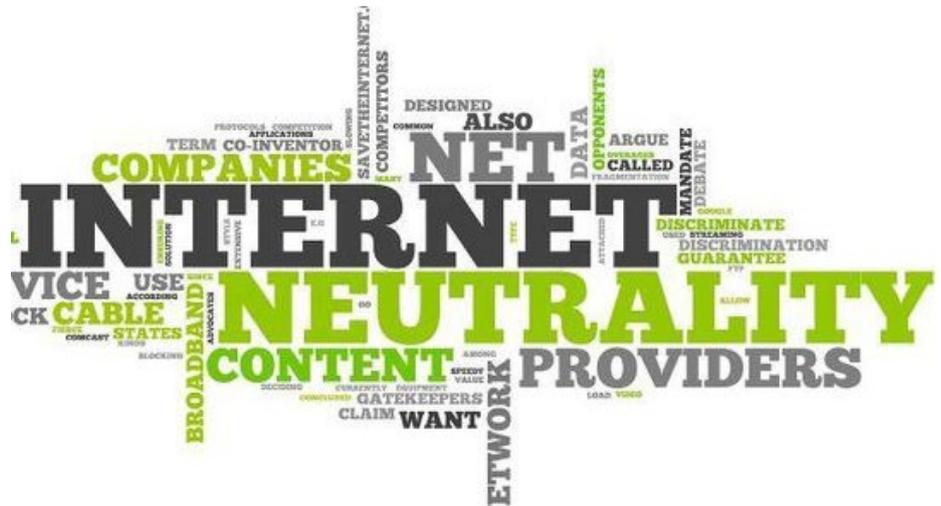
UK Government Facing £300M Mobile Refund

The UK Treasury may owe the mobile industry up to £300 million after a court upheld an operator challenge to a government-mandated license fee rise, Financial Times (FT) reported. In 2015, regulator Ofcom was asked to increase spectrum fees, which trebled the annual license fee of many operators and resulted in the industry having to cough up £200 million a year for licenses. UK operators sought a judicial review, stating Ofcom had wrongly calculated the amounts, for instance by not taking into account network running costs. The Court of Appeal upheld the challenge based on European Commission laws

on infrastructure investment. As a result, the treasury may now have to return the extra fees paid by operators, which are calculated to be in the region of £200 million and £300 million, although the ruling could be appealed in the Supreme Court. The FT report quoted an Ofcom representative as saying: "This case raised an important point of law concerning the government's spectrum direction to Ofcom. We are considering the judgement carefully," EE, which was very vocal about its concerns around the issue, said: "We're happy with the outcome as we've always supported the view that the trebling of spectrum fees was excessive and would

harm network investment. With this judgment we can continue to invest in those network improvements that really make a difference to consumers and businesses across the UK." News of the appeal court decision emerged as the UK government released details of fresh funding for key technology developments including 5G and artificial intelligence (AI). In an autumn budget statement, the government announced it would spend £160 million on 5G mobile networks and £75 million on AI, while also announcing plans to put driverless cars on roads by 2021.

DoJ Files Antitrust Suit to Block AT&T, Time Warner Merger

The US Department of Justice (DoJ) has filed a civil antitrust lawsuit to block AT&T Inc's proposed acquisition of media giant Time Warner, arguing that the deal would substantially lessen competition, resulting in higher prices and less innovation for millions of Americans. According to the complaint, which was filed in the United States District Court for the District of Columbia, 'the combined company would use its control over Time Warner's valuable and highly popular networks to hinder its rivals by forcing them to pay hundreds of millions of dollars more per year for the right to distribute those

networks. The combined company would also use its increased power to slow the industry's transition to new and exciting video distribution models that provide greater choice for consumers, resulting in fewer innovative offerings and higher bills for American families'. Responding to the development, David R. McAtee II, Senior Executive Vice President and General Counsel for AT&T Inc, commented: 'Today's DoJ lawsuit is a radical and inexplicable departure from decades of antitrust precedent. Vertical mergers like this one are routinely approved because they benefit consumers without removing

any competitor from the market. We see no legitimate reason for our merger to be treated differently … We are confident that the Court will reject the government's claims and permit this merger under longstanding legal precedent.' Industry observers have noted that President Trump is a vocal critic of CNN, which is owned by Time Warner, and it has been suggested that his prolific Tweets on the subject could yet complicate his administration's agenda, and lead to legal arguments further down the line.

Azur Temporarily Closed by Ministry of Posts and Telecommunications

Azur RCA (Centrafrique), the Central African Republic's fourth largest cellco by subscribers, has been shut down on a temporary basis by the Ministry of Posts and Telecommunications (MPT), reports Journal de Bangui. The decision was made this week following a meeting between the Minister of Posts and Telecommunications, Justin Gourna-Zacko and Azur employees who claimed several months of salary arrears. As previously reported in CommsUpdate, in November 2016 Azur was said to be in financial difficulties, with the company reportedly owing money to its Chinese vendor partner Huawei and failing to pay for its various interconnection agreements. No information has yet been given on when the temporary shutdown implemented this week will be lifted.

EC Takes Steps on Patent Licensing

The European Commission (EC) presented measures to ensure intellectual property rights (IPRs) are "well protected", including steps intended to deliver transparency and predictability to give "a head-start in the global technology innovation race".

As part of a wide-ranging set of initiatives, the watchdog is addressing the issue of standard essential patents (SEPs), which have been the subject of a number of legal actions involving technology companies. These patents, which are necessary to comply with standards including LTE and Wi-Fi, need to be licensed at fair and reasonable rates to enable widespread adoption. The EC said "Europe's potential to lead in global technological innovation and fully grasp the potential of 5G and IoT" is being held back by a lack of transparency and predictability on the conditions under which such patents are to be declared, licensed and enforced. Navigating this may pose particular challenges for smaller players, including SMEs and start-ups in the IoT space, for example. It said it now offers "guidance and recommendations for a balanced and efficient SEPs system where two objectives are reconciled: product manufacturers can access technologies under transparent and predictable licensing rules; and at the same time patent-holders are rewarded for their investments in R&D and standardization activities so that they are incentivized to offer their best technologies for inclusion in standards". Noting the main responsibility to improve the process lies with market participants, the EC said it "aims to facilitate balanced, market-based solutions by outlining principles that SEP holders and implementers may wish to consider". Other areas the commission is looking at include stepping-up the fight against counterfeiting and piracy. The EC will "closely monitor the progress on the proposed measures and assess the need for further steps".

TRAI Recommends Raising Spectrum Caps

India's embattled operators should be allowed to own more spectrum, advised the Telecom Regulatory Authority of India (TRAI) this week. The watchdog recommended that the current cap on total mobile spectrum in a given telecom service area, or circle as they are called in India, should be lifted to 35% from 25%. The TRAI also recommended scrapping the 50% cap on spectrum in any single frequency band, replacing it with a 50% cap on total sub-1-GHz frequency holdings instead. "[The] overall spectrum cap of 25% was imposed at a time when there were six-10 TSPs (telecom service providers) in an LSA (licensed service area)," the TRAI explained. "After the ongoing consolidation in the sector, the number of TSPs in an LSA may be much less." The TRAI also pointed out that capping spectrum caps on specific frequency bands is unnecessary now that spectrum licenses are technology neutral. "Asking a TSP to acquire spectrum in [a] different band to deploy the same technology increases the cost of [the] network with no real gains," the TRAI said. However, sub-1-GHz spectrum is optimal for providing reliable coverage over large areas, the watchdog said. "Therefore, spectrum in [the] sub-1-GHz range… should be treated separately and special provisions have to be made to safeguard against the creation of [a] monopoly," the TRAI said. The recommendations were made in response to an inter-ministerial group (IMG) that called for close examination of the existing rules. This particular IMG has been convened to review industries that are currently under stress, which most certainly includes telecoms. Fierce competition has led to some big names heading for the exit, including Telenor, Tata Teleservices and Tata Teleservices Maharashtra, Aircel, and Reliance Communications. Even the country's leading operators in terms of subscribers are having a hard time, with Bharti Airtel's revenue falling, and Vodafone and Idea Cellular resorting to a merger in a bid to drive scale.

UK Government Pledges Additional £500m towards 5G, Fiber and AI

The U.K. government on Wednesday committed an additional £500 million to boost the country's broadband connectivity. Delivering his autumn budget statement to Parliament, Chancellor of the Exchequer Phillip Hammond said that the government would allocate £500 million to "a range of initiatives from artificial intelligence to 5G and full fiber broadband". While the speech was low on specific details, Hammond confirmed that approximately £385 million of the funds would specifically go towards 5G and fiber to the home (FTTH) infrastructure. In their 2017 manifesto, the Conservative party pledged to have 10 million premises connected to FTTH networks by 2022. Vodafone and CityFiber went some way to achieving this target, when they signed a deal recently to bring FTTH broadband to 5 million homes. This new money will go some way to realizing the rest of the target. Analysts were quick to applaud the investment, saying that the U.K. must act now to avoid being left behind in the race for gigabit connectivity. "5G will have a big bang impact. Its long fuse has today been lit following the Chancellor's deployment of finances that will lay the foundations of 5G readiness. The UK's demand for capacity is insatiable; 5G and fiber networks are required to quench that thirst as 4G capacity is exhausted," said Paul Lee, head of telecommunications research at Deloitte. "We should not think about 5G as just another technology but rather as a building

block for digital transformation. Faster networks with more capacity are prerequisites for a digital nation – it is the nervous system of the digital world," he added. Despite the generally warm reception for the investment, some remain unconvinced that the money is being allocated in the most efficient manner. "It's refreshing to see government investment into connectivity, but 5G will take several years to become mainstream. While it may one day meet expectations, we need a solution now. Our big cities urgently need networks that can support the world class infrastructure that the government wants to build, so instead of holding our breath for 5G we should invest into WiFi technology for a simple, cost effective solution," said Nick Watson, VP EMEA at tech firm, Ruckus. In addition to the £500m investment, the U.K. government pledged to set out rules to better facilitate the development of self-driving cars. It also said that it would set up the world's first national advisory body for artificial intelligence, which will allow the U.K. to focus on the development of new technologies. From 19-20 June 2018, the telecoms industry will come together to discuss strategies for delivering superfast broadband throughout the U.K. at the Connected Britain 2018 event. The event will bring together altnets, telcos and local and national government officials, to present their vision for superfast connectivity throughout the U.K.

ARTICLE

5G Deployment Models are Crystallizing

5G comes with the promise of unseen services and futuristic use cases. Telecom operators and other industry players are making big bets on next-generation services. With 5G, telecom operators can move away from being just connectivity providers to providers of new experiences and industry solutions.

5G will bring new interactive and immersive experiences to customers. Use cases are already being built around immersive sports viewing and augmented-reality applications. Beyond consumer applications, enterprises are actively investigating how they can benefit from 5G, and indeed thinking of deployment models themselves

5G will bring new interactive and immersive experiences to customers. Use cases are already being built around immersive sports viewing and augmented-reality applications.

5G for consumers

- With 5G, telecom operators can
- Provide new **immersive experiences**
- With virtual reality
- Enabled by gigabit throughput and **millisecond latency**

5G for enterprises

- With 5G, telecom operators can
- Provide **industry/ campus specific solutions**
- Leading to higher efficiency, greater productivity, faster time to market
- Built upon **end-to-end QoS** management

Karim Taga
Managing Partner

Glen Peres
Manager

Arthur D Little

(e.g., smart manufacturing). We are also seeing whole industries organize themselves into ecosystems that would collectively benefit from 5G networks and related computing infrastructure (e.g., smart cities).

It is yet to be seen what role operators will play in these ecosystems, beyond facilitating their emergence, but some operators have already begun to shape the value chain and tune their services accordingly. For the first time, operators can play a key role in bringing corporates and industry verticals together, to deliver not just connectivity, but also solutions.
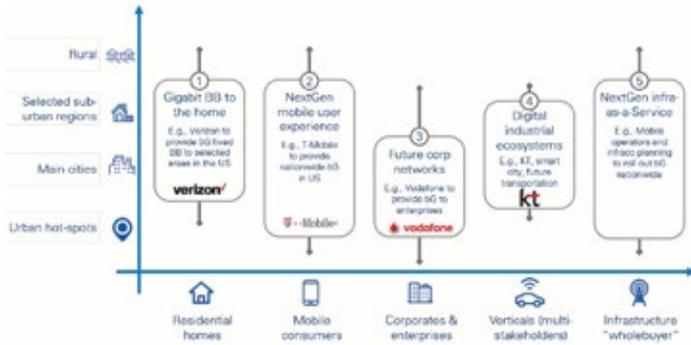
Meanwhile, 5G deployment models are crystallizing. New 5G pilots or technology updates are announced every month. We observe five distinct rollout models used by operators.

1. Provide gigabit broadband to residential homes and an effective last-mile complement to existing fiber or cable networks. Verizon is actively announcing 5G based fixed broadband connectivity to selected cities in the USA.

2. Deliver a next-generation, nationwide mobile experience that enables new use cases driven by virtual reality, tactile internet, etc. T-mobile is announcing 5G mobile rollout with its recently acquired 600 MHz spectrum.

For the first time, operators can play a key role in bringing corporates and industry verticals together, to deliver not just connectivity, but also solutions.

3. Deliver highly reliable, low-latency connectivity and solutions, improving both efficiency and productivity for corporates. Vodafone is partnering with Hitachi to improve reliability and operations of its global fleet of passenger trains

4. Enable digital industrial ecosystems with machine-to-machine connectivity, facilitating new service ecosystems with multiple partners, providers and end users. AT&T recently announced its Network 3.0 Indigo which will use 5G and other technologies to enable its customers to launch gigabit services.

5. Deliver next-generation infrastructure-as-a-service for the entire country. Cities, municipalities and non-telecom operators are entering the 5G infrastructure as a service space with neutral host solutions

Non-telecom players are already active in the 5G-enabled product space, with pilots in autonomous driving, virtual reality-based infotainment services and other use cases. If telecom operators don't act fast, these new players will take an

Non telecom players are moving into the 5G space: Case study – Auto industry

New players such as Apple, Google, Uber are entering & making huge in-roads

Partnership across industries, including with start-ups, is key

Telecom operators are approaching crossroads at which they must decide when and how to prepare for 5G deployment in a manner that will best suit their current market positions and future market needs.

increasingly large share of this new ecosystem.

There are concrete steps that telecom operators can already take to place stakes in their 5G futures. Building an application ecosystem with start-ups and service providers, is key to facilitating future 5G use cases. Preparing the spectrum and infrastructure for future 5G macro and hundreds of thousands of small cells is another step that can be kick-started. Fiberization of fixed-access network, which will assist in aggregating and backhauling multi-gigabit traffic, as well as cloudifying the core to enable easy scale-up and external partnerships will eventually be required. Lastly, they will have to prepare their computing infrastructure to handle this gigabit traffic.

Telecom operators are approaching crossroads at which they

must decide when and how to prepare for 5G deployment in a manner that will best suit their current market positions and future market needs. The five models described above are only a starting point for an operator planning to move towards 5G.

An operator might start with one model, and subsequently expand to other models or use a combination of models. In the future, non-telecom players such as Google, Apple and Amazon, which are active in the IoT space, might also join with 5G-based solutions of their own. Hence, it is important that telecom operators and vendors play an active role in driving the 5G standardizations in the right direction.

For further details, please download the entire report:
www.adl.com/5gdeployment

Telcos should place their stakes in 5G to maximize their chance of winning

Operators should decide now to maximize their future chance of winning

Choosing the right future 5G model

Which infrastructure?
Which existing infrastructure can be leveraged for 5G deployment? eg. low band spectrum, fiber access, etc

Which target segment?
Provide gigabit broadband to homes? Or improve efficiency of specific industry verticals?

Long term roadmap?
What is the end game? Nationwide 5G champion? Or specialized player?

A faster mover can use 5G as a stepping stone to move out of providing just connectivity to a provider to a provider of solutions and facilitator of new ecosystems

Source: Arthur D. Little

Arthur D Little

A SNAPSHOT OF REGULATORY ACTIVITIES IN SAMENA REGION

Algeria

The Minister of Post and Information and Communication Technologies, Iman Houda Feraoun, announced that the country will sign an agreement before the end of the year for a new submarine cable linking the city of Annaba to the US coast. Feraoun also revealed that the operating rights for the new cable will amount to USD 34 million. Regarding progress on the new Oran-Valence submarine cable, she confirmed that the project had been delayed, but that the creation of a subsidiary of Algerie Telecom in Spain should now pave the way for the start of the deployment work. (December 17, 2017)   Huffpostmaghreb

Bahrain

The Telecommunications Regulatory Authority's (TRA) Board of Directors held their last meeting this year, at TRA's headquarters in the Seef District. During the meeting, Board members discussed key issues related to the telecommunications sector in praising TRA's outstanding efforts in the development and growth of the telecommunications sector in the Kingdom of Bahrain, in particular the significant efforts made by TRA resulting in Bahrain maintaining the 1st rank among the Arab countries and ranking 31st globally in the ICT Development Index according to the ITU's latest report, indicating Bahrain's continued development in the ICT sector. These results reflect the foresight and direction of the Kingdom's leadership towards Bahrain being a regional ICT hub and confirm that the efforts made by the Government of Bahrain over the last 15 years have resulted in making Bahrain one of the world's most connected countries. The Board also commended TRA on its leading role in issuing the Consumer Protection Regulation which aims at empowering consumers to make informed decisions and establish the right of consumers and the corresponding obligations of Licensed Operators, and on its role at the GCC level whereas TRA was keen to review and reduce the GCC roaming prices for the benefit of the users. The Board of Directors expressed their thanks and appreciation to the TRA team members for their support and professionalism and outstanding role in developing the sector. This came as a result of the hard work and persistence of the highly professional team members that this was made possible. (December 18, 2017) bna.bh

The RIPE Network Coordination Centre (NCC) and the Bahrain Telecommunications Regulatory Authority (TRA) recently held a training program for telecommunications and ISP staff to instruct them in how to work with IPv6 and deploy it on their networks. The training was part of a TRA initiative aimed at encouraging the development of a roadmap for IPv6 deployment in Bahrain. As the number of devices connected to the Internet increases, network operators are finding themselves running extremely low on unused IP addresses, which are needed for identification and location. This has the potential to restrict the ongoing growth of the Internet in profound ways. Efforts are currently underway around the world to facilitate the shift from the IPv4 (with a total of 4.3 billion addresses) to IPv6 (with 340 trillion, trillion, trillion addresses) which will safeguard the future growth of the Internet. The rapid growth in digital technology has stimulated huge demand for Internet services and brought social and economic development globally. By sharing its expertise with network operators and helping them to future-proof their networks, the RIPE NCC is helping to drive sustainable development and economic growth across the Middle East. Paul Rendek, Director of External Relations at the RIPE NCC, commented: "The RIPE NCC is committed to supporting efforts across our service region to develop network infrastructure and we applaud the commitment our members have shown to using training and workshops to gain greater understanding and identify the key factors that will drive IPv6 deployment. IPv6 has a crucial role to play in the ongoing development of the Internet." The RIPE NCC has members in 76 countries across a service region that spans Europe, the Middle East and parts of Central Asia. In recent years, the Regional Internet Registry has been investing in greater outreach and training efforts to support its wide and diverse membership. (December 15, 2017) tahawultech.com

The Telecommunications Regulatory Authority (TRA) published The Annual Market Indicator's Report 2016 and first half of 2017, which highlights the continuing move towards data consumption. This 2016 report reveals important trends in how citizens in Bahrain use telecommunication services; this data-driven shift is the most noticeable change that continues in occurrence during 2017. As the number of mobile and fixed telephony services has dropped by 11% and 4% consecutively, between end of 2016 and first half of 2017, the broadband subscriptions only declined by 0.2% over the same period. That drop came after a huge jump of subscribers during 2016 due to zero rated packages introduced by telecom operators, which is the practice not charging end customers for data

used by specific applications or internet services. With 2.67 million mobile connections and population of 1.45 million the penetration rate reached 184%, the market became saturated and the growth rates have fallen to their lowest level during 2017. With more rationalized market structure, the number of new mobile subscriptions has decreased, while the level of competition between service providers has increased to attract ported subscribers by offering better customer service, network coverage, and service quality. The fixed wired broadband subscriptions continued to rise due to increase demand on fiber connections. Uptake of faster broadband services is on the rise as forty-eight per cent of all fixed broadband connections were able to receive access speeds of 10Mbit/s or more in 2016, up from thirty-six per cent a year previously. Conversely, packages with slower speeds have been declining in popularity. At the end of first half of 2017, nearly 71% of mobile subscriptions have data subscriptions, up from 64% in 2016 and 57% in 2015. Uptake of faster data networks has gone hand-in-hand with increasing use of data services –average monthly data use per fixed wired broadband connection increased by 30% to 70.2 GB in Q4 2016 comparing Q4 2015, and average monthly data use per mobile broadband connection increased by 37% to 7.8GB over the same period. This report shows that, in general, mobile and fixed line telephony revenues are holding up well, despite increasing use of 'over-the-top' internet services such as those provided by WhatsApp, Instagram and Snapchat. "We are delighted to present the 12th consecutive edition of Annual Market Indicators Report covering 2016 and up to first half of 2017." Says Sh. Nasser Bin Mohamed Al Khalifa, Acting General Director of TRA. "This report provides a comprehensive overview of the evolving telecommunication environment in Bahrain, with a particular emphasis this year on the continued growth of internet subscriptions and data consumption. In the past year, data consumption increased by 53 percent to over 296.5 million gigabytes. TRA is committed to achieving the fourth National Telecommunications Plan (NTP) goals, as we work diligently with all concerned stakeholders to enhance the telecommunications infrastructure to increase coverage of the high-speed fiber-optic network and to ensure the provision of high-speed services at affordable prices, which will contribute to enhancing the Kingdom's economic development." Sh. Nasser further added that, "The objective of this report is to be a vital source to policy-makers, government entities, telecom operators, international bodies, and consumers; helping them to make informed decisions about the developments in the telecommunications sector in the kingdom. This report is one of the tools we use to monitor the developments in Bahrain's telecommunication environment. TRA always welcomes feedback on these reports." (November 28, 2017) tra.bh

The Telecommunications Regulatory Authority (TRA) has withdrawn all telecommunications licenses of Bahrain Broadband (Greenisis), and cancelled Northstar Technology Company's International Telecommunications Facilities License. No reason was given for Bahrain Broadband's revocation, but Northstar's facilities-based international license cancellation was made after the company submitted a voluntary revocation request. The TRA has asked that any objections to the decision regarding Northstar should be submitted in writing no later than December 2, 2017 and objections regarding Bahrain Broadband have until December 15, 2017. The Bahrain Broadband previously operated an iBurst-based wireless broadband network under the Greenisis brand, but the company appears to have ceased operations, with its website discontinued. Northstar, on the other hand, continues to offer a range of B2B-focused broadband access, voice calling and other services. (November 23, 2017) telegeography.com

The Telecommunications Regulatory Authority (TRA) is continuing to implement its SIM card verification plan, which the regulator began in July this year. TRA Consumer Affairs Manager Mariam Al Mannai explained the reasons for the continued SIM registration: 'It's been determined in the past that a high number of individuals have been taken advantage of because of a security gap when consumers take on SIM-enabled services, mainly due to the verification process not being sufficient. It was brought to our attention that consumers have had multiple SIM cards in their name without their knowledge, and they discovered they had to pay for services they never asked for. This, of course was unacceptable and the TRA had to take action.' Bahrain's mobile network operators (MNOs) agreed on biometric scans to safeguard consumers' identities and prevent those becoming victims of fraud. Post-paid mobile subscribers have until June 2, 2018 to register their SIM cards before their account is suspended, while pre-paid users will have until March 2, 2019 to register their accounts. (November 20, 2017) telegeography.com

Bangladesh

The telecom regulator has resumed processes to award 524 new licenses for internet service providers after a lull of one and a half years as the telecom division broke its silence on approving BTRC's recommendations. The Bangladesh Telecommunication Regulatory Commission (BTRC) will begin handing over the licenses from next week and has already sent letters to the applicants asking them to deposit bank guarantees and fees and submit related documents, said a top official. However, the Internet Service Providers Association Bangladesh (ISPAB) said it would invite more trouble for the business as most of the new entities are either politically backed or run by hoodlums.

About 500 ISP licenses exist at present and though the number will double, the business volume is not growing proportionally, said MA Hakim, president of the ISPAB. "We know that the market size, the user number and the usage are growing but the business is not increasing at that rate," said Hakim. Of the approved licenses, seven is to run business nationwide, 14 in zones in Dhaka and adjoining areas, 81 in zones in the rest of the country, 216 in divisional towns, 28 in districts and 178 in upazilas, said a senior official of the regulator. There are currently 499 entities operating ISP business, including 117 nationwide, 73 in Dhaka and adjoining areas, 57 in zones in the

rest of the country, 175 in divisional towns, 29 in districts and 48 in upazilas, according to BTRC data. "We know that this is a huge volume of licenses and it can create some challenges, even for our day-to-day monitoring and regulatory tasks," said the BTRC official requesting anonymity. BTRC Chairman Shahjahan Mahmood at a meeting with reporters on November 29 said the commission's activities have been facing stagnancy since 2010 as the posts and telecommunications ministry took over authority over some issues. He said the Ministry has not issued new licenses for over a year for bureaucratic complexities. Anyone meeting the criteria can apply for ISP license and the telecom regulator only scrutinizes documents and makes recommendations to the government, said the BTRC official. The government takes all the decisions on awarding new licenses and renewals as per the Telecom Act. The BTRC also sent 350 applications on license renewals in the last 18 months. The telecom division is yet to take decision about them. Md Emdadul Haque, General Secretary of the ISPAB, said internet business has been going through tough times as there is a lot of confusion everywhere, starting from licensing to monitoring. He said there are over 4,000 illegal internet business entities, so the threat for cyber-attacks for the country is mounting. "We are observing a lack of regulation in the internet business," Haque said. The ISPAB has sent a letter to the BTRC, seeking an appointment to sit and discuss the issue. There are about 53 lakh active internet connections linked to ISPs as of November using over 350 Gbps of bandwidth, according to the BTRC. The country's total bandwidth consumption is about 530 Gbps.

(December 26, 2017) thedailystar.net

The Bangladesh Telecommunication Regulatory Commission (BTRC) has invited bids from existing mobile operators in Bangladesh for the award of spectrum in the 900MHz, 1800MHz and 2100MHz bands for 2G/3G/4G LTE services. The regulator said that the auction will also be open for new entrants, subject to a successful primary evaluation of their offers. In the event — scheduled to be held on 13 February — the BTRC is planning to issue the following technology-neutral spectrum:

- Five paired blocks (2×5MHz) of 2100MHz spectrum: 1920MHz-1925MHz/2110MHz-2115MHz, 1925MHz-1930MHz/2115MHz-2120MHz, 1830MHz-1935MHz/2120MHz-2125MHz, 1970MHz-1975MHz/2160MHz-2165MHz, 1975MHz-1980MHz/2165MHz-2170MHz
- Four paired blocks in the 1800MHz band: 2×5.6MHz (1762MHz-1767.6MHz/1857MHz-1862.6MHz), Two 2×5MHz blocks (1767.6MHz-1772.6MHz/1862.6MHz-1867.6MHz and 1777.6MHz-1782.6MHz/1872.6MHz-1877.6MHz) and 2×2.4MHz (1782.6MHz-1785MHz/1877.6MHz-1880MHz)
- Two paired blocks (2×1.8MHz and 2×1.6MHz) in the 900MHz range.

According to the BTRC, all interested parties need to submit their bids by January 14, with the commission planning to publish a list of qualified bidders on January 25; the winning applicants will be notified on February 14. Going forward, the BTRC will rearrange the awarded spectrum in the three bands after the auction, in order to ensure that operators have continuous assignments.

(December 5, 2017) telegeography.com

All the barriers to rolling out 4G mobile services have now been cleared after Prime Minister Sheikh Hasina, who is also in charge of the telecom ministry, gave a go-ahead to the revised guideline on spectrum auction. "All the issues raised by the mobile operators have been addressed," said a top official of the telecom division. The Bangladesh Telecommunication Regulatory Commission will now move to hold an auction for spectrum allocation and 4G license. The auction can be expected in January next year and not in December as previously planned. BTRC Chairman Shahjahan Mahmood is yet to get the approved copy of the guideline from the prime minister. Once that arrives, the commission will publish an advertisement for the auction. "We will not wait for a single day after getting the revised guideline," Mahmood said, adding that people should be able to enjoy the new service as soon as the licenses are awarded since mobile operators are all set for rollout. The telecom regulator will give the mobile operators less than two weeks to submit their applications, after which it will take another 45 days to arrange the auction, said a top official of the regulator. Earlier in September, the telecom division approved the guideline on 4G licensing that was picked apart by the operators, with about two dozens of concerns being raised. The parent companies of the top three mobile operators even threatened to boycott 4G licensing. After that, Prime Minister's ICT Affairs Adviser Sajeeb Wazed Joy took the initiative to address the operators' concerns. One of the demands of the operators was to cut down the price of spectrum for technological neutrality, which will empower them to deliver better service quality. They asked for it to be slashed to US$4 million per megahertz of spectrum from US$7.5 million. As per their wishes, the government has also allowed the operators to borrow from local banks -- a move that will ultimately help banks as they are sitting on idle money. Earlier, the telecom watchdog had recommended making it mandatory that all investment be in foreign currency. As per the new decision, the operators will not be required to obtain no-objection certificates from the telecom regulator in advance about their corporate social responsibility projects. They will also not need to go for an initial public offering, which the previous guideline had called for. What would constitute as 4G speed has also been redefined: it would now be only 20 Mbps instead of 1 Gbps. The previously approved guideline also empowered the regulator to confiscate all the unused balance of users. The clause has now been dropped in the revised guideline. As per the new guideline, the operators will have to store subscribers' usage data for only two years and not 12 years as previously stipulated. The part that said the telecom regulator can change the percentage of revenue sharing from time to time -- a clause that created panic among operators -- has been scrapped entirely. The operators will now have to share 5.5 percent of their revenues from 4G service with the telecom regulator and the percentage will remain the same for the next 15 years. (November 29, 2017) thedailystar.net

Internet usage by way of the faster third generation mobile telephony technology data has finally got the traction befitting of the investment made by the operators as people are progressively becoming habituated to digital services. As of June, the total active 3G SIMs stood at 4.97 crore, up 72.60 percent year-on-year, according to the draft of the Bangladesh Telecommunication Regulatory Commission's annual report,

which will be published shortly. Subsequently, total number of SIMs that have not connected with the internet or are only using 2G internet has declined markedly. As of June this year, 72.35 percent of the 6.87 crore active SIMs with internet connection was enjoying the fastest data service, according to the report. As of June, the total active SIMs were 13.60 crore. In contrast, a year earlier, 48.28 percent of the 5.97 crore active SIMs with internet connection was enjoying 3G service. In June 2015, the 3G usage was only 37.19 of the total internet customers then. But the mobile operators are still not satisfied with the development. The telecom industry did not get as much business as they had expected from 3G services, said top officials of different mobile operators. "Our 3G network coverage is more than 60 percent of the population, but we are getting only few customers for those services," said Mahtab Uddin Ahmed, chief executive officer and managing director of Robi. The industry as a whole invested Tk 32,000 crore for 3G but total revenue from this segment was only Tk 6,000 crore up to December, Ahmed said recently. Users are currently using high volumes of data, which is encouraging for the mobile operators, said Mahmud Hossain, chief corporate affairs officer of Grameenphone. Grameenphone's per customer data usage in a month, as of September, stood at 754 MB, Banglalink's 523 MB and Robi's 465 MB as of March. "At Grameenphone, we are happy that the industry is moving fast. " Handset is crucial for the enjoyment of 3G service, he said. At present, only 30 percent of the handsets in Bangladesh are smartphones that can used for 3G data. "And the growth of smartphones is not satisfactory," he said, adding that the frequent increase in taxes on handset import is to blame. Alternatively, if the government allowed the mobile operators to import handsets directly, it would have had a huge impact on the market, he said. However, data users and experts remain unimpressed about the quality of 3G service in Bangladesh, which could explain the below-par growth in numbers. "The huge number of 3G customers does not give you the right information about service quality," said Mustafa Jabbar, president of the Bangladesh Association of Software and Information Services. The services that customers are getting as 3G from the operators are terrible, he said. "The operators are offering data in megabytes but what users are getting is only a

few kilobytes," he added. (November 27, 2017) thedailystar.net

As much as 65 percent of Bangladeshi consumers are keen to adopt digital payment solutions, indicating increased awareness and acceptance of electronic forms of payments in the country. The study was carried out by YouGov, an international Internet-based market research and data analytics firm based in London, on behalf of Visa, the global leader in digital payments technology. About 2,000 people in India, Bangladesh and Sri Lanka were surveyed in October this year. The survey was aimed at understanding the pulse of the Bangladeshi consumer and their views towards the transition to a digital economy. About 74 percent of the respondents said the key driver for adoption is the ease of transition into digital form factors of payments. Some 54 percent of the respondents said the main reason for moving away from cash is convenience, while 40 percent vouched for efficiency and speed of transaction offered by digital modes. Of the respondents for whom the adoption was tough, 69 percent find insufficient modes of payments as the key barrier, while 25 percent are worried about the security of their transactions. Significantly, over half of the consumers, or 55 percent, value security more than convenience when it comes to making payments online. "This is similar across the board -- gender, ages, household income and even education levels," said Visa in a statement. The survey also showed that millennials are more likely to use digital payments for everyday essentials like shopping at supermarkets, online, department stores, restaurants and travel than the other generations. The inclination towards embracing digital payments is higher amongst those from a higher income household, the study found. The Internet of Things, contactless payment technology, enabling simplified, secure and faster ecommerce experience are some of the trends defining the next wave of payments.Cash usage continues to show steady decline: from over 52 percent last year to 49 percent currently. It is expected to come down further to about 46 percent over the next 12 months, according to the survey. On the contrary, preference for digital payment instruments such as cards continues to be on the rise, with over 32 percent respondents opting for these currently as against 29 percent a year back.

(November 20, 2017) thedailystar.net

Egypt

The National Telecommunications Regulatory Authority (NTRA) says it is considering ways to offer new frequency bands to mobile operators. Acting Executive President of the National Telecommunications Regulatory Authority (NTRA) Mustafa Abdul Wahid said that the price and conditions will be determined according to available frequency and type of bandwidth.
(December 12, 2017) Daily News Egypt

Mustafa Abdul Wahid, Acting Executive President at Egypt's National Telecommunication Regulatory Authority (NTRA), has revealed that all four of the nation's mobile network operators (MNOs) are seeking additional spectrum suitable for the provision of 4G services. The Executive was cited as saying that Orange Egypt, Vodafone Egypt, Etisalat Misr and Telecom Egypt

have made official requests for new frequencies with a view to keeping up with demand for their respective LTE-based offerings. Wahid said the MNOs' requests are now being studied, and the NTRA is understood to be coordinating with other relevant authorities regarding the possibility of opening up access to new spectrum. Meanwhile, in confirming that his company had indeed made an application for new spectrum, Ayman Essam, Head of Corporate Government Relations at Vodafone Egypt, said: 'The frequencies we have already obtained are sufficient for the current generation of 4G services, however, we will need new frequencies for the next two years, 2018 and 2019, given the expected increase in the number of 4G users. They will also be necessary to provide new applications for users.'
(December 7, 2017) Daily News Egypt

Iran

The latest data on ICT development from International Telecommunication Union shows continued progress in connectivity and use of information and communications technologies in Iran. The report names Iran "the most dynamic country" in terms of ICT Development Index (IDI) value in Asia. Iran's 0.54-point improvement from 5.04 to 5.58 points (out of 10) has enabled a rise of four positions in the global ranking. According to IDI 2017 report published on ITU's official website, Iran ranks 81 globally and 12th in Asia. Furthermore, the report indicates that on the global level the most substantial improvements in IDI value were in Namibia, Iran, and Gabon. Based on data from the end of 2016, the IDI report ranks the performance of 176 economies with regard to ICT infrastructure, use and skills based on internationally comparable data and agreed methodologies between the member states of ITU. Some of the indicators included in the IDI are relative numbers of fixed and mobile telephone subscriptions, households with a computer and Internet access, average Internet bandwidth per Internet user, the percentage of individuals using the Internet, relative number of fixed-broadband and mobile-broadband Internet subscriptions along mean years of schooling which include courses in ICT skills. According to the report, Iran has shown significant improvement in every aspect of ICT development index with a particularly high rate of improvement (68.7%) in the number of mobile-broadband subscriptions per 100 people, as well as notable improvement in Internet users and households with Internet access. Furthermore, citizens' access to ICT technology in Iran has been improved by more than twice the average global increase. The average global increase was 0.20, while the access index in Iran was up 0.41 points, reaching 6.74 (out of 10). Iran saw improvement in all access indicators. The rankings of most economies in the access index have changed little over the year, with Iran showing the highest gain (up 9 places). Iran's Access Rank is 67. During the past decade in Iran, there has been a sustained growth in the availability of communications, especially in urban areas, led by growth in mobile communications and, more recently, by the introduction of third and fourth generation of mobile telecommunication technologies (3G and 4G). Similarly, there has been rapid growth in mobile-broadband services globally. The number of mobile-broadband subscriptions worldwide now exceeds 50 per 100 inhabitants, enabling improved access to the Internet and online services. According to ITU, 33.8% of Iranians had access to such services by the end of 2016. Furthermore, mobile-cellular networks are increasingly pervasive and now dominate the provision of basic telecommunication services in Iran and most other countries. The number of mobile-cellular subscriptions worldwide now exceeds the global population although many individuals, especially in developing countries, still do not use a mobile phone. The number of fixed-telephone subscriptions has continued to fall dropping below 1 billion worldwide and is particularly low in the least developed countries. The number of mobile phone subscriptions exceeds the population in Iran as well. The number of fixed-telephone subscriptions remained fixed in the country. There are substantial digital divides between countries and regions and between developed and developing countries. The same divide can be observed in urban and rural areas in Iran. Citizens and experts in the country have often called on the government to address the digital divide between the more and less connected areas. In September, a lawmaker in Tehran castigated the government and local operators for not paying enough attention to the underdeveloped telecom infrastructure in rural areas. Ali Asadi Karam said, "Dozens of villages do not even have access to conventional telephone services" and also suffer from lack of Internet services. The MP said the Telecommunication Company of Iran has been rather "discriminative" in providing telecom services in rural areas. "The company simply does not offer any services in several areas." It is said that low yields on infrastructure investments in the small rural areas are the main reason the TCI and other private companies are not interested in working in the remote regions. However, if Iran aims to achieve sustainable growth, the government and operators should also strive to improve and expand ICT infrastructure in the faraway areas.

(November 27, 2017) financialtribune.com

In a move to expand access to the Internet, the Telecoms Ministry in collaboration with Communication Regulatory Authority has introduced a mandatory landline Internet Fair Usage Policy, which will be enforced from December 1. Telecom Minister Mohammad Javad Azari Jahromi has often censured local Internet service providers for their excessively high tariffs. "In establishing the new FUP system the interest of both consumers and businesses has been considered," the ministry's website quoted him as saying. According to online database Numbero, Internet services in Iran are the 4th most expensive globally. This is while Internet speed is relatively low compared to neighboring countries and users often complain about disrupted connections. Statistics released by the Internet World Stats indicate that some 57 million Iranian's (70% of the population) have access to the Internet. This is while International Telecommunication Union put Internet penetration rate in Iran at 44% in 2015. The significant hike to some extent has been due to introduction of third and fourth generations of mobile communication technologies in Iran. Through the newly introduced system Fair Internet Usage, or FUP, each landline ISP is required to announce a bandwidth cap for different Internet speeds before December 1. A bandwidth cap, also known as a band cap or a data cap, is a limit imposed on the transfer of data over a network. Although often referred to as a "bandwidth cap", it is not the actual bandwidth (bits transferred per second) that is limited, but the amount of data downloaded per month. The Minister says "If a user exceeds data cap the ISP henceforth cannot disconnect the user but is allowed to decrease the Internet speed to 128 Kbps and not lower." Even with the lowered speed users can access websites and online services with a relatively low, but acceptable, speed. Furthermore, service providers should notify customers before reaching the cap. Users can pay additional fees to forestall the decrease in speed. For the 'extra Internet usage' ISPs cannot charge subscribers more than 20,000 rials (50 cents) per gigabyte. The current average price for each extra gigabyte of Internet usage

is about 40,000 rials (US$1). One of the underlying reasons for introducing the Fair Internet Usage system is to help lift content delivery and production services. The content an average subscriber uses consists mainly of video files and the content producers income is often generated from advertisement embedded in the videos. However, since the volume of data users are currently allowed to download is unreasonably low — 2-3 gigabytes per month — the content delivery and production services are disadvantaged. Many ISPs in addition to Internet services offer content production and delivery services as well; this is likely to motivate them to support the new government scheme. Through the scheme, a maximum monthly fee has been set based on Internet speed ranging from 125,000 rials (US$3) for 512 Kbps services to 800,000 rials ($20) for a 16 Mbps connection. ISPs have not yet announced the bandwidth caps. Earlier, the CRA deputy director Sadeq Abbasi Shahkoh

suggested that the fair data cap for a 2 Mbps connection would be about 300 GB. According to the ministry, the service should not cost more than 250,000 rials ($6) per month. Even if the data cap is one tenth of the announced limit, many users will find the monthly charges reasonable. Furthermore, ISP services will be monitored by CRA and according to Jahromi in case businesses fail to comply with terms of their agreement with subscribers, the ISP will be fined. One of the indicators that will be checked by CRA will be the agreed Internet speed. Internet speed should not be lower than what is mutually agreed and fluctuations of not more than 5% will be disregarded by the state regulator. The new prices are significantly lower than what ISPs currently charge users in Iran. However, the new policy and the 'fairness' it promises cannot be judged before the businesses announce the data caps.
(November 22, 2017) financialtribune.com

Iraq

UAE-headquartered Restrata, a top security solutions provider, through its wholly owned Iraq entity, has been awarded a national Communications and Media Commission (CMC) license to sell and maintain GPS tracking systems in Iraq. The CMC License for GPS Tracking is an Iraq Government mandate and is being enforced locally through inspection teams running compliance checks on both vendors of GPS tracking systems, and their end users. A Restrata spokesman said of the award: "We praise the Iraq Government for taking a proactive stand on

GPS Tracking standards and for championing the highest levels of compliance." The move affirms Restrata's commitment to compliance and providing this life-saving technology to companies operating in challenging environments, a statement said. Restrata has been operational in Iraq more than a decade on a variety of safety and security consultancy and training projects covering Rumaila, Majnoon, West Qurna, Khor Al Zubayr and Baji.
(November 29, 2017) tradearabia.com

Kuwait

Khaled Al-Kandari, Deputy Head of Kuwait's Communication and Information Technology Regulator Authority, called for boosting cooperation among Arab countries in communications field. Al-Kandari was speaking to KUNA following a meeting of the executive office of the Arab Ministers of Communications, and said the officials discussed an Arab initiative for internet governance. He added they also discussed linking Arab

countries through an internet network, an Arab initiative over smart education and a regional forum on digital content. Cyber-security, confronting online crime and terrorism, and abuse of applications were also discussed, he said. The executive office includes Tunisia, Kuwait, Sudan, Jordan, Saudi Arabia, Qatar, Comoros and Mauritania.
(December 4, 2017) menafn.com

Lebanon

The Ministry of Telecommunications has resurrected a law to reduce illegal imports of counterfeit devices. This law was negated in 2014 , however to regulate the Lebanon Mobile devices market, Government has ordered to make this law effective from February 1,2018. MoT Lebanon Reactivates Illegal & Counterfeit Mobile Phone Regulation Law. MoT in Lebanon has decided to maintain a database of IMEI number for devices in collaboration with telecom operators. IMEI is a database of serial identification numbers. The device will not be

able to access the network until it is identified by the database. This law includes all the devices such as phones, tablets and routers which accesses telecom networks through SIM cards. The law will further ensure that mobile licensees actively identify such phones on their networks and maintain and update industry-wide database with information about such phones for the benefit of the mobile services sector worldwide. Pakistan, Indonesia, Turkey and other countries in the region has already drafted regulations as such illegal devices are hurting

the mobile eco-system. Importers will have to get approval of MoT for their devices. Mobile licensees will become members of the International Mobile Equipment Identity Database (IMEI DB, formerly the CEIR) operated by the GSMA. If the meet GSMA technical standards, they will be allowed to ship devices under proper customs and Value Added Tax channels. Distributors who already have original but unlawful, unused devices can get approval from Lebanon ministry for accessing networks. They will also have to pay custom fees, VAT and also some additional fines. Travelers who visit Lebanon will not be able to use their unregistered device after the period of 90 days in a year. Alain Barakeh, Business Unit Manager at Samsung CTC, agent of Samsung products, said: "Mobile users will greatly

benefit once the market operates legally as they will get original devices, manufacturers' guarantees, and reliable after-sales services. These procedures will have no impact on the current market prices of original products." MoT also ordered end users of illegally imported devices, who have not used phones before December 11, 2017 to regularize their devices before using it. Ministry of Finance and Mot has allowed the users already having counterfeit devices to use their illegally imported phones without any implications. Reactivation of this law will help enhance government revenue by allowing devices imported through proper channel. The government will not only monitor devices brought in Lebanon but will also check the installed base of devices currently active or sold in channel.
(December 14, 2017) phoneworld.com.pk

Nepal

According to Measuring the Information Society Report published by International Telecommunication Union (ITU) in June 2017, Nepal stands fifth in Information Communication Technology (ICT) development among the SAARC countries. The study was done on the basis of ICT readiness, i.e. infrastructures and reach of IT, ICT usage and ICT capability. Below is the report of the study showing statistics of the SAARC countries: Also, according to the same report, Iceland is the most developed country in the field of ICT with 8.98 score on the chart. Similarly, Korea stands second with 8.85. The third, fourth and fifth places are taken by Switzerland, Denmark, and the UK respectively with the scores of 8.74, 8.71 and 8.65. Among 176 countries taken for the study, Nepal stands at 140th position. Among the SAARC countries, Maldives stands at 85th position, Sri Lanka at 117th position, Bhutan at 129th position and India at 134th position. Bangladesh, Pakistan, and Afghanistan fall behind Nepal on this list standing at 147th, 148th and 159th position respectively. The 140th position of Nepal in this list is not satisfactory, according to Minprasad Aryal, Nepal Telecom Authority (NTA) spokesperson. He added that there can be some

satisfaction when only SAARC countries are taken into account, but the fall of Nepal from the 89th position among 152 countries in 2010 to 140th position at present shows that the country is falling behind in development. While Nepal has made much progress in the field of ICT with the rapid increase in Mobile and Internet users, the reason behind Nepal falling behind on the list is that the other countries have made progress in a much faster rate than ours. However, Nepal is third on the basis of the reach of mobile and fixed telephone services. According to the report published in December 2016, the total number of mobile SIM users was 121.23% of the total population and that of fixed telephone users was 3.24%. As per the latest report of NTA however, the total number of mobile SIM users is 131.64% of the total population and that of fixed telephone users is 3.24%. Aryal mentions that Nepal is falling behind in development when compared with other SAARC countries. He added that it is necessary for NTA to organize programs to bring necessary changes in remote areas of Nepal in the field of telecommunication.
(December 6, 2017) techlekh.com

Oman

Cell towers across the nation will be monitored to gauge emissions, the Telecommunications Regulatory Authority (TRA) has announced. The TRA has collaborated with the Ministry of Environment and Climate Affairs (MECA) to ensure that all towers follow the standards set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the World Health Organization. While mobile phones are now an integral part of our lives, emissions from towers can prove harmful if they exceed a certain threshold. The project follows a similar study undertaken by the Sultan Qaboos University on behalf of the Majlis Al Shura recently, and Dr. Bourdoucen Hadj, Dean of the College of Engineering at the university, was one of the primary researchers in that study. "What the TRA is doing now

is providing a wide coverage with international companies to meet global standards, to check the quality of service, to see if people are obeying the laws, and to see if the standards in terms of power, speed and time delay are being met," he explained. "The TRA are checking if the standards are being promised. "If electromagnetic radiation goes beyond a certain limit, it might cause sicknesses such as cancer, so the ICNIRP maintains the electrical limits and works with the WHO to ensures that the providers do not go beyond a threshold, because if they put more power in these towers, they may have increased coverage, but you also have increased radiation, which is bad for the human body," added Hadj. "If people are not really educated about this, they will have negative views on telecom towers,

and they will psychologically reject these services, even though telecommunications are very important for daily life," he said. "People need to have a good understanding about this, and this exercise by TRA is extremely important. It is to do with quality assurance, protecting people and ensuring that the telecom providers install towers which are safe." Emissions from 10 per cent of all of Oman's towers will be measured from 16 different points around the tower, with measurements being taken across 2G, 3G and 4G frequencies to ensure that adequate safety standards are being met. "The measurements include electric field, magnetic field and the magnetic flow of each point, and the results are compared with the permitted ranges according to the ICNIRP Guidance and Standards," said a statement from the TRA. "It is worth mentioning that the Ministry of Environment and Climate Affairs has issued Ministerial Decision No. 25/2015 on environmental regulations and guidelines for establishing, installing or operating base stations for mobile communications towers and antennas." The World Health Organization also conducts studies to ensure people's health is not compromised by electromagnetic radiation from towers. "The international pooled analysis of data gathered from 13 participating countries found no increased risk of glioma or meningioma with mobile phone use of more than 10 years," stated the WHO. "There are some indications of an increased risk of glioma for those who reported the highest 10 per cent of cumulative hours of cell phone use, although there was no consistent trend of increasing risk with greater duration of use. The researchers concluded that biases and errors limit the strength of these conclusions and prevent a causal interpretation. "Based largely on these data, IARC has classified radio frequency electromagnetic fields as possibly carcinogenic to humans (Group 2B), a category used when a causal association is considered credible, but when chance, bias or confounding cannot be ruled out with reasonable confidence," added WHO. "While an increased risk of brain tumors has not been established, the increasing use of mobile phones and the lack of data for mobile phone use over time periods longer than 15 years warrant further research of mobile phone use and brain cancer risk," noted the organization. "In particular, with the recent popularity of mobile phone use among younger people, and therefore, a potentially longer lifetime of exposure, WHO has promoted further research on this group." (December 13, 2017) timesofoman.com

Pakistan

Pakistan Telecommunication Authority (PTA) – dynamically engaged in changing telecom landscape of Pakistan – has tackled every new challenge with determination, keeping interest of the country at heart of its regulatory decisions. The Authority sustains on research in regulation, technical astuteness, harmonizing competition and discharging its social responsibility with the patronage of the Government of Pakistan. Under patronage of current democratic government, PTA has been actively pursuing its broader objectives and targets for the development of telecom services and protection of consumer rights. It believes that performance of telecom sector is true reflection of its successful regulatory initiatives and reforms. The Authority in its latest report, highlighting industry issues and way forward said today, Information and Communication Technologies (ICTs) solutions, being offered on mobile broadband, are making a big difference in every walk of life. However, there are several industry challenges that are needed to be addressed in near future. It is indeed a challenge to keep up with the rapid modernization in telecom systems and to bring latest ICT innovations in Pakistan. Rationalization of Taxes in telecom sector was a major challenge being faced by industry for past few years. After coordinated efforts of PTA and telecom industry, Withholding Tax has been brought down to 12.5 per cent from 14 per cent. However, the Withholding Tax @ 12.5 per cent on every mobile recharge is still high because majority of subscribers fall below threshold of being a tax payer and hence, cannot get paid amount adjusted in their annual tax returns. Similarly, Federal Excise Duty (FED) has also been decreased to 17 per cent from 18.5 per cent. However, the tax rates by Provincial Revenue Authorities are still quite high and should be reduced, following the example of Federal Capital. Harmonization of Federal and Provincial Tax Laws is important to resolve sales tax collection issues and avoid undue litigation between operators and the Federation. Telecom sector should be granted the industrial undertaking status so that the mobile operators are able to adjust the income tax paid at time of import of telecom equipment, which is treated as a final tax liability. High custom duty and other taxes on import of mobile handsets and telecom equipment also impede mobile penetration. Moreover, the report said the intense price wars among the operators topped with fierce competition with the Over-the-top (OTT) services and grey traffic is shrinking the Average Revenue per User (APRU) of the industry. Telecom access and expansion is hampered by the lingering Right of Way (RoW) issues, utility infrastructure and procedural delays in the approvals process at provincial government's level. PTA has exerted tremendous efforts to improve the national and international connectivity of the country by providing regulatory facilitation to interested operators.
(December 10, 2017) pakobserver.net

Pakistan Telecommunication Authority (PTA) has released Annual Report 2017. It has stated in the report that Pakistan will emerge as the first nation in South Asia to introduce 5G internet services. PTA Applauded the 5G Developments in Pakistan, also Suggested Reduction in Taxes. Pakistan would even beat the largest regional nation, India. Because India is also in the run for introducing the most advanced internet service. According to the PTA's Annual Report for 2017, Pakistan has started the preparations to test 5G cellular connectivity and it is expected to be launch this 5G technology by 2020. Almost two months back, the federal cabinet gave permission to cellular companies to test 5G technology in Pakistan. Federal Cabinet let the cellular companies to test within the existing regulatory environment with 0% charging the users. Network and cellular companies are carrying various lab and field to launch the technology as

soon as possible. Due to geo-political importance of Pakistan, Security of Data and Critical Information Infrastructure (CII) is also an important issue. That's why PTA is preparing guidelines for implementation by the telecom licensees. It has been also discussed in Pakistan Telecommunication Authority's report that the withholding tax of 12.5 percent on every mobile recharge is high. As majority of the subscribers fall below the threshold of being a tax payer therefore they cannot get the paid amount adjusted in their annual tax returns. It is mentioned in PTA's annual report that high customs duty and other taxes on the import of mobile handsets and telecom equipment, are the major hurdle in the mobile penetration. For the past few years rationalization of taxes in the telecom sector remained a major challenge, which was being faced by the industry. PTA's annual report stated that no doubt federal excise duty (FED) has also been decreased to 17 per cent from 18.5 per cent, but it is still high and should be reduced. It is also suggested that the telecom sector should be given the status of the industrial undertaking so that the mobile operators can adjust the income tax paid at the time of import of telecom equipment. The tremendous efforts of PTA by providing regulatory facilitation to the interested operators will definitely improve the national and international connectivity of the country.
(December 6, 2017) phoneworld.com.pk

Saudi Arabia

Communications and Information Technology Commission (CITC) and Zain KSA signed an agreement to implement three high-speed wireless broadband projects for remote areas of the Kingdom as part of the Universal Service Fund. The three projects are expected to provide service to more than 800,000 beneficiaries in 3,900 villages across 28 districts of Riyadh, Eastern Province, Asir Region and Makkah. Zain KSA confirmed on Sunday that it will exert all efforts to contribute into achieving the objectives of the National Transition Program (NTP) 2020 and Vision 2030. The agreement was signed by CITC Governor Abdulaziz bin Salem al-Ruwais and Chairman of Zain Saudi Arabia Prince Nayef bin Sultan at the presence of the Minister of Communications and Information Technology Abdullah al-Sawah. Prince Nayef lauded the efforts the communications ministry aiming at achieving NPT 2020 and Vision 2030 goals, confirming Zain's commitment to contribute in reaching those goals. CEO of Zain KSA Sultan bin Abdulazizi al-Deghaither stated that the three high-speed broadband projects for remote areas include providing services to more than 800,000 users in 3,900 villages across 28 districts of each of Riyadh, Eastern Province, Asir Region and Makkah. Deghaither reiterated that Zain KSA had invested heavily in developing its network, which provides high-end technologies during implementation. These projects include the provision of high-speed broadband services to centers, villages and remote areas in various regions of the kingdom by enhancing investment in infrastructure and increasing wireless broadband networks coverage. Projects will also contribute to facilitating use of e-government services in achieving digital transformation. Zain Saudi Arabia stocks rose 5.8 percent on Sunday after the company signed the agreement with CITC. These developments came as CITC launched its index on monitoring the latest developments in information technology and communications sector in the Kingdom by the end of the second quarter of 2017. According to CITC, the number of subscribers to telecommunications services which reached about 43.6 million subscriptions, of which 3.75 million are for postpaid lines, while subscriptions to mobile broadband services on mobile networks reached about 25.2 million. The number of subscriptions to fixed-line broadband services reached 3.2 million, including DSL, fixed wireless connections, fiber optics and other wired lines. As for the number of internet users in Saudi Arabia, CITC said that the number of Internet users in the country reached 24 million users.
(December 12, 2017) aawsat.com

Sri Lanka

In a statement outlining its views on the government's proposed LKR200,000 (USD1,310) per month tax on cellular towers in the 2018 budget, representatives of Sri Lanka's mobile industry have called for the plan to be halted amid concerns it could force operators to close towers in unprofitable areas, discouraging internet coverage expansion – a tenet of the government's IT strategy. In a statement titled 'Mobile Telecommunication Industry View on Proposed Cellular Tower Levy', industry representatives have banded together to argue that the levy will have a detrimental impact on the sector's development. 'If the government persisted with the measure, towers in rural areas could be reduced, eventually slowing down the internet penetration in the country, which is currently at about 38%,' the statement reads. (December 6, 2017) telegeography.com

Tunisia

A re-interpretation of Tunisia's Telecommunications Code has granted state-backed incumbent Tunisie Telecom (TT) greater flexibility to offer multi-play bundles and market fixed broadband services directly to the public. The provider is now permitted to bundle mobile, IPTV, fixed telephony and DSL or fiber-based broadband services and is expected to develop such offerings shortly. Facilitating the move was a re-reading of Tunisia's primary piece of legislation for the sector, the Telecommunications Code, rather than a modification of the legislation or the allocation of a new license. Hichem Besbes, Head of the National Telecommunications Authority (INT) noted: 'According to the former interpretation of the Telecommunications Code, Tunisie Telecom was not able to sell bundled offers including fixed and mobile telephony and fixed and mobile broadband. Before 2011, the operator was [also] banned from marketing fixed internet directly to the general public.' Mr. Besbes stressed, however, that INT would not allow the re-interpretation of the law to give TT an unfair advantage in the market, stating that 'convergent offers which could come into being as a result of this market situation must be replicable.' For its part, TT has said that it will continue to operate under the existing framework for now, offering broadband services via partnerships with other ISPs. In this way, the telco explained it would avoid cannibalizing its user base by indirectly competing with itself.

(December 8, 2017) Tunisie Haut Debit

Tunisie Telecom (TT) has been awarded a contract to deploy 3G/4G networks to so-called white spots (areas that are currently uncovered) by the Ministry of Communication Technology and the Digital Economy (Mincom). The TT was the sole operator to enter a bid for the project, the tender for which was opened in March this year. The rollout forms part of the government's 'Tunisia Digital 2020' strategy, which aims to harness telecommunications and ICT to accelerate the country's socio-economic development. Over the course of the six-phase program TT will deploy wireless infrastructure to provide telephony and data services to a total of 180,000 inhabitants across 112 districts in 15 governorates, including 164 schools and 59 health centers. Access speeds of 4Mbps will be made available to residential subscribers, whilst data transfer rates will initially be 6.5Mbps for schools and hospitals but are scheduled to increase to 8Mbps during the second phase. The government will provide funding totaling TND46 million (USD18.3 million) for the project.

(November 23, 2017) L'Economiste Maghrebin

Turkey

Turkey's mobile internet economy rose 18 percent in 2016 when compared with 2015 -- to reach $26 billion, said a report. The report by Google Turkey and consulting firm OC&C Strategy Consultants said this figure was equivalent to 4 percent of the country's national income in 2016. This figure will climb to 289 billion Turkish liras ($73 billion) in 2023, equivalent to 5.2 percent of Turkey's national income, the report predicted. In 2015 Turkey's mobile internet ecosystem valued 87 billion liras ($22 billion) equivalent to 3.7 percent of the country's national income of that year. Google's mobile operating system Android contributed 54 billion Turkish liras ($13.6 billion) to the 2016 figure, equaling to 2.1 percent of Turkey's national income for the year. The report adds that the Android economy will grow in 2023 and reach 3.5 percent of Turkey's national income. Mobile phone applications play a major role in increasing the number of internet users in Turkey. The mobile phone penetration rate climbed to 94 percent from 2013 to 2016. Mobile and broadband subscribers rose by 23 percent in the same period reaching 62.2 million. The report adds that in 2016, 68 percent mobile phone users had smartphones. Mobile data traffic grew by 92 percent since 2013 and reached 102 million gigabytes in 2016. The growing number of smartphone users contributed to these figures. In 2016, 13 million smartphones were sold in Turkey, the report said, adding that at least 10 million had Android operating systems. Google's Turkey Director Bulent Hicsonmez said Turkey is one of the leading countries in mobile data usage. Elif Koc, an executive of OC&C Strategy Consultants, said that the high number of mobile users in Turkey supports the rise of data subscription.

(November 22, 2017) aa.com.tr

United Arab Emirates

A total of 615 cyber-attacks against government, semi-government and private sector entities in the UAE were foiled in the first 10 months of 2017. The Telecommunications Regulations Authority (TRA) said the largest number of attacks were recorded in January (136), 133 of which targeted government sites in addition to three anti-private sector attacks. The attacks stymied by the TRA's Computer Emergency Readiness Team during Q1 reached 289, accounting for 47 percent of the total so far this year, state news agency WAM reported. It added that February saw 114 attacks, 86 of which targeted private sites and 23 against government departments while a total of 39 attacks were registered in March, 21 of which against private sites and 18 against government ones. The TRA said it has been launching awareness campaigns, including lectures, seminars and workshops to promote cyber safety, calling upon all departments to have back-up data bases independent of the internet. Cyber-attacks seek to deface and block government websites, including denial of service, hacking, deception, fraud, and identity and document theft, it added.

(December 17, 2017) arabianbusiness.com

The Telecommunications Regulatory Authority (TRA) has participated in the 21st session of the Council of Arab Ministers of Communication and Information Technology in Cairo, headed by Egypt. Hamad Obaid Al Mansoori, TRA said that a proposal will be prepared for the establishment of an Arab telecommunications union amidst the technological boom being witnessed in the region. Al Mansoori added that the information and communications technology sector is the most powerful engine in the Arab world. "It has contributed to the development of many regional institutions and structures, and it has a great future," he said. He added that he expected the next session of the meetings of the Arab Ministers of Communications will witness greater attendance as a result of "joint Arab work", especially given the region is approaching an "unprecedented" stage in terms of relying on communications, information technology, large data, Internet of things and other global trends that require preparation systems, administrations and the Arab communications sector. Al Mansoori has previously warned that rapid global changes to the Internet demand new attitudes to the way it is managed. Speaking at the 60th International Public Meeting (ICANN60) of the Internet Corporation for Assigned Names and Numbers (ICANN), he said, "The internet itself is witnessing a historic leap between two times: the time of Internet of human, and the time of Internet of things. According to latest assessments, the number of 'things' connected to the Internet today exceeds 8.4 billion devices. This number is expected to reach more than 20 billion devices in 2020, which poses new challenges to power of data transfer to meet modern requirements." The TRA recently hosted the OpenUAE annual forum for the UAE open source software community in the presence of university students and experts in the field.

(December 5, 2017) tahawultech.com

REGULATORY ACTIVITIES BEYOND THE SAMENA REGION

Angola

The Minister for Telecoms & IT, Jose Carvalho da Rocha, has stated that the government aims to issue an international public tender for a 'fourth telecoms operator' to provide mobile, broadband, fixed line and pay-TV services, in which it intends to take a 45% stake. Further details are expected to be released by the end of this year, and proposals for the tender will be accepted up until February 27, 2018, Lusa news agency reported, adding that the government claims to have already received foreign telecoms investor interest. As reported by Lusa and other Portuguese language news sites including Expresso and RTP, the Angolan government also revealed that it is in the process of privatizing a 45% stake in state-owned fixed network operator Angola Telecom. As previously indicated by regulator INACOM – and now confirmed by the ICT Ministry – Angola Telecom has been designated the country's third 'Unified Global' communications licensee covering all mobile/fixed voice/data/TV services alongside cellcos Unitel and Movicel, under the new converged Electronic Communications framework (entering law in full on 3 October 2017, TeleGeography notes). The Ministry's declaration of a 'fourth operator' tender alongside a part-privatization signifies that the government wants to raise competition and diversify investment in the sector to prevent monopolies. Angola Telecom already owns a minority stake in second-placed mobile player Movicel, whilst Isabel dos Santos, the billionaire daughter of former Angolan president Jose Eduardo dos Santos, controls a 25% stake in market leader Unitel via an investment vehicle; her half-sister Welwitschia dos Santos reportedly owns an indirect stake in Movicel. New president Joao Lourenco, who took office in September, promptly sacked Isabel dos Santos as head of national oil company Sonangol (itself also a 25% Unitel stakeholder via its broadband division MSTelcom) in one of his first high-profile actions. It is yet to be confirmed, meanwhile, if Angola Telecom has been successful in the 4G 800MHz (digital dividend) mobile frequency license auction launched by INACOM in August. In another move aimed at encouraging new entrants, the ICT Minister also stated this week that he will demand operators comply with infrastructure sharing guidelines, under an existing decree that requires all infrastructure capable of hosting ICT services to be shared, for the purposes of reducing investment whilst boosting competition. Elsewhere, the launch of the first Angolan satellite, AngoSat-1, has reportedly been rescheduled from December 7 to December 26, 2017. Angolan satellite services operator Infrasat, part-owned by Angola Telecom, has already sold 65% of Ku-band capacity of the new orbiter.
(November 29, 2017) Lusa News Agency

Australia

The government has announced a program of work to implement a new Universal Service Guarantee (USG), which it claims 'will ensure all Australians have access to voice and broadband services, regardless of where they live'. As part of the development of the new USG, it has been confirmed that the existing Universal Service Obligation (USO) contract related to fixed voice services with Telstra will remain in place until replaced with a USG, following the completion of the National Broadband Network (NBN) rollout in 2020. The decision to develop the USG, it was noted, comes following the Productivity Commission inquiry into the USO, which found the existing contract to be 'anachronistic and costly' and argued it should be 'replaced by a new framework to reflect changing policy, market and technological realities'. However, it has been noted that, before any changes to the existing USO are made, several requirements must be fulfilled, namely: that broadband services are available to 100% of Australian premises, on request, at the completion of the NBN rollout in 2020; that voice services are available to 100% of premises on request; that any proposed new service delivery arrangements are more cost effective than the existing USO contract (including any transitional costs); and that a new consumer safeguards framework is in place following a review and associated public consultation process. Commenting on the matter, Australian communications minister Mitch Fifield stated: 'The government is taking a 'belt and braces' approach to protecting telecommunications accessibility for people in regional Australia … The government is putting new, stronger safeguards in place before making any changes to existing safeguards while the NBN is rolled out.' *(December 22, 2017) telegeography.com*

A total of five companies secured frequencies in the multiband residual lots auction carried out by the Australian Communications and Media Authority (ACMA), it has confirmed. With the regulator revealing that the sale process reached its conclusion on December 12, it named Telstra, Optus, Vodafone Australia, TPG Telecom and nbn as the winning bidders. Telstra emerged as the biggest spender by some margin, agreeing to pay a total of AUD72.53 million (USD55 million) for frequencies in the

1800MHz, 2100MHz, 2.3GHz and 3.4GHz bands. Vodafone committed to paying a total of AUD7.24 million for its new spectrum, which again was spread across all four aforementioned bands, while Optus bid a combined AUD6.51 million for 2.3GHz and 3.4GHz frequencies. Rounding out the winners, nbn, the company overseeing Australia's National Broadband Network (NBN) rollout, secured 2.3GHz and 3.4GHz spectrum at a cost of AUD4.01 million, with TPG the smallest spender, bidding AUD2.33 million for 1800MHz frequencies only. Meanwhile, the ACMA noted that a further six lots were not offered at auction, as only one unnamed applicant had expressed an interest in these lots. As such, the regulator has said it will offer these to that applicant for a pre-determined price, that being the starting bid price. Commenting on the auction process, ACMA Chairperson Nerida O'Loughlin said: 'There was good competition across the 1800MHz, [2100MHz], 2.3GHz and 3.4GHz bands. The additional spectrum will mean improved services and greater choice for consumers in those areas where lots have been allocated.' (December 14, 2017) telegeography.com

Australia opened the first round of a spectrum auction to sell 39 lots of airwaves across four bands, with the majority of lots available in areas outside of major cities. The Australian Communications and Media Authority (ACMA) announced the auction covers spectrum which remained unallocated after its 2015 sale in the 1.8GHz band, along with airwaves in the 2GHz, 2.3GHz and 3.4GHz bands. ACMA first announced plans for the move in early October, calling for interested parties to submit applications by October 27 and explaining the auction would be run in three stages. Stages two and three will be scheduled following the completion of the first. ACMA Chair Nerida O'Loughlin said she expects the spectrum will be used for mobile or wireless broadband services, but noted ACMA also "built flexibility into the technical frameworks for each band, allowing for other uses as well". Starting prices of the lots differ widely, from a high of AUD5.74 million (US$4.34 million) for 2x5MHz of 2GHz spectrum in Brisbane to AUD1,000 for 28MHz of 2.3GHz spectrum in Gold Field, which has a population of just over 1,000. The ACMA will use simple clock auction (SCA) process, which it said combines the advantages of an English open outcry (EOO) auction with additional capabilities enabled by an electronic implementation, reducing the risk of bidders signaling their intentions during the auction. An SCA is similar to an EOO auction, where all lots may be simultaneously open for bidding in a simple ascending-bid process. (November 28, 2017) mobileworldlive.com

Austria

The Ministry for Transport, Innovation and Technology has revealed that it has so far allocated EUR332 million (USD395.8 million) in broadband subsidies, benefiting around 681,000 residents across 1,104 municipalities. The sum is around a third of the total scheduled to be awarded by 2020 under the government broadband expansion program. Among the federal states, Lower Austria has so far secured the most funding with EUR94.3 million for 230 municipalities, benefiting 176,700 residents, followed by Upper Austria, which has been allocated EUR89.2 million to benefit 134,400 residents in 248 municipalities. The Breitband Austria 2020 national broadband strategy aims to achieve nationwide NGN internet access by 2020. In the form of subsidies, the government plans to make EUR1 billion available for NGN deployment in rural areas, generated from the multi-band mobile spectrum auction, which was concluded in October 2013. Austria plans to provide next generation broadband access to 1.9 million homes identified as having internet speeds lower than 30Mbps. (November 28, 2017) telegeography.com

Benin

The Regulatory Authority for Electronic Communications & Postal Services (ARCEP) has withdrawn the operating license of Nigerian-owned Globacom Benin (Glo Mobile), after negotiations between the two sides broke down over the concession's renewal terms, Reuters writes. According to unnamed sources, the company refused to accept a number of new conditions imposed by the regulator, including an increase of the license fee. The government of the Republic of Benin issued a decision on September 20 rejecting Glo's proposed terms to renew its authorization. Glo's operating license expired on August 19, and the government had previously set prerequisite renewal conditions including payment of all of Glo's arrears (frequency usage fees and others, totaling nearly XOF13 billion [USD23.6 million]), whilst Glo had pledged to make certain investments, seeking various exemptions in return.
(December 21, 2017) telegeography.com

Brazil

The National Telecommunications Agency (ANATEL) has rejected a petition by Societe Mondiale, a shareholder in Oi, to stop US hedge fund Aurelius Capital Management from inking a debt restructuring agreement with the stricken telco. In doing so, however, the watchdog has agreed to open an inquiry into claims made by Societe Mondiale that Aurelius' maneuvers could see it breach local antitrust rules. Societe Mondiale has alleged that Aurelius holds a 17% stake in rival mobile operator Nextel Brasil, through intermediaries. A source close to the hedge fund has asserted that the Nextel stake is closer to 6%. Oi filed the largest bankruptcy request in Brazil's history in June 2016, after failing to reach an agreement with creditors. The filing, which covered Oi and six subsidiaries, listed BRL65.4 billion (USD20.2 billion) of debt and the company chose judicial reorganization to preserve the value of its holdings and to continue providing services to its customers. Both China Telecom and China Mobile have been linked with a buyout of Oi in recent months.
(December 7, 2017) reuters.com

The National Telecommunications Agency (ANATEL) is set to authorize spectrum in the 2300MHz-2400MHz band for mobile use, TeleSintese reports, citing a recent resolution – Resolucao No. 688 – which concerns the 'allocation and conditions of use of radio frequencies'. As per the resolution, the spectrum will be revoked from Auxiliary Broadcasting and Related Services (SARC) and replay TV (RpTV) license holders. The report quotes Agostinho Linhares, Anatel's frequency licensing Manager, as saying that the spectrum band is already harmonized around the world for International Mobile Telecommunications (IMT) services, and there are already more than 2,700 models of mobile handset that are compatible with spectrum in this range. According to the executive, the introduction of the 2300MHz-2400MHz band means that mobile operators in Brazil now have 997MHz of bandwidth at their collective disposal.
(November 28, 2017) TeleSintese

China

China had 1.41 billion subscribers of mobile communication services as of November 2017, increasing 0.48% sequentially and 6.86% on year, and 139.12 million (9.87%) of them were 3G users, 973.32 million (69.02%) 4G users and 1.252 billion (88.81%) mobile Internet-access users, according to China's

Ministry of Industry and Information Technology (MIIT). During the month, mobile communication subscribers sent 60.05 billion messages, or an average of 1.42 messages per phone number per day; and mobile access to the Internet resulted in total traffic of 2,984,204Tb. (December 26, 2017) samenacouncil.org

Congo Republic

A new campaign seeking to identify mobile subscribers in the Republic of the Congo has been launched by the Agence de Regulation des Postes et Communications (ARPCE. The development comes amid suggestions that the number of SIM cards in the country that are being used fraudulently remains high, with ARPCE director general Yves Castanou cited as saying that some half a dozen illegal networks have been shut down this year alone. With the executive having also sought to remind local cellcos of their obligation to make sure that identification process for subscribes are correctly followed, the authorities have indicated that action could be taken against any company deemed to not have met their obligations. In May 2010 Decree No.2010-554 introduced a requirement

for mobile operators in the Republic of the Congo to register all subscribers from 1 January 2011, a move the state argued would help fight crime and terrorism. At the start of October 2011 the ARPCE announced the closure of a campaign aimed at registering mobile subscriber data, with 92% of customers said to have handed over their details by September 30, 2011, up from the 82% three months earlier. All cellcos were given seven days to integrate subscriber data into their respective databases, while from October 7, 2011 those customers that had not provided their details were no longer be able to make outgoing calls, before access was completely suspended on October 21.
(December 5, 2017) Agence Ecofin

France

ARCEP has set the regulatory framework that will governs how Orange will roll out fiber services and access after more than a year of consultation and development. The French regulator has defined the asymmetric regulation that applies to Orange for three key broadband and superfast broadband markets: wholesale local access provided at a fixed location, wholesale central access provided at a fixed location for mass-market products, and wholesale

high-quality access provided at a fixed location. The structural decisions, which come after months of consultation with both the French incumbent and its rivals, will shape regulation for the next three years with the aim of accelerating fiber deployments in France. In an interview with GTBlast year, ARCEP head Sebastien Soriano warned that France was falling behind the rest Europe in the deployment of fiber, and said the country needed to speed-up rollouts

to keep up with the European Commission's Gigabit Society plan. ARCEP said: "Changes to the regulatory framework will enable more fluid rollout processes thanks to a more streamlined civil engineering offer from Orange, in addition to making alternative operators more autonomous and improving the indicators used to monitor quality of service, and so to be able to prevent any deterioration of the network." Orange has proposed changes that it hopes will address operational difficulties its competitor have found when marketing their own fiber products, with the regulator finding these changes satisfactory enough that it will not immediately introduce specific obligations on the incumbent. Soriano said: "ARCEP has thus put a pragmatic approach on the table. Of course, if it does not work ARCEP could employ methods that will be more stringent for Orange, imposing an obligation of means and no longer of results." ARCEP has imposed new obligations on Orange when it comes to the business market, however, as it looks to "democratize optical fiber access in micro, small and medium enterprises". Orange currently dominates this market. The new measures will include imposing an obligation on Orange to allow rival service providers to re-sell its products to the enterprise market. It will also see controls placed on wholesale offers for businesses, to avoid "excessive" and "predatory pricing". Soriano added: "We have high ambitions for the business market. We will therefore keep a very close eye on these developments. Here, the first half of 2018 will be critical, and we hope to see a change in model

with the arrival of wholesale market players who are capable of bolstering competition in the fiber market for businesses." (December 17, 2017) globaltelecomsbusiness.com

The telecoms watchdog the Authority of Regulation for Electronic Communications and Posts (ARCEP) has published final details of the frequency allocation process for spectrum in the 3410MHz-3460MHz range. The spectrum has been earmarked for fixed-wireless services, to provide high-speed broadband access to customers in areas that will not be served by fiber networks for the foreseeable future. The licensees will be required to provide downlink/uplink speeds of at least 30Mbps/5Mbps 95% of the time, with retail offerings to include options with no download cap. In terms of coverage obligations, license holders will also be required to offer – directly or indirectly – broadband services to 90% of the households within its license area within 18 months, rising to 100% by January 1, 2022. Further, the operator is required to begin using the frequencies within twelve months of the license allocation. Arcep will accept applications for the licenses from early 2018 until December 31, 2019. The concessions will be issued on a departmental basis, with the regulator noting that the available spectrum differs slightly from department to department; in some cases, existing spectrum allocations will limit the new licenses to a single 20MHz (TDD) or a 2×10MHz (FDD) block. Arcep opened a public consultation on the allocation process in July this year, which ran until early September. (December 12, 2017) telegeography.com

Ghana

Communications Minister Ursula Owusu Ekuful has announced that the Ghanaian government will review its 2012 broadband policy in 2018 to enhance connectivity across the country. The Minister said that the government believes working together with operators to create an infrastructure sharing code and facility that makes it easier for telcos to extend their services will stimulate competition between firms based on the quality of their services rather than on coverage. The Broadband Communication Chamber Forum has been set up by the government and seeks to initiate a public dialogue on how to revamp Ghana's 2012 broadband policy. Next year the current policy will undergo a full review, taking into account new entrants to the country's broadband market, infrastructure, as well as broadband penetration targets. (December 15, 2017) The Business Day Ghana

Mrs. Ursula Owusu Ekuful, the Minister of Communications, has called on broadband and telecom companies to build up a broadband infrastructure code to allow for the co-sharing of broadband infrastructure. She said co-sharing infrastructure would help reduce the overhead cost of broadband firms and telcos and thereby lower the cost of internet. Mrs. Ekuful made the call at

the opening of the maiden Broadband Ghana Forum in Accra. Ghana is hosting the first ever Broadband Forum, organized by the Broadband Communications Chamber (BBCC) in partnership with the Ministry of Communications, to initiate a public dialogue on how to revamp the country's five year old broadband policy and to give proper direction to its Digital Agenda. The event, being held under the theme: 'Broadband - The Catalyst for Sustainable Socio-Economic Development,' discussed issues such as Challenges and Barriers to creating a fully digitally enabled country, advancing digital capacity and capabilities and helping to develop effective telecommunication policies to meet the needs of the underserved and unserved areas and best practice models that are proving successful elsewhere in the developing world. Mrs. Ekuful said there were many fiber optic cables deployed by some individual broadband companies, telcos and ISPs which are not being co-shared and called on the players to mutually discuss how to co-share the infrastructure. She said: "We have a lot of metro fiber around the large cities while major parts of this country are not covered. We can't continue this way. It is very expensive to lay fiber, so if we sit down in a room to decide that okay there is enough fiber here. We all want to extend our service to

another location". "Let us join our resources instead of everybody laying down fiber to extend services. Let's decide that company A will do point A to point B. Company B will continue from point B to point C. Or an infrastructure company set up not to provide the services but to lay down the infrastructure, will lay down the fiber and everybody will lease capacity to do their work". Mrs. Ekuful said the companies would in the long run benefit from a reduction in capital expenditure as they would not need to invest so much in building their own fiber network but can lease capacity from infrastructure companies to extend their services. By sharing the cost of laying down the necessary infrastructure and pooling our resources together we can ensure that every part of this country is connected instead of the small geographical locations we have now, the Minister said.
(December 3, 2017) ghananewsagency.org

Greece

Reports from Greece suggest that local telcos Wind Hellas and Vodafone are still in the race to acquire smaller rival Cyta Hellas which has been put up for sale by its Cypriot parent company. Kathimerini writes that a third interested party – PCCW of Hong Kong – appears not to have submitted a bid, with Wind now the favorite to acquire Cyta's Greek business. Launched in 2007, Cyta Hellas has soaked up investment of around EUR160 million (USD188 million) without ever turning a profit.
(December 21, 2017) telegeography.com

Hong Kong

Hong Kong issued its first public wireless IoT license after the Communications Authority (CA) recently created a licensing regime for wireless IoT services using the shared 920MHz to 925MHz frequency band. CA said the move was taken to prepare Hong Kong to embrace the new era of IoT and 5G services, along with various smart city applications. A CA representative said: "With the emergence of new generations of wireless and mobile technologies, massive implementation of IoT will become the trend. Hong Kong must prepare itself to keep up with this global trend. The CA decided to establish a new licensing regime to respond to the market development and the industry's requests in a timely manner." Both Thinxtra, a provider of low power wide area (LPWA) networks based on Sigfox technology, and Pixel Networks, a Hong Kong-based LoRa network provider, claimed to be the first to receive a wireless IoT license in the territory. Thinxtra said in a statement its network covers more than 30 per cent of the population in Hong Kong. It expects to deploy a total of 100 base stations in the territory by June 2018, providing fully redundant coverage to 95 per cent of the population. It is the exclusive Hong Kong network operator of Sigfox. The company said devices on its network can be connected for as little as HKD20 (US$2.56) a year, with a battery life of up to ten years. Pixel is focused on IoT applications including automated utility meters, smart lighting, and tracking systems for people and luggage. The wireless IoT licenses are valid for five years and, subject to the discretion of the CA, may be extended for a further period of up to five years. The annual license fee consists of a fixed fee of HKD100,000 and variable charges based on the number of base stations and wireless IoT devices in use. Sigfox and LoRa LPWA technologies typically use unlicensed spectrum, unlike 3GPP-standardised LPWA technologies NB-IoT, EC-GSM-IOT and LTE-M.
(December 13, 2017) mobileworldlive.com

The Office of the Communications Authority (OFCA) plans to work to ensure the market is one of the world's earliest adopters of 5G technology. Legislative councilor for IT Charles Mok told the South China Morning Post that commercial 5G networks are expected to be launched in Hong Kong in 2020. While OFCA has faced criticism for not doing enough to prepare for the arrival of 5G, including the lack of a clear spectrum roadmap, Mok said the ITU will first need to decide on the global allocation of 5G spectrum during the planned World Radiocommunication Conference in 2019. This conference is expected to be a mere formality with the industry already having a strong idea of the likely radiofrequencies to be allocated for 5G. OFCA has separately set up a licensing scheme for companies seeking to use wireless bands for IoT devices in a bid to give the government regulatory oversight of IoT products and services such as smart meters, smart waste systems and autonomous vehicles. Two unnamed international companies have already applied for such a license, OFCA said, but did not disclose the names of the companies.
(December 5, 2017) telecomasia.net

India

The Department of Telecommunications (DoT) has granted approval for the transfer of Tikona Digital Networks' (TDN's) 2300MHz spectrum in Rajasthan to Bharti Airtel, following the latter's acquisition of TDN's 4G division earlier this year. The Economic Times writes that TDN was issued a fine of INR24 million (USD376,570) by the DoT for failing to meet its rollout requirements in the circle in time: under the terms of its license TDN was obliged to begin offering services in Rajasthan by November 2015, but missed this target by three months, commercially launching in February 2016. Following the payment of the fine in October this year, the DoT has now given TDN clearance to transfer the frequencies to Airtel. Airtel completed its acquisition of the rest of TDN's 4G operations in August this year.
(December 4, 2017) telegeography.com

The Telecom Regulatory Authority of India (TRAI) has published its recommendations on Net Neutrality, supporting the strengthening of rules to prevent discrimination in internet access. The watchdog's recommendations to the Department of Telecommunications (DoT) advise the amplification of licensing terms to provide 'explicit restrictions on any sort of discrimination of internet access based on the content being accessed, the protocols being used or the user equipment being deployed'. The regulator clarified that its broad definition of 'content' covered all content, applications, services and data that can be accessed over the internet. The TRAI's paper goes on to specify that 'discriminatory treatment' includes practices such as blocking, slowing down or granting preferential speeds or treatment to any content. The recommendations do allow for ISPs to offer so-called 'specialized services' which are optimized for specific content, protocols or user equipment, where optimization is necessary to meet quality of service requirements. Crucially, however, the watchdog made it clear that specialized services may be offered by a provider only if they are not usable or offered as a replacement for internet access services, and under the condition that the provision of specialized services is not detrimental to the availability or quality of internet access services. The caveat looks to enable ISPs to cater to specific niches and offer highly specialized offerings, without opening a loophole for providers to circumvent other restrictions. Similarly, the TRAI recommends that traffic management measures be permitted provided that they are 'proportionate, transient and transparent'. To that end, ISPs would be required to declare their traffic management practices

(TMPs), including what measures they plan to use, under what circumstances they will be implemented and the impact that they will have on customers. Monitoring and investigation of violations should be handled by a collaborative mechanism in the form of a multi-stakeholder body, drawing from the industry, as well as content providers, academia, civil society organizations and consumer representatives, the TRAI recommended. (November 28, 2017) telegeography.com

India's largest wireless provider by subscribers, Bharti Airtel, is open to acquisition talks with sixth-placed Aircel after the latter's planned merger with Reliance Communications (RCOM) collapsed earlier this year. In an interview with the Economic Times, Airtel Chairman Sunil Mittal said of a potential Aircel takeover: 'I think for [Aircel], it's only the Vodafone-Idea combination or us. Whenever there will be a possibility of a conversation, I have no doubt we will be a part of that conversation.' Vodafone and Idea Cellular, India's second and third largest cellcos, respectively, are also currently in the process of merging their operations. In a separate development, Airtel confirmed late last week that it was interested in acquiring some of the assets being put up for sale by RCOM's lenders. RCOM's creditors are looking to offload the operator's fiber, towers and spectrum, to reclaim some of the company's INR450 billion (USD7 billion) debt burden as it exits the wireless market. Regarding the potential acquisition by Airtel of the RCOM assets, a spokesperson for the telco stated: 'We have expressed our interest only in buying select spectrum and some equipment.' Commenting on recent market developments, Mr. Mittal attributed the recent push for consolidation to the price war sparked by Reliance Jio Infocomm (Jio) in September last year. Whilst the chairman acknowledged that Airtel had benefited from the consolidation, Mr. Mittal was critical of Jio's practices – and the government's response – claiming that the newcomer's aggressive pricing and promotional period put additional pressure on already-struggling providers such as RCOM and Tata Teleservices Limited (TTSL). 'My estimate is about USD40 billion-USD50 billion has been written off by various companies, many of whom are international investors. It is largely due to Jio … [and its] pricing. Having such a long, free promotional period, and in some sense decided by laws of the land in their favor, is unheard of. In my opinion, in Europe or the US this would have been stopped. It would have been seen as predatory.'
(November 27, 2017) telegeography.com

Italy

The government has approved a measure which will introduce a 6% 'web tax' on the sale of digital services such as online advertising. The move is expected to raise around EUR114 million (USD135 million) a year when it comes into force in January 2019. The new levy is aimed at internet giants such as Google and Facebook who receive income from web services in

Italy but who choose to pay taxes in countries with a more favorable tax regime. Further details of the new system are due to be released next year. Italy is one of the first nations to look at taxing internet firms in such a way. Earlier this year Google agreed to pay EUR306 million in back taxes to the Italian government after a dispute over its financial arrangements in the country.
(November 28, 2017) telegeography.com

The Communications Regulatory Authority (Agcom) has opened a consultation into a possible extension of spectrum rights in the 3.5GHz band which are due to expire in 2023. 15-year licenses were won in 2008 by Tiscali unit Aria, Retelit/E-via (now GO internet), Linkem and Telecom Italia (TIM), and the spectrum is currently used for wireless broadband networks based on a technologies such as WiMAX and TD-LTE. Italy's Ministry of Economic Development has asked Agcom to study the possible extension of the licenses, including the regulatory framework and spectrum fees. (November 20, 2017) telegeography.com

Japan

The Ministry of Internal Affairs and Communications (MIC) in Japan will revise its spectrum allocation process in a bid to encourage new players to enter the country's 5G market in the coming years. With the big three cellcos – NTT DOCOMO, SoftBank and KDDI gearing up to launch nationwide fifth generation service by the 2020 Tokyo Olympics, the government is keen to introduce competition from new players in the hope that it will drive down charges in Japan, where mobile call plans currently cost more than in many other countries. The Ministry is understood to be sitting on a new report compiled by a government panel on regulatory reform, that is eyeing new ways of bidding for spectrum to increase transparency regarding how it is awarded and adopt what will likely look close to competitive bidding. In the past, the bid process has drawn criticism for what some say has been a 'behind closed doors' selection method in which the powerful ministry has been left free to 'exercise broad discretion' on the outcome of any tender. The Nikkei notes that out of the 35 countries in the Organization for Economic Cooperation and Development (OECD), only Japan does not auction off bandwidth via competitive price bidding. 'The ministry will introduce some features of these spectrum auctions under a new framework,' it says. Spectrum may go to even non-telecom companies with advanced technological capabilities and strong finances. Many businesses are expected to seek entry into 5G service, which will likely be used for IoT, virtual reality and automated driving in addition to smartphones. The details of the new tender are expected to be finalized in the coming year (i.e. fiscal year starting April 2018) and the MIC aims to submit a proposal to amend relevant legislation in 2019. (November 28, 2017) The Nikkei Asian Review

Latvia

The telecoms watchdog the Public Utilities Commission (SPRK) has announced the results of its November spectrum auction for frequencies in the 3400MHz-3800MHz range, which the regulator has made available for the provision of 5G services. Latvijas Mobilais Telefons (LMT) was the only participant in the tender and secured the two 50MHz blocks that were put up for sale – at 3400MHz-3450MHz and 3650MHz-3700MHz – for the reserve price of EUR250,000 (USD294,210) apiece. The concessions are valid for ten years, from January 1, 2019 to December 31, 2028. (December 11, 2017) telegeography.com

Malta

The Malta Communications Authority (MCA) says it has received expressions of interest from four companies looking to attain rights to use wireless broadband spectrum. Incumbent trio GO, Vodafone and Melita, plus start-up firm mob5G.net Malta are interested in acquiring frequencies in the 800MHz and 2500MHz bands, while Melita has also shown an interest in securing 1800MHz spectrum. The regulator says the demand for frequencies outstrips the availability in the respective bands. It will now issue a Call for Applications and is inviting all respondents to take part in the process. (December 1, 2017) telegeography.com

Mexico

The telecom regulatory authority, Federal Telecommunications Institute (IFT), recently confirmed that it will start the auction process of the 2.5 GHz (2500-2690 MHz) wireless frequency band before March 2018. The auction process was deferred thrice due to the bidding schedule for 4G LTE shared wireless network, using 90 MHz of spectrum within the 700 MHz-band. Notably, wireless spectrums of 2.5 GHz band are highly suitable for the deployment of 4G LTE networks. The IFT has decided to auction a total of 120MHz spectrums on the 2.5GHz band in six blocks of 20MHz each. This includes four for FDD-LTE services and two for TDD-LTE. The concessions will be for 20 years and the minimum value of each block will be MXN 350 million. Moreover, another 10 MHz will be reserved as "guard band" spectrum. Meanwhile, Mexican telecom behemoth America Movil SAB AMX is aggressively being resisted by its rivals from taking part in the upcoming 2.5 GHz wireless spectrum auction. Notably, in July 2017, America Movil, the undisputed leader of the Mexican telecom market, purchased 60 MHz of wireless spectrum in the 2.5 GHz band from Grupo MVS. For the last couple of years, America Movil has been systematically enriching its

spectrum portfolio. In June 2016, the IFT granted concessions for the 1710-1780 MHz/2110-2180 MHz AWS frequency bands to America Movil and AT&T Inc. On Feb 15, 2016, the IFT opened an auction for 80 MHz of wireless spectrum across various Advanced Wireless Services (AWS) bands. America Movil and AT&T emerged winners of the spectrum auction. Given this scenario, America Movil's rivals, namely, Telefonica SA TEF, AT&T, Totalplay, Cablevision and Axtel have pointed out to the IFT that the company should be banned from taking part in the 2.5 GHz spectrum auction, or it will lead to excessive spectrum going into the hands of a particular wireless operator which controls almost 70% of the Mexican wireless space. In 2014, the government of Mexico introduced some major reforms within its telecom sector. Per the IFT norms, the maximum hold of a company in any specific market has been restricted to 50%. However, about 68% and 70% of telecom space is controlled by America Movil's wireline and wireless divisions, respectively. This has induced IFT to identify the company as a dominant player and has imposed stringent regulations on it. Another incumbent telecom operator, Telefonica, holds nearly 20% market share. In 2015, U.S. telecom behemoth AT&T entered the Mexican telecom industry after acquiring Grupo

Iusacell and Nextel de Mexico. Additionally, Mexican cable MSO (multi service operator) Grupo Televisa S.A. TV, has also received a go-ahead from the IFT to enter the wireless space. However, the company is yet to take any decision in this regard. Mexico is the largest economy in the Latin American region, with a growing middle class population that is eager to spend more on high-speed wireless networks for optimal use of smartphones and tablets. Also the wireless penetration rate is relatively lower in the country compared with that in the United States. We, therefore, expect increased competition in this market. AT&T, Telefonica and Televisa currently carry a Zacks Rank #4 (Sell), while America Movil carries a Zacks Rank #3 (Hold). You can see the complete list of today's Zacks #1 Rank (Strong Buy) stocks here. Here's another stock idea to consider. Much like petroleum 150 years ago, lithium power may soon shake the world, creating millionaires and reshaping geo-politics. Soon electric vehicles (EVs) may be cheaper than gas guzzlers. Some are already reaching 265 miles on a single charge. With battery prices plummeting and charging stations set to multiply, one company stands out as the #1 stock to buy according to Zacks research.
(December 14, 2017) nasdaq.com

Netherlands

In 2018 the government of the Netherlands will evaluate the potential for opening up the 3.5GHz frequency range to mobile services, reports Dutch-based Telecompaper, quoting a brief to parliament from the State Secretary at the Ministry of Economic Affairs & Climate Policy, Mona Keijzer, concerning the upcoming EU telecom council in December. The 3.5GHz band in the north of the country is restricted to military usage, and Keijzer's ministry will consult with

the defense ministry over alternatives for the military satellite ground station located in Burum, Friesland, currently using the frequencies. However, as a further obstacle to freeing up 3.5GHz spectrum – one of the key bands earmarked for 5G New Radio (NR) mobile services – regional licenses covering southern areas have been distributed to small companies, valid until September 2026.
(November 24, 2017) telegeography.com

Nigeria

The Nigerian Communications Commission (NCC) has carefully developed a monitoring and compliance plan effective this last quarter of 2017 to periodically conduct stress tests on its telecommunications licensees in order to ascertain their viability as going concerns under the extant laws of Nigeria. The stress test is in line with the mandatory implementation of the Code of Corporate Governance which the Commission has championed in the last three years to help it entrench corporate governance and sustainability principles, while promoting inter-generational equity in the conduct of telecoms business. Chairman, Board of NCC, Senator Olabiyi Durojaiye told LEADERSHIP at the weekend that the Commission under the current administration "would not like to witness the folding up of any of our major telecoms service providers whom we regard as the geese that lay the golden eggs for our country." He said by putting in place the monitoring and compliance mechanism, "it is important to

reiterate at this point that the essence of the exercise is not to ambush and sanction erring licensees, but to encourage willful and deliberate compliance with the principles of the Code. To this end, the Commission has instituted a reward system, which is aimed at recognizing and celebrating compliant licensees." The mandatory compliance framework was introduced amidst a receding economy triggered off by a combination of factors such as falling oil prices, embarrassing public and private sector corruption, huge internal and external debts, weak income per capita/per head, excess of imports over exports resulting in adverse balance of trade and of international payment, huge expenses in combating and refurbishing Boko Haram damages in the North-East and infrastructural deficit and restiveness in the Niger Delta. Durojaiye said by July 2016 inflationary pressures, spiked by successive negative growth in the Gross Domestic Product (GDP), effectively slipped the economy into recession. At the telecoms

industry level, the picture was not any better. "A closer examination showed that the industry was dealing with gradual and steady decline in Year-on-Year Gross Earnings, Average Revenue Per User (ARPU), particularly in the voice segment of the market, occasioned by the ubiquitous and predatory new media (Over the Top (OTT) providers), poor Quality of Service indices, as well as rising debt/expenditure profile. All of these combined to foist an oppressive operating environment on industry players" he said. The introduction of the Code was designed to address this yawning gap. According to experts, the events of the recent past in the industry such as the failed takeover of Etisalat Nigeria (now 9Mobile) by 13 lender banks, underscore the urgent need for stakeholders to implement the time-tested governance principles in the conduct of their businesses. From deliberate violation of licence conditions to serial breaches of contractual obligations, the industry has never been this threatened, the experts said. Speaking further, Durojaiye said "the industry is on a threshold, and requires a paradigm shift from the traditional corporate governance principles of Board/Management strategic initiatives, stakeholder satisfaction and financial auditing to a more robust enterprise risk management framework that speaks to value propositions such as reputation, quality and quantity of human capital, protection of human and labor rights, among others." Meanwhile, Executive Vice Chairman, Nigerian Communications Commission (NCC), Professor Umaru Danbatta has averred that to sustain business confidence and faith in the service providers to provide seamless services to their customers, it is expedient that telecoms sector operators comply with this Code of Corporate Governance. "Whereas the code prescribes sanctions for non-compliance but the code also contains reward system for consistent compliance indicating that enforcement and sanctions is not the raisond'état for promulgating the code. To promote that stakeholders' concept the code encourages companies who meet the prescribed parameters in terms of operational size and to leverage inherent investment and capital access enlist on the Stock Exchange" he added. "It bears reiterating that though most high profile sector operators are privately owned, but the general public and society have very

high stakes in them and thus justifies the application of the code. "The unfolding challenges of Etisalat now renamed 9Mobile being a good example of that relevance, NCC has a duty to protect all parties. The House of Representatives of Nigeria disclosed that the sector was owing about N143 billion in taxes to government. "Without prejudice to the sanctity of the ball pack sum quoted, the fact that such huge sum could be owed say a lot about the standard of corporate governance in our sector. Better disclosure policy would in our opinion not allow such huge debt to accumulate" he said, adding that SIM registration difficulties NCC is having with operators could be addressed with strict compliance the code. (November 21, 2017) sundiatapost.com

Ten of the sixteen firms that submitted expressions of interest (EoIs) for acquiring Nigerian wireless operator 9mobile, which was known as Etisalat Nigeria until July this year, have advanced to the next stage. Local newspaper This Day cites sources as saying that financial advisor Barclays has allegedly prequalified ten companies to proceed to the financial bid stage of the process, namely: second largest cellco Globacom; Bharti Airtel, the Indian parent of third-placed Airtel Nigeria; Dangote Group's telecoms business unit, Alheri Engineering; pan-African LTE operator Smile Telecoms Holdings; infrastructure company Helios Towers; Centricus Capital with Africell, a subsidiary of Lebanon-based Lintel Group; Dubai-based private equity firm Abraaj Capital; Teleology Holdings Limited; pan-African investment firm Africa Capital Alliance (ACA); and The Carlyle Group from the US. According to the report, the companies will be required to submit bid bonds of USD150 million each as part of the financial bid process. The lenders of 9mobile have hired Barclays to find new investors for the country's fourth largest cellco by subscribers. Then known as Etisalat Nigeria, the firm defaulted on a USD1.2 billion loan with a consortium of 13 local banks earlier this year. Etisalat Group of the United Arab Emirates (UAE) handed over its 45% stake to the security trustee of the firm's lenders and terminated its existing management and technical support agreements with the cellco. Lenders have delayed taking provisions on the debt and agreed to extend the loan pending the sale to new investors. (November 20, 2017) telegeography.com

Norway

The National Communications Authority (Nkom) has announced that the government has agreed with its recommendation that spectrum in the 700MHz band should be made available to commercial mobile network operators. In line with this, the Nkom has confirmed that it is continuing to prepare for the assignment of 2×30MHz of spectrum in the aforementioned band, with it now set to carry out a public consultation which covers topics such as

the auction format, frequency caps and minimum prices. The regulator expects to have established the overarching regulation for the 700MHz sale process by mid-2018, following which it will conduct a further consultation on detailed rules for the spectrum allocation in H2 2018; with this expected to last between five and six months, the regulator then envisages it will need a further two to three months of preparation before launching the auction itself. (December 12, 2017) telegeography.com

Paraguay

The National Telecommunications Council (CONATEL) has confirmed that three of the country's four mobile operators – Claro, Tigo and Personal – have pre-qualified for the award of 700MHz spectrum, Ultima Hora writes. As the trio have all submitted equal bids for the same sub-band, the regulator will now hold an auction for the block, with the tender scheduled to be held in early 2018. CONATEL's president Teresita Palacios highlighted: 'This is something historic for CONATEL because there was never an auction, that's why we are very attentive to this event.' CONATEL offered seven 2×5MHz paired frequency blocks for sale with a reserve price of USD12 million each. The spectrum blocks have been divided as follows:

Block C: 713MHz-718MHz/768MHz-773MHz
Block D: 718MHz-723MHz/773MHz-778MHz
Block E: 723MHz-728MHz/778MHz-783MHz
Block F: 728MHz-733MHz/783MHz-788MHz
Block G: 733MHz-738MHz/788MHz-793MHz
Block H: 738MHz-743MHz/793MHz-798MHz
Block I: 743MHz-748MHz/798MHz-803MHz.
The watchdog stipulated a 700MHz spectrum cap of 40MHz (2×20MHz) for all participating companies, while CONATEL's president noted that winning bidders will be expected to extend services to underserved rural areas – initially in Alto Parana, Itapua, Caaguazu and Amambay – via the construction of new telecentres, as part of the licensing conditions. (December 19, 2017) telegeography.com

Peru

The telecoms regulator, the Supervisory Agency for Private Investment in Telecommunications (Osiptel), has lifted its temporary ban on the sale of 'unlimited' mobile data plans. Earlier this month Osiptel suspended the sale of the plans introduced in October/November this year, over concerns that cellcos had violated regulations by failing to provide clear and concise information on the plans to customers. In lifting its temporary ban, Osiptel notes that the companies affected by the order – Movistar, Entel, Claro and Bitel – have now clarified the terms and conditions of their plans, including specifying conditions for download speed reductions once consumers reach a certain threshold of data use. Details of other restrictions on the plans, such as on video quality, have now also been made clearer and more easily accessible to consumers, the regulator noted. (November 27, 2017) telegeography.com

Philippines

Eliseo Rio, an official within the country's Department of Information and Communications Technology (DICT), says that domestic operator Philippine Telegraph and Telephone Corp (PT&T) should first pay off all its outstanding debts before considering vying to secure the third telecoms operator slot as the local partner of China Telecom. In a phone interview with The Manila Times, Rio reportedly said: 'They should pay off their debts first … How could they become a player if they have debts?' in response to widespread press speculation mentioning PT&T as one of the possible partners of the state-run telco chosen by the Chinese government to invest in the country's telecommunications industry. Further, Rio went on to point out that China Telecom should choose a local partner with 'strong financial backing' to prevent a repeat of what happened to San Miguel Corp (SMC) in 2016, which was eventually forced to concede in its bid to establish a credible third operator, in the process selling off its telecommunication assets to the de facto duopoly PLDT Inc. and Globe after partnership talks between SMC and Australian telco giant Telstra collapsed. 'The partner of China Telecom should be a big consortium. If they form a consortium, there is a chance that they can compete,' he added, stressing that the government would lend its full support to help get a new entrant off the ground. (December 18, 2017) telegeography.com

According to an unconfirmed report from the office of the President of the Philippines, Rodrigo Duterte, China Telecom has been 'selected' to become the Philippines' third nationwide telecommunications operator. Officials in the Southeast Asian country reportedly announced the plan, as the government seeks to stir up competition to boost the Philippines' poor performance where it comes to fixed line broadband and mobile deployments. China Telecom is China's biggest fixed line network operator and third largest mobile services provider. Last month the president extended an offer to China to become the country's third telecoms operator in a bid to end the de facto duopoly of PLDT Inc. and Globe Telecom. A spokesman for the President's office was quoted at the time as saying that Duterte is determined to improve the domestic telecoms landscape, where data and voice services rank among Asia-Pacific's slowest and most intermittent, and where the president has had to warn PLDT and Globe to 'shape up' or face new competition. 'The Chinese government selected China Telecom to invest in the Philippines upon invitation by President Duterte during the bilateral meeting on 16 November,' said Eliseo Rio, secretary of the Department of Information and Communications Technology (DICT). Given that a Chinese investor would need to work in partnership with a local company, government is now looking at who will partner with the state-run China Telecom on a 60-40 basis, Rio added. In a social media post Monday, Rio is said to have confirmed that the DICT and National Telecommunications Commission (NTC) had already started preparing the rules for a

selection process, which he compared to a 'beauty contest'. It is understood the guidelines will form the outline for the award of prized frequencies to allow a newcomer to challenge the big two. 'We will make sure that it goes to an organization with the financial and technical clout to really be able to compete and not merely be gobbled up by the duopoly,' Rio said.
(December 11, 2017) telegeography.com

The Department of Information and Communication Technology (DICT) says it intends to hold a 'beauty contest' style auction for the rights to become the country's third telecoms operator to compete with de facto duopoly PLDT Inc. and Globe Telecom. Local news cites DICT secretary Eliseo Rio as saying that the agency will look to identify telecoms companies interested in becoming the third operator this year – with the selection process set to follow in 2018 – and has even hinted at the possibility of a fourth player entering the market. 'It might be too late to select a new player before the end of this year, what could be done is to just identify them, and have the selection process by next year,' Rio told reporters, confirming that PLDT and Globe, and their various subsidiaries will be barred from participating. It is understood that the DICT is considering a 'grading system' to evaluate potential new entrants rather than a traditional auction, in which it will review bids based on 'track record, financial capability and technical know-how'. Rio also pointed out the government's concerns that it would be unfair to ask a third (or fourth) player to stump up all their frequency fees upfront given the historical evolution of the Philippine telecoms market. 'Knowing that the two big telcos never underwent any auction process on the frequencies they acquired, it would be disadvantageous to require a third telco to put up up-front money to get frequencies, which the two big telcos may be able to out-bid anyway. So, it would be a beauty contest as to [which] will be able to compete the best with the two giants, for the benefit of the consumers,' the DICT official said. According to the Malaya newspaper, Rio declined to elaborate on the exact frequencies that the government would look to offer, although it will likely include excess frequencies surrendered by PLDT and Globe after their joint acquisition of San Miguel Corp.'s telecommunication business. In total, some 85MHz of frequencies are available in the 700MHz, 800MHz, 1800MHz, 2300MHz, 2500MHz and 2600MHz bands – albeit the big two have much bigger allocations

(290MHz for PLDT, and 210MHz for Globe). Further, the DICT notes that there are still two 3G frequencies available for potential telecom players, although it estimates that a newcomer would need to invest PHP30 billion (USD596 million) in the first two years to deploy a network, and would need to build at least 2,000 to 3,000 base transceiver stations (BTS) nationwide to compete with PLDT's over 12,000 BTS and Globe's over 7,000. Telecom companies Philippine Telegraph & Telephone Corp (PT&T), NOW Telecom and Converge ICT Solution have indicated interest to be the third telecom player, although the regulator the National Telecommunication Commission (NTC) has urged broadband operators to apply for a cellular mobile telephone system (CMTS) license if they are genuinely interested in entering the mobile market. Back in 2000 there were ten licensed CMTS operators in the Philippines but after a raft of consolidations, today the market is down to two, PLDT's Smart unit and Globe. (November 28, 2017) telegeography.com

President Rodrigo Duterte of the Philippines has extended an offer to China to become the country's third telecoms operator in a bid to end the de facto duopoly of PLDT Inc. and Globe Telecom. A spokesman for the president's office is quoted as saying that Duterte is determined to improve the domestic telecoms landscape, where data and voice services rank among Asia-Pacific's slowest and most intermittent, and where the president has had to warn PLDT and Globe to 'shape up' or face new competition. President Duterte made the offer last week to visiting Chinese Premier Li Keqiang, which Reuters notes is 'the latest sign of his pursuit of closer political and economic ties' with China, after years of territorial disputes and mistrust. In a media briefing, presidential spokesman Harry Roque set out the government's plan to improve telecoms access: 'The good news is consumers can look forward now to better telecommunications, not just in terms of cellular technology but also in terms of internet speed, as well as access.' Whilst no specific Chinese company is in the frame to enter the market, Roque bullishly stated 'the announcement is that telecoms duopoly is about to end'. In 2007 ZTE Corp of China was awarded a USD330 million contract by the Philippines government to set up a broadband network linking state agencies, but the deal was subsequently annulled over allegations of corruption.
(November 20, 2017) reuters.com

Poland

The Polish Senate has passed a law allowing the country's cellcos to test new wireless technologies without incurring frequency utilization fees. Telecoms watchdog the Office of Electronic Communications (Urzad Komunikacji Elektronicznej, UKE) says the move is designed to provide incentives to promote

development in sectors such as future 5G mobile services. The Act also provides for the possibility of obtaining permission to use radio equipment for research, testing and experimentation, as well as non-technological purposes such as refarming.
(November 20, 2017) telegeography.com

Russia

The State Commission for Radio Frequencies (SCRF) is planning to hold an auction for LTE-suitable frequencies in the 450MHz band in five federal subjects of Russia – Ingushetia, Chukotka, Nenets, Yakutia and Chechnya – on December 28. In three of the divisions – Ingushetia, Chukotka and Nenets – 450MHz spectrum has never been issued, while two operators active in Yakutia and Chechnya showed no interest in the frequencies. The 450MHz band – previously used for analogue NMT services – is a non-standard range for LTE technology. In the 2000s, most of the NMT operators were merged into SkyLink, a subsidiary of Rostelecom, which used the spectrum for 3G CDMA services. SkyLink tested LTE-450 technology in late-2013, though in August 2014 all mobile (2G/3G/4G) spectrum licences allocated to Rostelecom (including SkyLink's) were transferred to the newly restructured Tele2 Russia, which launched LTE-450 in Tver in May 2013, with another five regions – Moscow (metropolitan), Moscow region, St. Petersburg, Leningrad and Novgorod – following in June. (December 20, 2017) cnews.ru

Slovakia

The Office for the Regulation of Electronic Communications and Postal Services (Regulacny Urad, RU) says it has begun preparing the ground for the future development of 5G mobile services. The watchdog is urging the country's wireless operators to utilize spectrum refarming to organize their frequency holdings into contiguous blocks to improve the efficiency of services, adding that it expects to resolve the situation in 2018. The RU recently awarded spectrum in the 3.7GHz band to a number of firms including Amtel, Slovanet, Towercom, DSI Data, O2 Slovakia and HMZ Radiokomunikacie. The regulator says that Slovakia is the only EU country to have fully allocated the 3.5GHz and 3.7GHz spectrum bands which could be used for future 5G networks. The RU is also looking at the 26GHz band for broadband wireless access. Separately, the RU has opened a consultation into the use of spectrum in the 450MHz band which has been vacated by Slovak Telekom. Earlier this year the telco said it had opted not to utilize its concession offering 2×4.42MHz in the 450MHz range, and the regulator is now proposing a new tender for a larger 2×5MHz duplex block. (December 20, 2017) telegeography.com

South Africa

The Independent Communications Authority of South Africa (ICASA) has confirmed that wireless operator Cell C 'followed the correct process in the notification of its recapitalization transaction and that it had complied with all applicable regulations', according to a Cell C press release. Company CEO Jose Dos Santos said: 'A recapitalized Cell C is good for the industry, the economy, and the consumer at large. The successful conclusion of this transaction has ensured a sustainable future for the company and its employees. We now have a solid foundation to really drive competition in an industry that has been marred by a duopoly at the expense of the consumer.' Cell C concluded its recapitalization – which increased the ownership of South African shareholders from 25% to 86% – in August 2017, with South Africa's airtime provider Blue Label now holding 45% of Cell C, while 3C Telecommunications – itself owned by Oger Telecom 45.6%, the Employee Believe Trust 29.4%, and broad-based black empowerment (BBBE) grouping CellSAf 25% – is in charge of 30%, Net1 (15%) and Cell C management and staff (10%). In September 2017 ICASA launched an investigation into the process, after revealing that its preliminary view was that 'the Cell C recapitalization transaction – on the face of it – triggers the provisions of Section 13 of the Electronic Communications Act of 2015 and ought to have been filed as an application for change of control of the licensee.' (December 4, 2017) telegeography.com

Telecoms regulator the Independent Communications Authority of South Africa (ICASA) has amended its draft proposals on data bundle expiry periods, with the new document stating that all pre-paid bundles will have a minimum validity of three years. In August 2017 the regulator proposed that data bundles should come with tiered expiry periods – the larger the bundle, the longer validity it would have. Under the original proposal, data bundles with up to 50MB of allowance were to have ten days' validity; 50MB-500MB (30 days); 500MB-1GB (60 days); 1GB-5GB (180 days); 10GB-20GB (twelve months) and 20GB and more (24 months). All interested parties are now invited to submit their comments until January 3, 2018, with the final regulation scheduled to be approved by March 31, 2018. (Nov 20, 2017) telegeography.com

Spain

Ministry of Energy, Tourism and Digital Agenda (Ministerio de Energia, Turismo y Agenda Digital, MINETAD) has announced plans to 'promote the development and deployment of 5G technology' via the auction of spectrum in the 1452MHz-1492MHz ('1.5GHz') and 3600MHz-3800MHz ('3.6GHz') bands in early 2018. The auction process will form part of the government's 'Plan Nacional 5G', and is said to be 'fully compatible' with the EU's roadmap for the deployment of 5G networks. (December 4, 2017) telegeography.com

Spain has opened a consultation on the use of 700-MHz spectrum for 5G mobile services. The Ministry of Energy, Tourism and the Digital Agenda plans to release this second digital dividend, airwaves between 694 MHz and 790 MHz, by moving digital terrestrial TV services to the 470 MHz-694 MHz band. "The release of the 700 MHz band, known as the second digital dividend, is a European-wide process, which aims to ensure a coordinated approach to the use of this band in the European Union, which will be key to the provision of 5G services. And the extension of its coverage, in rural areas in particular, ensuring access and connectivity," the Ministry said in a statement. It will guarantee the availability of the 470 MHz-694 MHz band for DTT services until at least 2030, it said. The Ministry published its plans and will allow interested parties – including public bodies, telecoms operators, industry associations and end users – to comment until February 19. The comments it receives will help it to design the plan for allocating 700 MHz to mobile and set out a timetable for doing so. (November 29, 2017) totaltele.com

Tanzania

The government has reportedly claimed that Bharti Airtel's local unit belongs to state-owned Tanzania Telecommunications Company Limited (TTCL). President John Magufuli said to national broadcaster TBC: 'Airtel, according to the information we have, is an asset of Tanzania Telecommunications … A terrible game was played. I don't want to say more than that.' In June last year an amendment to the Electronic and Postal Communications Act of 2010 made it a legal requirement for the country's telecoms operators to float at least 25% of their shares on the Dar es Salaam Stock Exchange (DSE). Vodacom launched its initial public offering (IPO) in March this year, although it was only open to local investors. Airtel has yet to list Airtel Tanzania, in which the government has a 40% stake. (December 22, 2017) bloomberg.com

Ukraine

The telecoms regulator the National Commission for the State Regulation of Communications and Informatization (NCCIR, or locally abbreviated to NKRZI) has announced plans to launch a tender for LTE spectrum in the 1800MHz band. Applications for the spectrum in the 1710MHz-1785MHz/1805MHz-1880MHz band will be accepted from 26 December until 26 January, while the auction will be carried out on February 26, 2018. The winners are expected to be announced in March 2018.(December 22, 2017) telegeography.com

The regulator National Council has published a list of the most viewed TV channels via OTT and IPTV in the country. In its survey, which looked at 100% of the households connected to the OTT and IPTV services offered by Volia and Triolan, the country's two leading cable operators, it found that this October the most viewed channels overall were 1+1, Ukraina and ICTV. Looking at specific genres, STB, Novij, 2+2, K1 and TET were the most popular entertainment and PlusPlus, Pixel TV, Cartoon Network, Nickelodeon and Volia Cine+ Kids HD the most popular kids channels. Meanwhile, Mega, Discovery Channel, National Geographic, Nat Geo Wild and Viasat History were the top documentary channels and 112, NewsOne, Espresso, Channel 24 and Direct the leading news and information channels. Among movie channels, the most watched were Fox, TV1000 Action, Enter-Film, TV1000 East and TV1000 Comedy, while M1, Music Box UA and EUMusic topped the music chart. In the sports genre, Futbol1, Fubol2 and Eurosport 1 were the most watched.(November 27, 2017) broadbandtvnews.com

United Kingdom

The British government is set to outline plans to deliver super-fast broadband services to 1.1 million customers, as industry regulator OFCOM warns that Britain's rural communities are being left behind. Ministers will unveil plans this week to deliver adequate broadband services to remote and rural properties by 2022. At present, 1.1 million homes and businesses in the UK are unable to access adequate broadband services, according to a new report issued by industry regulator, OFCOM. Ofcom's Connected Nations 2017 report states that 1.1 million premises were unable to obtain download speeds of 10Mb/s or upload speeds of 1Mb/s. The figure has fallen from 1.6 million people in 2016. "Broadband coverage is improving, but our findings show there's still urgent work required before people and businesses get the services they need, said Steve Unger, chief technology officer at Ofcom. The report highlights customers in rural areas as being particularly short changed when it comes to broadband speeds. The report states that 17% of businesses in rural areas cannot access broadband speeds that are sufficient to meet their business needs, compared to just 2% in metropolitan areas. "Everyone should have good access to the internet, wherever they live and work. So we are supporting plans for universal broadband, and promoting investment in full-fiber technology that can provide ultrafast, reliable connections." A number of industry analysts called for more to be done to boost connectivity for businesses in the UK's rural communities. In addition to highlighting deficiencies in fixed line services, the report also drew attention to the availability of 4G mobile connections across the country. "'Total' geographic 4G coverage, where a signal is available from all four mobile operators, is available across just 43% of the UK. For calls and

text messaging, 30% of the UK's geography does not receive a signal from all four operators – down from 37% last year," read a statement from Ofcom.
(December 17, 2017) totaltele.com

Telecoms regulator OFCOM has told BT to speed up investment in the UK's broadband infrastructure, or risk being left behind by its competition. Ofcom's Chief Executive Sharon White used a speech, delivered at the offices of Virgin Media, to single out Britain's incumbent telecoms provider for reproach. "BT has the financial and technical wherewithal to transform its digital infrastructure for the modern era. The question for BT is: does it lead the transformation today as the self-proclaimed national champion, or does it follow, playing catch-up on its nimbler rivals?" she said. White highlighted the fact that just 3% of BT customers are connected to a full fiber line and argued that this puts Britain's businesses at a distinct disadvantage compared to its European neighbors. In Spain, for example, 60% of homes and businesses have access to full fiber, gigabit capable networks. White delivered a stark warning for BT, telling the former monopoly provider that it would need to reassess its priorities going forward, focusing on what she referred to as "the national priority". "Competition for fiber is growing, as will consumer demand for it. As the owner of Openreach it should act in the interest of all of its customers who rely on it, as well as its shareholders." The UK government has set its own target of delivering fiber to the home (FTTH) broadband services to 10 million homes and businesses by 2023. BT will be expected to play a key role in delivering this pledge. Open Reach has committed to connecting 2 million premises to its FTTH networks by 2020 but is under pressure to increase this number. Last month, Vodafone and City Fiber signed a £500 million deal to bring FTTH services to 5 million homes in the UK, effectively fulfilling 50% of the government's pledge. The UK government has this month created a £190 million fiber broadband fund to encourage the roll out of FTTH services across the country.
(December 4, 2017) totaltele.com

An appeal by British mobile network operators (MNOs) over local telecom regulator Ofcom's decision to sharply increase annual license fees in September 2015 has been upheld by the Court of Appeal (CA). In October 2013 Ofcom set out a revised fee schedule under which the total payable by the UK's MNOs for their 900MHz spectrum allocations would rise to GBP138.5 million (USD184 million), while for the combined 1800MHz holdings it would increase to GBP170.4 million. Despite a less than favorable reaction from the nation's cellcos, a final ruling on the matter was issued by the watchdog in September 2015, confirming the significantly higher fees. As per this decision, the quartet would be required to pay a combined annual total of GBP80.3 million for the 900MHz band, and GBP119.3 million for the 1800MHz band; the total – GBP199.6 million – represented a marked increase from the GBP64.4 million the operators were paying prior to the ruling. The new fees came into effect in two phases; one half of the fee increase became due from October 31, 2015, with the full fees payable annually from October 31, 2016. Now, however, the Treasury may have to issue a refund, after the CA upheld a challenge by the MNOs in which they claimed that the government was not technically allowed to order Ofcom to force annual license fees higher. According to the Financial Times, the matter was challenged on the basis of EC laws regarding infrastructure investment, and with it possible that the government will now have to return the increase in fees paid over the last two years, it has been estimated that this this figure would be between GBP200 million and GBP300 million. While Ofcom will now have to consult further on plans for annual license fees, it is understood that the CA ruling could itself yet be appealed in the Supreme Court. In response to the ruling, an EE spokesman was cited as saying: 'This case raised an important point of law concerning the Government's spectrum direction to Ofcom. We are considering the judgment carefully … We're happy with the outcome as we've always supported the view that the trebling of spectrum fees was excessive and would harm network investment.'
(November 24, 2017) telegeography.com

United States

The Federal Communications Commission voted to allocate an additional 1.7 GHz of radio spectrum for 5G development shortly before Thanksgiving. The decision comes a month after the FCC changed its rules to encourage 5G investment in the 3.5 GHz spectrum. In anticipation of its rollout in the coming years, the FCC has made attempts to ensure the United States is at the forefront of 5G innovation. The FCC's decision provides 700 MHz in the 24 GHz band and 1 GHz in the 47 GHz band. The agency in October also proposed lengthening license terms in the 3.5 GHz band from three years to ten years and consolidating license area sizes to partial economic areas or counties. The latter would reduce license areas from more than 74,000 to between 416 to 3,144 areas. It is hoped that these changes would encourage large wireless providers to invest in 5G development. Prior to the October proposal, AT&T requested an extension to its license to conduct 5G testing using the 3550-3600 MHz spectrum in Georgia. "The Commission deserves credit for recognizing the need for spectrum as the foundation for 5G, helping the United States maintain its global leadership in the development of next generation wireless services," said AT&T in anticipation of the FCC's November vote. "The FCC will play a critical role in these activities as well, and we value their participation," concluded the carrier. AT&T is hoping the FCC will auction the newly allocated spectrums by the end of the year, with the goal of commercial 5G deployment by 2019.
(December 7, 2017) petrilla.com

Vietnam

The Ministry of Information and Communications (MIC) has awarded a license to provide 4G LTE services to Vietnamobile, reports SGGP Online. The company has become the fifth wireless network operator in the country to be licensed for 4G services, after Viettel, MobiFone, VNPT-Vinaphone and GTel Mobile. Vietnamobile's new permit is valid until 15 September 2024. Vietnamobile is a joint stock company (JSC) between Hanoi Telecom Company (HTC) and Hutchison Asia Telecom (HAT), a wholly owned unit of multinational conglomerate CK Hutchison. In September 2017 the cellco announced that its 3G network coverage had reached all 63 cities and provinces of the country, covering 90% of the population.

(December 12, 2017) telegeography.com

Zambia

No fewer than three companies have stepped forward to bid for Zambia's fourth mobile network operator (MNO) license. While the report does not name the companies involved in the tender process – which is now expected to close next month – it does claim one is British and the other two are African, citing Zambian Communications Minister Brian Mushimba. The tender was supposed to close last week, but the deadline has been extended to December 18, as some of the bidders reportedly requesting needing more time. 'Some of the interested parties came on board very late and for them to give a comprehensive report, they need to get on the ground and travel across the country,' Mushimba was cited as saying. With regards to an outcome, the communications minister has indicated that the government expects to have a selected a winning bid by June 2018.

(November 30, 2017) telegeography.com