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SAMENA TRENDS

EXCLUSIVELY FOR SAMENA TELECOMMUNICATIONS COUNCIL'S MEMBERS

BUILDING DIGITAL ECONOMIES



Tech Mahindra:
Network of the Future

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Interview

Eng. Atef Helmy
Senior Advisor to Board
Orange, MEA



THIS MONTH

**SMART ENVIRONMENT & SUSTAINABLE
INVESTMENTS**

2018 Middle East 5G White Paper

Unlocking Digital Opportunities with 5G: A GCC Outlook

5G could generate approximately USD270 billion for the GCC ICT Industry by 2030. The GCC has made a good start and needs to accelerate the ecosystem development.



Learn more from the White Paper:



SAMENA TRENDS

Editor-in-Chief
Bocar A. BA

Contributing Editors
Izhar Ahmad
Javaid Akhtar Malik

Contributions
A.T. Kearney
Dimension14
SAMENA Council
Tech Mahindra

Publisher
SAMENA Telecommunications
Council

Subscriptions
subscriptions@samenacouncil.org

Advertising
ads@samenacouncil.org

SAMENA TRENDS
trends@samenacouncil.org
Tel: +971.4.364.2700



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Smart Environment & Sustainable Investments

We are already experiencing a smart environment, sometimes which overwhelms us with ubiquitous computing, displays, sensors, and awe-inspiring innovative use of technologies, which are emerging by the day. The notion of smart environment really is the beginning of the manifestation of smart cities - and we have reasons to believe that the century we are now in, is the century of cities. Cities built so far have come into existence after the implementation of invasion human-centric infrastructures and accommodations. Resultantly, environments throughout the world have been transformed, some to the point of not return. A rough assessment shows that cities all around the world are consumers of more than three-fourths of the world's energy and generate an environmental impact, especially from green-house gas contributions, of similar proportions.

Smart cities are built on the principle of sustainability in urbanization, economic development, and reduced impact on the environment. But one of the fundamental areas where we are still lacking is standardized consistent indicators, databases and methodologies for assessing, financing, and implementing smart-environment and, smart-city initiatives. In this regard, ideas, investment, and stakeholder collaboration needs to first go into addressing the standardization of mobility and environmental aspects of building a smart environment. Mobility is important as it directly impacts sustainability, economy, and citizen lifestyles, and operations of city governments. Ultimately, the goal is to achieve public accessibility - whether to information or resources, service quality, efficiency, savings, and reducing carbon footprint.

In a smart-city environment, the above ground-realities have to be understood and mitigated.

This can be done with innovations that prevent over-consumption of energy resources; help renew and run on renewable energy; control pollution; make urban management efficient and green; help manage urban waste, urban lighting, water drainage, and contamination; and help improve the overall experience of a digitally connected and technology-savvy citizen.

In the soon-to-be-realized smart environments, billions of objects or "things", which will raise new challenges, will be connected to address, ensure, or mitigate the requirements and challenges in a thriving smart environment. This is cause for more research, harmonization efforts, and investment - with the latter being done in any of the tested public-private-partnership modes. Any smart environment context is now linked with visions for 5G, to accelerate which harmonization and standardization efforts are underway. Building the smart environment ecosystem requires attention to national and regional priorities, ground realities, technologies, protocols, service applications, and, most importantly, assurance of sustainability of investments.

Implementation of smart environment, by now, has now become a recognized, sizeable market opportunity and thus no longer remains a series of technology projects. Intelligent transportation, data-driven public safety through visual intelligence, for example, and resilient energy and public infrastructure, all are transpiring before our years. As this implementation accelerates, our aim should be to ensure that we pay special attention to enabling each stakeholder for meeting individual and collective success, and ensure policy and regulatory measures sufficiently make ways for sustainable returns on sustainable investments. 🌱



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

Q. How do you see growth trends within the MENA industry?

A. Regarding growth trend in MENA region, there is no "one growth trend", it depends very much on countries.

Voice and data usage is having a steady growth, thanks to abundance offers and new technologies (4g), supporting and ARPU growth. One can notice that usage patterns in MENA region is now very close to European ones, with high 4G penetration, high data consumption, and even an increasing share of postpaid customers thanks to hybrid offers.

At Orange we clearly answer on developing video platform, vertical sector specializations, network virtualization, data centres and new B2B services from cloud to cyber security, IoT to managed services for corporates, large EGovernment projects down to packages services to SMEs and SOHOs.

Q. How should operators laser-focus on driving value from digital for both themselves and for their customers?

A. Challenged by new technologies, new competitors from different spheres, new vertical sectors and emerging markets, telecommunications operators must find new roles and business objectives in the increasingly fragmented landscape of the digital economy.

For historical telcos such as Orange present in the Region for decades, 3 main questions are raised:

1. How can the traditional telco assets of customer relationships and data, spectrum and network infrastructure be exploited in the emerging smart economy?

Answer in continuous investment in the networks, new investments in new and additional digital services such as Entertainment, mobile financial services, Energy and everything core to our customers leveraging new ICT and digital possibilities



Eng. Atef Helmy
Senior Advisor to Board
Orange, MEA



2. Where should the focus for future investment be ?

At Orange we clearly answer on developing video platform, vertical sector specializations, network virtualization, data centres and new B2B services from cloud to cyber security, IoT to managed services for corporates, large EGovernment projects down to packages services to SMEs and SOHOs.

3. What is the best way to overturn entrenched mindsets, attract new talent and drive innovation?

To these 3 points let me also add - based on my personal background - a fourth key question: How can telcos ensure a fair, competitive regulatory environment in areas such as taxation, licencing, data flow and privacy, crucially needed to enable the precedent investments mentioned into networks and services

We absolutely need to define the basis of a continuous win-win long term cooperation with States and regulators on a stable régulation but also with international institutions on new ICT developments, Smart cities programmes and global access to education, digital and financial inclusion in the Region.

Q. You have called on international cooperation on some of the most prevailing and tough challenges. Please shed some light on this in view of your leadership in SAMENA Council.

A. We absolutely need to define the basis of a continuous win-win long term cooperation with States and regulators on a stable régulation but also with international institutions on new ICT developments, Smart cities programmes and global access to education, digital and financial inclusion in the Region.

We also probably need to be collectively even more cooperative and proactive in common initiatives among operators when possible to accelerate ICT programs and developments in the Region.

This mean more cooperations between telcos in fostering new digital services and local start up développements (for instance roll out best ideas and pilot projects when it makes sense in cooperation with national state programs and incubators), accelerate networks sharing when possible on the cost side, and build strong cooperations with the regional states and players on the new big challenges of the industry : leverage the arrival of the 5G to foster new services, invest in IOT, meet together the challenges and promises of Big Data to name a few.

Q. What impediments do Operators and Regulators continue to face in their coordination among themselves on leading industry issues?

A. The ITU finds that fewer than 15% of households in Least Developed Countries have access to Internet at home. Policymakers all over the world are now recognizing these challenges and working to implement reforms that will protect competition and consumers without impeding social and economic progress

Digital inclusion of the populations should be the prime concern. This means developing public policies, in conjunction with operators and other stakeholders to demonstrate and highlight the benefits of Broadband and High Speed Broadband to consumers, businesses and government

Obviously, Designing & implementing a regulatory policy incentivizing Investment is another key : we need to strike a fair balance between stimulating investment and encouraging competition è need for a stable and investment friendly public policy and the work is in progress.

Other key battles still need to be led on : License granting / license renewals & acquisition and renewal of spectrum:renewing existing licenses, getting new licenses, getting frequencies for 3G and 4G need to be done under

sound economic and financial conditions.; Alleviating the taxation of our industry to stimulate investment and Improving significantly national / regional / international connectivity(bandwidth with fiber networks) by eliminating national monopoly barriers and implementing PPPs. There is a clear Need for creating sound regulatory/economic/financial conditions fiber network developments within and between countries and ensuring that these are performed within an open commercial framework

We also probably need to be collectively even more cooperative and proactive in common initiatives among operators when possible to accelerate ICT programs and developments in the Region.

Q. In your vision, how will the industry look like in 2020?

A. As mentioned, in my view, for telecoms, key objective is to continue to be the main digital interface for customers to access a whole range of offerings AND remain the main network provider, as there is still much value in this role.

It means become a true "digital distributor" of third parties' digital services and accomplish our own digital/ multi-channel transformation, meaning making smart use of digital technologies for instance to foster a wholesale digital transformation.

Digitization in this regard is not just only a threat; it also offers telecom companies a world of opportunities to rebuild our market positions, reimagine their business systems, and create innovative offerings for customers and Pursue adjacencies such as financial services, IT services, media, or utilities through partnerships to become a successful multiservice provider

On the B2B side, the big changes will turn around networks upgrades and its virtualization and strong development

of B2B digital services such as Cloud, data centres, security, IoT, and manages services

Q. In your opinion, are Operators making progress (and are using private-sector representative platforms available to them) in presenting their requirements in a unified manner?

A. Absolutely. The so-called platformization of new services to the Region is about to become a game changer and we are actively working on it.

To name a few Successful projects and case studies:

- Dubai Silicon Park/DSO: Silicon Park is the first smart city project at Dubai Silicon Oasis.
- **Saudi Arabia:**
- YANBU INDUSTRIAL CITY: is the perfect example of a smart city transformation. The city is transformed by a new communications infrastructure that will bring big advantages in the economic marketplace and to position Yanbu as

the model for Smart Cities.

- King AbdelAziz Road: King Abdul Aziz Road will support 30 million pilgrims in Makkah by 2030. Pilgrims will flow from the train station, over the boulevard towards the holy site. This journey touches multiple services, access control, way finding, crowd control, security and so on. . This is a perfect example of a citizen journey that responds to the Smart City requirement.
- Jeddah Tower – is a Vertical Innovative Smart city that will make extensive use of digital technologies for smarter living and working environment.
- E Government: smart cities projects in Mazagan (Marocco) and Damniano (Senegal) and tomorrow around Egypt's new capital city
- Rural electrification: first moves of African countries to offer a stable and tax friendly regime to initiatives in rural electrification
- E Identity: programs from the World Bank; interest of the Mobile Industry to support Mobile connect for governmental usages + Strong PPP

prospects ahead in E Education, Health and mAgri solutions based on new ICT and mobile- based solutions

For telecoms, key objective is to continue to be the main digital interface for customers to access a whole range of offerings AND remain the main network provider, as there is still much value in this role.

SAMENA Region is today well positioned to become a leading and role-model region in Public-private initiatives fostering inclusive development, stimulating public and private infrastructure and providing affordable universal access to devices and services, among with massive skills development programme to underpin the growth of ICTs throughout society. 🌱



SAMENA COUNCIL ACTIVITY

SAMENA Council Witnesses ITU Member States Re-elect ITU Secretary-General, Deputy Secretary-General, Director TSB; Elect new Director BDT; and Successfully Conclude ITU's Radio Regulations Board and Council Election Process

The election took place in Dubai, United Arab Emirates, during the Plenary session of the PP-18 conference



Mr. Houlin Zhao

Member States of the International Telecommunication Union (ITU) have re-elected Mr. Houlin Zhao of China as ITU Secretary-General during the Union's 20th Plenipotentiary Conference (PP-18) in Dubai, United Arab Emirates. Zhao won the position with 176 votes, from 178 ballot papers deposited. He contested the position unopposed.



Mr. Malcolm Johnson

Mr. Malcolm Johnson of the United Kingdom was re-elected Deputy Secretary-General of ITU with 113 votes. 178 Member States were present and voting and the required majority was 90.



Dr. Chaesub Lee

Dr. Chaesub Lee of the Republic of Korea was re-elected Director of the Telecommunication Standardization Bureau of ITU with 174 votes. 179 Member States were present and voting and the required majority was 88.



Ms. Doreen Bogdan-Martin

Ms. Doreen Bogdan-Martin of the United States was elected Director of the Telecommunication Development Bureau of ITU with 95 votes. This makes Ms. Bogdan-Martin the first elected female Director BDT in the history of the ITU. 179 Member States were present and voting and the required majority was 89. Cosmas Zavazava of Zimbabwe received 66 votes. William Ijeh of Nigeria received 16 votes.

Member States of the International Telecommunication Union (ITU) have elected a new Radio Regulations Board, while the ITU Council's 48 seats have also been occupied by both re-elected and various newly elected Member States from Regions A, B, C, D, and E. The elections took place in Dubai, United Arab Emirates, during Plenary session of the PP-18 conference on November 5, 2018.

New Radio Regulations Board (RRB)

Region A
The Americas
(2 seats)



Region B
Western Europe
(2 seats)



Region C
Eastern Europe and Northern
Asia (2 seats)



Region D
Africa (3 seats)



Region E
Asia and Australasia (3 seats)



New Radio Regulations Board (RRB)

Region A
The Americas
(9 seats)

Brazil
Mexico
Argentina
Cuba
Paraguay
El Salvador
Bahamas
United States
Canada

Region B
Western Europe
(8 seats)

Spain
Italy
Switzerland
Germany
France
Turkey
Hungary
Greece

Region C
Eastern Europe
Northern Asia (5 seats)

Romania
Russian Federation
Poland
Azerbaijan
Czech Republic

Region D
Africa
(13 seats)

Kenya
Algeria
Morocco
Rwanda
Egypt
South Africa
Ghana
Cote d'Ivoire
Senegal
Uganda
Nigeria
Tunisia
Burkina Faso

Region E
Asia & Austral-
asia (13 seats)

China
Japan
India
Thailand
United Arab Emirates
Indonesia
Philippines
Kuwait
Korea (Republic of)
Australia
Pakistan
Saudi Arabia
Iran

MEMBERS NEWS



Saudi Telecom Company (STC) Elected to the GSMA Board, the World's Largest Mobile Organization

GSMA, the world's largest mobile operator's organization has announced the election of Saudi Telecom Company (STC) as a member of GSMA's Board after the company won the board's election to join the top 25 mobile operators in the world. With more than 1,100 members from global mobile ecosystem, the number of customers benefiting from the organization's policies and guidelines is more than 7.5 billion. The GSMA organizes the most important mobile events in the world, such as the Mobile World Congress in Barcelona, the Mobile World Congress in Shanghai, the Mobile World Congress in the America and the Mobile 360 Series conferences. TC Group CEO, Nasser Al-Nasser, described the success in this election to join the GSMA board as an important achievement for the company, as it reflects the great potential and value of STC locally, regionally and globally. It also reflects the advanced position reached by the Kingdom's telecommunications sector with the support of the Ministry of Communications and Technology Information and Communications and Information Technology Commission to achieve the targets of the national transformation plan 2020, and the kingdoms vision 2030. Al Nasser said that GSMA has an important role to play on the global dimensions, and that STC's victory in this elections strengthen its position as an active member of the global mobiles industry and contributes to enhancing the Kingdom's contribution to the global



policies, as well as supporting opportunities to build alliances and partnerships with big international players .

10 Billion To Be Invested in Smart Cities in the Next Four Years: Tarig Enaya

Dr. Tarig Enaya, Senior Vice President of the STC Enterprise Business Unit, revealed that smart cities-associated technology investments that will take place in the next four years worldwide will reach USD 158 billion by 2022 in accordance with the IDC Report. The figure is expected to reach USD 2.7 billion (SAR 10.125 billion) in the Middle East and Africa. As part of his participation in the Future Investment Initiative conference, Enaya cited some examples of smart cities' applications in the emergency, transportation, tourism and security services fields, while pointing out that with the advent of modern, digital technologies, emergency services can, thus, be managed digitally. In this respect,

early warning systems - using these techniques - now allow city managers and emergency department employees to detect and respond to emergencies and disasters quickly and effectively. Whereas in the security field, this technology will facilitate the application of applicable laws, rules and regulations. In this respect, the continuous use of sensors and cameras in public areas would make the police more dependent on effective, digital data. Emphasis will, therefore, be placed on the collection of digital assets to improve the law enforcement process, complete investigation procedures, and manage criminal evidence. According to Enaya, the tourism sector has become

more intelligent, by providing real-time, interactive experiences to visitors. In this respect, Enaya referred to Mecca as an example of one of the most visited destinations in the world. Pilgrims are, therefore, guided through the "Manasikana" application in every step of the way, by using a number of different innovative technologies, all put together to that end. While in the transportation field, the various components of the intelligent transport, advanced public transport, intelligent traffic management, intelligent parking and independent vehicles systems would, therefore, ease traffic congestion.

Saudi Telecom Company to Redesign Company Network in Collaboration with Cisco

Saudi Telecom Company (STC) and Cisco have announced plans to collaborate on STC's network architecture transformation. STC is embarking on a mass-scale networking and automation project to support new capabilities and future innovations including the evolution of enterprise services, enhanced broadband and IoT, as well as the demands of multi-cloud environments. The new architecture buildout is based on Cisco's flagship service provider routing platforms and automation software. Cisco will provide a highly efficient abstraction layer between network services and the underlying infrastructure components in STC's complex, heterogeneous environment. This will help enable STC reduce service activation time, improve capital and operational efficiency and deploy new revenue-generating services at a speed only automation can enable. "We are evolving our infrastructure and building a path to self-healing autonomous networking that can transform business outcomes and dramatically improve existing operating models," said Haithem Mohammed Alfaraj, senior vice president of technology and operations, STC. "Working closely with a world leader like Cisco will help ensure our network is the first in the region to benefit from the latest innovations in networking hardware and software development." "Cisco has a long history and a strategic commitment to STC and the prosperity



of Saudi Arabia. This is exemplified by our multi-faceted Country Digitization Acceleration program that supports the development of the national digital infrastructure and a sustainable innovation ecosystem," said Ali Amer, managing director, global service provider sales, Cisco Middle East and Africa.

Saudi Telecom Company (STC) Announces the Company's Preliminary Financial Results for the Period Ending at 30 September 2018

Saudi Telecom Company (STC) announced the company's preliminary financial results for the period ending at 30 September 2018: In accordance with the approved dividend policy for three years starting from the 4th quarter 2015 which was announced on 11 November 2015, and have been ratified during the General Assembly Meeting on April 4th 2016, STC will distribute a total of SR 2,000 million in cash dividend for Q3 2018, representing SR 1 per share. The eligibility of dividends shall be for the shareholders at the close of trading on Monday 29/10/2018 and as per the registered shareholders in the register of The Securities Depository Center Company at the end of the 2nd trading day following the eligibility date. Dividend distribution date will be on 20/11/2018. The number of shares outstanding for Dividend 2,000 million shares. Commenting on the financial results, Eng. Nasser S. Alnasser, CEO of Saudi Telecom Company, stated that the net profit growth in the 9 months

period of 2018 compared to the same period last year by 2.9%, the net profit growth in Q3 2018 compared to the same period last year and 2nd quarter 2018 by 2.9% and 8.1% (respectively), was a result of the Company's constant efforts to provide best in class information technology services and the growth witnessed in both Enterprise and Wholesale Business Units. Eng. Al Nasser emphasized that STC will continue its strategy that aims to expand investment in different domains to diversify its source of income from both core and non-core business related activities. Further, the strategy is in line with the NTP 2020 and Visions 2030, which will enable the public and private sectors achieving their digitization plans. As a result, STC has announced the launch of STC Pay, an investment arm specialized in digital payments and the financial technology services (FINTECH) for individuals and institutes. Digital financial services are one of the new growth paths for STC,

especially at this time of rapid change in the telecommunications industry and the digital information revolution, said Eng. Nasser Al Nasser. Adding that STC Pay provides a quality value to the development of Digital Payments services in collaboration with major financial institutions and banks both locally and globally. Referring to the continuation of the company's achievements in serving pilgrims, Al-Nasser stated that the attention of the government leaders and other various sectors in the Kingdom for this year's Hajj was a significant milestone in achieving a new record for STC's network. The company recorded the highest peak hours in the history of the holy places, with a data transmission growth of 34% over the same period last year. In addition, the transfer of data through the 4G network has gone to the highest in history with more than 160% compared to the last year's record on the day of Arafat.

STC Solutions, Cisco Meraki to Drive Digital Transformation

Cisco Meraki and STC Solutions signed a memorandum of understanding (MoU) to drive wireless technology adoption and fuel economic growth in line with Saudi Vision 2030's digital transformation objectives. The MoU states the two companies plan to work together and develop innovative wireless managed services for the Saudi market, intended to make it easier and more economical for customers to start their digital journeys. Recognizing the need for sophisticated digital infrastructure, Saudi Arabia's Vision 2030 plan foresees increasing the availability and quality of digital connectivity. "STC and Cisco Meraki are dedicated to this mission, and will work together to help enable Saudi organizations to quickly deploy simplified wireless solutions with immediate business impacts," the companies said in a press release. Saudi organizations of all sizes and verticals are adopting Wi-Fi services for their existing and new

business locations. More than half of Saudi private enterprises have Wi-Fi in their head office, as well as in remote branches. There is also increasing investment in wireless solutions in tourism, hospitality, transportation and other sectors. Cisco Meraki, with its focus on simplicity and easy management through a centralized dashboard, will provide STC customers with unmatched visibility and control over their infrastructure. "STC constantly delivers the latest in managed services with an innovative approach to servicing our clients across all business sectors. We have a long-term relationship with our strategic partner Cisco, and we look forward to enhancing this partnership through adopting world-class solutions that will help our clients to accelerate their digital transformation journey. With the variety of networking and router management solutions that STC provides, the new managed services solution will

complement STC's current portfolio," said Hatem Al-Kadi, vice president of managed services at STC. "We are incredibly excited to work with STC to help drive digital transformation in the region. Cisco Meraki is a perfect match for STC and its customers, providing a secure, easy-to-use wireless experience. We look forward to working with STC to transform the digital footprint of Saudi businesses," said Salman Faqeeh, managing director – Saudi Arabia, Cisco. STC Solutions is part of Saudi Telecom Company's ongoing commitment to transform itself into a leading regional ICT player. STCS is accelerating STC's enterprise segment growth strategy through providing a wide range of ICT services beyond the traditional Telco offerings. Cisco is the worldwide technology leader that has been making the internet work since 1984.



Batelco Cloud Connect as the Ultimate Connectivity Solution to Support Business Cloud Initiatives

Batelco, the leading digital services provider in the Kingdom, has established connections with major global cloud and content delivery providers enabling enterprises and MNCs to have a one-stop-shop to reach their desired content. Batelco's Cloud Connect partnerships consist of immediate ties with cloud computing giants including Amazon Web Services, Microsoft, Google, Alibaba Cloud, and Oracle Cloud. With the growing demand for cloud computing services, Batelco's Cloud Connect Solutions further enables customers to achieve their business requirements and meet their digital objectives by means of bandwidth granularity, low latency and high available global reachability. Batelco's state-of-the-art owned and operated IP/MPLS network, with more than 26 PoPs geographically distributed across the globe and with a history of 100% availability over the last 12 years guaranteed through diverse cable systems, enables customers to connect through network-to-network interface

(NNI) arrangements with the fastest routes and lowest latency, promising significantly improved Cloud-based services and connectivity. Through these arrangements, Batelco provides customers with leveraged opportunities to derive greater business value by maximizing data. Batelco Cloud Connect Solutions are designed to enable enterprises and MNCs to rapidly scale their global digital business operations and to enable service providers to easily extend their reach to a wider global audience. With shifts in business models towards digitalization, Batelco Cloud Connect Solutions also allow customers to establish data connections in places that they are not present. In light of the importance of Batelco's Cloud Connect Solution, Batelco Chief Global Business Officer Adel Al-Daylami commented, "Batelco's Cloud Connect solution is ideal for businesses with growing bandwidth, dedicated network access and increased security demands, who are constantly seeking to provide customers with extensive



opportunities for vast improvement in data storage and computing. The solution provides customers a platform for cloud-based services and connectivity and also serves as a multipurpose interconnection exchange." "In line with the Kingdom's digitalization vision, Batelco's Cloud Connect Solutions have taken the provisioning of such services to a new level by allowing customers more resilient access to Cloud services and partner ecosystems, in order to ensure security-rich and accelerated data transfer," added Mr. Al-Daylami.

Batelco Group Announces 2018 Third Quarter Financial Results

Batelco, the regional telecommunications group with operations across 14 countries, announced its financial results for the third quarter of 2018, the three month period ended 30 September 2018 (Q3) and for the first nine months of 2018. In line with the promising figures announced for the first six months of the year reported in the H1 2018, the results for the third quarter show strong improvement compared to Q3 of 2017.

Financial Highlights

Q3 Net Profit attributable to equity holders of the company of BD17.3M, up 179% from BD6.2M in 2017 and Net Profit for the nine-month period attributable to equity holders of the company of BD46.0M, an increase of 83% over BD25.2M in 2017.

Q3 Operating Profit of BD20.0M, up by 78% from BD11.3M in 2017 and nine-month period Operating Profit of BD60.5M, an increase of 47% from BD41.2M in 2017.

Q3 EBITDA of BD36.3M, up by 33% from BD27.2M in 2017 and nine-month period EBITDA of BD109.2M, an increase of 20% from BD91.2M in 2017.

Q3 Revenues of BD101.5M, growth of 5% from BD96.5M in 2017 and Revenues for the nine-month period of BD301.5M, an increase of 9% from BD277.6M in 2017.

Q3 EPS of 10.4 fils compared to 3.7 fils in Q3 2017, an increase of 179% and EPS for the nine-month period of 27.7 fils compared to 15.2 fils in 2017, a 83% increase.

Group Financial Review

Batelco announced net profits attributable to equity holders of the company for the first nine months of 2018 of BD46.0M (US\$122.0M) up from BD25.2M (US\$66.8M) for the corresponding period in 2017, an increase of 83%. Similarly, net profit attributable to equity holders of the company for Q3 2018 was reported at

BD17.3M (US\$45.9M), a 179% increase from BD6.2M (US\$16.4M) for the corresponding period of 2017. Operating profit for the quarter is up by 78% to BD20.0M (US\$53.1M) from BD11.3M (US\$30.0M) in Q3 2017; while year-on-year operating profits increased by 47% from BD41.2M (US\$109.3M) in 2017 to BD60.5M (US\$160.5M). For the nine-month period, EBITDA increased 20% over the corresponding period of 2017 from BD91.2M (US\$241.9M) to BD109.2M (US\$289.7M) and EBITDA margin of 36%. EBITDA for the third quarter of 2018 stands at BD36.3M (US\$96.3M) compared to BD27.2M (US\$72.1M) in Q3 2017, representing an increase of 33%. In line with the first two quarters of 2018, revenues for the third quarter have increased by 5% over Q3 2017 from BD96.5M (US\$256.0M) to BD101.5M (US\$269.2M). Revenues for the first nine months of 2018 are BD301.5M (US\$799.7M) an increase of 9% when compared to BD277.6M (US\$736.3M) revenues for the first nine months of 2017. Revenues have been positively bolstered by continued strong performance at Batelco Bahrain, Umniah in Jordan and Dhiraagu the Group's operation in the Maldives. Revenues were mainly boosted by improvements in broadband and adjacent services, with growing broadband subscriber bases in all three locations. The Group's balance sheet continues to be strong with total assets of BD909.0M (US\$2,411.1M) as of 30 September 2018 compared to BD932.5M (US\$2,473.5M) as of 31 December 2017. Net assets as of 30 September 2018 stand at BD497.8M (US\$1,320.4M) compared to BD502.5M (US\$1,332.9M) as of 31 December 2017. The Group's cash and bank balances are a substantial BD151.2M (US\$401.1M).



This includes the impact of the interim dividend of 10 fils per share announced and paid during the quarter. Total Equity attributable to equity holders of the company is BD460.7M (US\$1,222.0M) compared to BD461.9M (US\$1,225.2M) as of 31 December 2017. Earnings per share (EPS) are 10.4 fils for the third quarter of 2018 compared to 3.7 fils in Q3 2017 resulting in EPS of 27.7 fils for the nine-month period compared to 15.2 fils for the corresponding period of 2017. Batelco Chairman, Shaikh Abdulla bin Khalifa Al Khalifa, announced the Third Quarter 2018 financial results following the meeting of the Board of Directors on November 1st at Batelco's Hamala Headquarters. "The Board of Directors is pleased with Batelco's performance for the first nine months of this year. The Group has witnessed a positive performance reflecting Batelco Group's overall strategic plans, and will continue to work at the same pace in all locations, in order to achieve the desired results for the full year.

Batelco Records Q3 Revenue Growth of 5%

Bahrain-based Batelco Group has published its third quarter 2018 financial results, recording revenue of BHD101.5 million (USD266.6 million), an increase of 5% from BHD96.5 million in the year-ago quarter. Batelco also reported strong growth in operating profit for the three months ended 30 September 2018, totaling

BHD20.0 million, up 78% from BHD11.3 million one year earlier. In terms of group EBITDA, Batelco saw year-on-year growth of 33% from BHD27.2 million to BHD36.3 million. Batelco Group CEO Ihab Hinnawi explained that the group's strong revenue and EBITDA growth was largely down to the successful implementation of its

transformational strategy and investment in fixed LTE, fiber-optic and digital solutions across all of its operations: 'We continue to reap the fruit of our efforts and have sustained the momentum established in the first half of this year, with strong performances in the third quarter, particularly at Batelco Bahrain, Umniah

in Jordan and Dhiraagu in the Maldives.' Hinnawi went on to say that in operational terms, the increased number of broadband customers contributed significantly to

growing revenues, with year-on-year growth of 9% in the total group-wide broadband subscriber base. The CEO noted that fixed broadband customers in

Bahrain were up 16% year-on-year in Q3 2018, while in Jordan and the Maldives, Batelco's fixed broadband users increased by 49% and 42% respectively.

Batelco Provides Digital and Cloud Based Solutions for the Health Sector

Batelco Bahrain has announced the launch of 'MyClinic' application, a digital cloud based solution that is ideal for medical staff working in hospitals and clinics across the Kingdom. The launch of MyClinic App is in line with the Kingdom's digital transformation efforts to develop advanced services for the business sector and all consumers. The application will help medical institutions by providing them with enhanced solutions such as: ability to use calendar to manage patients' appointments, patient management

system, availability of medical and lab history, radiology and prescription management, billing and accounting, in addition to a fully customizable dashboard including medical reports. The 'MyClinic' application will help healthcare providers enhance their interactions with patients, thereby improving their efficiency and effectiveness when providing medical assistance. It also serves to replace paper documents and file folders, making it more convenient. MyClinic is available through Batelco on easy and competitive installment

plans using Batelco's reliable Internet services. The solution is compatible with any browser on any handheld device and is available on both Android and iOS for smartphones and tablets. Technology is playing an increasingly important role in the healthcare sector and the launch of MyClinic will serve to greatly improve the communication channels within medical premises by establishing enhanced communication and reporting platforms.

Batelco and Huawei Sign Partnership Agreement



Based on the company's vision towards digital transformation and expansion in new growth areas, and as part of its of its strategy to provide smart digital solutions to the public and private sectors through a coherent and integrated system, that includes infrastructure for storing and managing data, Batelco signed a partnership agreement with Huawei, who will build an Uptime Institute Certified Tier III Data Centre for Batelco. The agreement, a significant development in the field of data management technology and

cloud computing, was signed by Batelco Bahrain CEO Mohamed Bubashait and An Jian, President of Carrier Business Group, Huawei Middle East Region, in the presence of members of the Executive Management from both companies on Wednesday 17th of October 2018 during GITEX 2018, held at the World Trade Centre, Dubai. With power capacity of 1.3 MegaWatt, the Tier III data center will offer customers the most reliable and scalable facility in the Kingdom and contribute significantly to the Kingdom's digital infrastructure.

Customers will also benefit from continuous support from the Company's 24-hour Network Operations Centre and business-continuity management facilities for both the public and private sectors, enabling customers to benefit from a high degree of quality, safety and reliability. Following the signing, Mr. Bubashait said, "Investment in IT infrastructure, especially data warehousing and processing, is a priority for the company as part of its strategy to deliver smart digital solutions including data storage and cloud computing solutions." "Batelco's plans to develop world class Data center 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," he added. An Jian, President of Carrier Business Group, Huawei Middle East Region said that Huawei is very pleased to join forces with its long-term partner Batelco to deliver the new Tier III Data Centre at the Company's Hamala Campus. "The Centre will be built to world class specifications to ensure the highest levels of availability, maintainability, resilience and seamless business continuity to support Batelco's growing operations," he noted.



Alfa and Nokia Deploy 4.5G Pro Technology for Ultra-Broadband on the Evolutionary Path to 5G

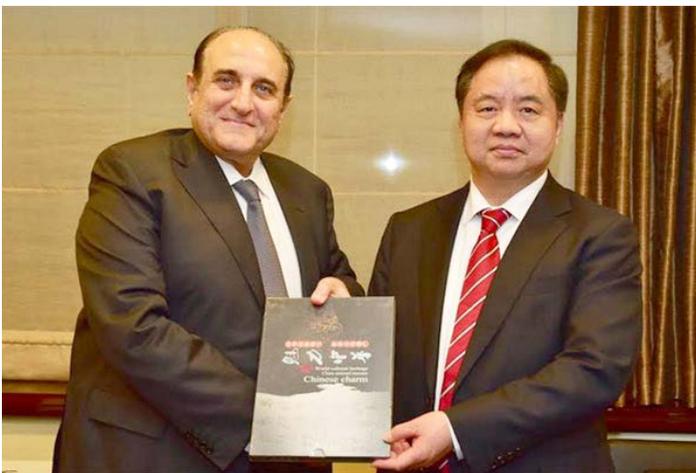
Nokia and Alfa, Lebanon's first mobile operator managed by Orascom TMT, will deploy 4.5G Pro technology using the Nokia AirScale 5G-ready radio platform following a recent successful test of the technology. With this, Alfa will be able to introduce Gigabit LTE speeds for its subscribers. The deployment follows the MOU signed in MWC 2018 and is an important step for Alfa to prepare its network to eventually offer innovative 5G services to its subscribers. This kind of higher-speed broadband will enable them to enjoy data-hungry applications and services such as Ultra High Definition video streaming, e-health and e-education, and can support millions of smart devices connected for Internet of Things (IoT) and smart cities. Alfa will use Nokia's 5G-ready, commercially available AirScale radio, three-carrier aggregation technique, 4x4 Multiple Input and Multiple Output (MIMO) and 256 QAM (Quadrature Amplitude Modulation) to achieve higher throughput, along with Category 16 (Cat 16) capable devices. Such capabilities are critical for operators facing relentless demand for data-driven services and preparing for the advent of 5G networks and services. Nokia has defined a clear path to 5G through 4.5G Pro and 4.9G. The company already announced 4.5G Pro and 4.9G in September 2016 to enable operators such as Alfa to meet the ever-increasing data demands of their subscribers. Marwan Hayek, Chairman and CEO of Alfa, said: "The road to 5G



was laid long ago in Lebanon with the launch of the country's first 4.5G network by Alfa. We continue this evolutionary path toward deploying the first 5G network in the country planned in 2019 through this 4.5G Pro deployment with our long-term partner Nokia. This deployment maintains our telecom leadership position and strengthens the foundation for eventual IoT services for smart cities in the country." Roger Ghorayeb, customer team head for growth in West MEA at Nokia, said: "We are delighted to continue supporting Alfa to quickly move toward 5G technologies and provide pioneering high-quality mobile broadband services. This deployment reiterates our commitment to modernize Alfa's network infrastructure with Nokia's latest technologies."



Du Signs Network Services Tie-Up with China's CCS



du, from UAE-based Emirates Integrated Telecommunication Company (EITC), has signed a network installation outsource for services (NIO) contract with China Communication Services International (CCS). The contract will enable CCS UAE to provide services for installation and maintenance works across

du's vast Access and Transport Network. Building upon the UAE's burgeoning relations with the Peoples Republic of China, Osman Sultan, CEO of EITC, recently welcomed Zhaoxiong Chen, Chinese Vice Minister of the Ministry of Industry and Information Technology, along with Xu Chu Guo, of China Communication Services International (CCS), to enhance business relations and to discuss business possibilities and different models specific to the telecommunications and IT industry. Osman Sultan said: "This contract signifies another bold step towards the unity and progress of our two countries and solidifies du's commitment to transform our core network so we can continue to be the backbone for solutions, services and experiences in line with the Smart City agenda. In signing this significant agreement, du will also boost development and prosperity of both the UAE and China through our aligned principles and Government-led strategic objectives." The scope of the contract between du and CCS includes telecommunication infrastructure, fiber network connectivity, FTTH, FTTX, GPON Migration, ICT Services for data centers, ISP and OSP Cabling. The implementation of this work will be carried out on both the copper and fiber networks.



Etisalat Seals Strategic Partnership Deal for Artificial Intelligence with NPCC

Etisalat announced its strategic partnership with National Petroleum Construction Company (NPCC), part of SENAAT Abu Dhabi, to implement Artificial Intelligence solutions for remote sensing, real time data, autonomous vehicles, and predictive analytics improving response time with all their consumers. NPCC, a leading international EPC contractor, provides engineering, procurement, construction,

installation and commissioning services to offshore and onshore oil and gas sectors. It is headquartered in Abu Dhabi with offices around the region. SENAAT, which represents the government of Abu Dhabi, owns 70 percent and Consolidated Contractors Company owns 30 percent. The MoU was signed by Sultan Mohamed Al Dhaheri, General Manager, Etisalat Abu Dhabi, and Eng. Ahmed Salem Al

Dhaheri, CEO of NPCC. Eng. Ahmed Salem Al Dhaheri, CEO of NPCC, said: "Technology and digitalization is driving the Fourth Industrial Revolution, bringing much needed efficiencies to oil and gas production. It is transforming the sector with remote sensing, real time data, autonomous vehicles, artificial intelligence and predictive analytics; giving companies a better chance to anticipate and respond. We are pleased to sign this agreement with Etisalat as a service provider of choice to enhance our ICT and digital performance by implementing global best practices and standards". Sultan Mohamed Al Dhaheri, General Manager, Etisalat Abu Dhabi, said: "Our partnership with NPCC, a leading Abu Dhabi based oil and gas EPC contractor, mirrors Etisalat's corporate strategy of focusing on 'Driving the digital future'. At Etisalat, we understand the importance of digital transformation in the oil and gas sector. Today, the oil and gas industry has the opportunity to redefine its boundaries through digitalization. We at Etisalat are working closely with all our customers and partners to transform their businesses by investing in digital services and solutions.



Etisalat wins 'Best Nationalization Initiative' Award in the GCC Private Sector

Etisalat has achieved a milestone with the latest recognition and award, 'Best Nationalization Initiative in the GCC', among its regional peers in the private sector. The award was announced at the 6th GCC Government Human Resources Summit & Awards 2018, organized recently by the UAE Ministry of Human Resources and Emiratisation in Abu Dhabi, and attended by 350 renowned international experts from the global HR industry. Etisalat won the prestigious award as the best company to implement nationalization initiatives from among a shortlist of GCC-based high-profile private-sector companies. The award was announced during the GCC Government HR Summit as part of the 6th GCC HR Awards for government and private sectors. The award was a recognition of

Etisalat's successful implementation of innovative policies and procedures in the employment of UAE nationals, and for incorporating the nationalization plan into its core human capital strategy. It also launched customized programs targeting UAE nationals such as the 'Future Leaders Program' providing Emiratis a platform to become future leaders. Younis Abdul Aziz Al Nimr, Chief Human Resources Officer, Etisalat said: "We in Etisalat are proud to have been recognized for the 'Best Nationalisation Initiative in the GCC' and attain this outstanding achievement at such a prestigious event. This is mainly attributed to the empowerment of UAE nationals at Etisalat through a large number of employment initiatives, which increased the number of Emiratis by 48 percent

across our offices in UAE. Nationalization is part of our core belief and commitment as well as in line with the UAE leadership's goal to increase the employment rate for UAE nationals in the public and private sector. "At our core strategy we have continuously increased the involvement of Emiratis across the company's divisions in the country. Etisalat has also actively participated in all 'Emiratisation' initiatives launched by the government such as the 'Government Accelerator Program' which helped us surpass our 'Emiratisation' target in the first 100 days of 2018." Etisalat has actively participated in the 'Absher' initiative launched by the Ministry of Presidential Affairs and met the required targets within the specified period. As part of the 'Emiratisation' drive, Etisalat also

established call centres in Ras Al Khaimah, Fujairah and Al Al Ain to employ UAE Nationals and meet Emiratisation targets in these areas. Etisalat was involved in conducting 2,025 advanced and medium-level training courses training 6,400 Emirati men and women from January 2015 to December 2017. Since the beginning of this year, more than 1,550 UAE nationals received training spanning 6,290 training days. The company has also increased its localization rates to 48 percent in the last four years, with 74 percent occupying top management positions and 50 percent at mid-management level. UAE women nationals currently form 73 percent of the entire female workforce at Etisalat. The 'Future Leaders Program' was created in collaboration with top global research and academic institutions in which 400 nationals have completed the program



and 103 expected to graduate in the first quarter of 2019.

Etisalat Launches eSIM for iPhone

Etisalat announced the launch of the long-awaited 12.1 iOS compatible eSIM for Apple devices making Etisalat one



of the operators globally to operate the technology. Etisalat first introduced the first generation eSIM technology in May this year for the Apple Watch. With today's announcement of the next generation eSIM, subscribers can now access advanced features of the dual eSIM enabling them to use two mobile numbers on their latest iPhone devices. The new technology also enables subscribers to select an international roaming network

while travelling out of UAE. The unveiling of the second generation eSIM makes Etisalat the first operator in UAE to provide this technology on both iPhones and Apple Watch simultaneously, and comes in line with the telco's efforts to become the region's leading telecom operator in the world, bringing the most advanced technologies and services to be the first choice for subscribers in the UAE.



Omantel Expands FTTH Coverage

Omantel Telecommunications Company (Omantel), the Sultanate's incumbent fixed and mobile operator, has expanded its fiber-to-the-home (FTTH) service to the Al Saadah area in the city of Salalah. Muscat Daily reports that the launch follows expansion to a number of new areas, including Al Amerat, Al Khuwair, Al Khoud Old, Al Musannah and Madinat A'Sultan Qaboos, enabling residents to access broadband speeds of up to 200Mbps and VAS such as Omantel TV+. 'We are happy to announce the launch of our ultra-fast Internet service in Al Saadah, emphasizing our commitment to provide our customers with this important service across the sultanate, which reflects Omantel's leadership in the provision of broadband services having the widest fiber-optic network in the country,' commented Mohammed al Hakmani, Core Services Manager at Omantel's Consumer Business Unit.



Omantel Showcases Its Rich Digital Experience at Annual ICT Summit

Latest technology trends and innovations were showcased at the Annual Omantel ICT Summit 2018. The annual ICT summit was recently held at the Oman Convention and Exhibition Centre (OCEC) under the patronage of Dr. Ahmed bin Mohammed bin Salim al Futaisi, Minister of Transport and Communications. At the event, giant companies including Huawei, Cisco and SAP along with 250 experts in information and communications technology (ICT) as well as the CEOs and decision makers in private and public sectors came under one roof to discuss the fast-paced developments in the digital world, according to a press release. "The ICT is a promising sector that supports the sultanate's transformation strategy toward a highly productive and flourishing digital society. It also enables businesses and

organizations to expand their operations and push the economic, social and cultural developments forward," Futaisi said. He further said, "The world is in a constant race to adopt latest technologies, which have become vital for business development. Bringing in new technologies to the sultanate will certainly boost innovation and economic diversification in the country, and this event is a great platform to know the various investments in this field, including Big Data, Internet of Things and Cloud Computing, that we count on to strengthen Oman's position as an ideal destination for doing business." Talal al Mamari, Chief Executive Officer of Omantel, said that the company is getting ahead in bringing in latest innovative ICT solutions. "We are well on our way to accelerate the complete digital efforts of a

good number of public and private entities. Banks, energy companies, universities and government authorities are partnering with Omantel ICT to accelerate their digital transformation. We also made big strides in the areas of Blockchain and Artificial Intelligence arenas in 2018, with a near-term goal to introduce market accelerators as we evolve faster to a 5G covered nation." Mamari further said, "Omantel is a transformed company in the way we look at our internal processes as well as the services that we offer to our customers. We are working hard to introduce digital ICT services to our individual consumers and families to go beyond the traditional connectivity and classical mobility services. These ICT services aim to make the way families connect with their kids and educators at schools or pay their bills or access specific online softwares easier." "Also, we are providing leading global content providers with advanced ICT services to entice them to use Oman, with our unique geographical location, stability and massive international connectivity investments, as their launching platform when providing their highly sought after content to East Asia, Eastern Africa as well as the larger MENA region," Mamari added. Organized for the second year in a row, Omantel's annual ICT summit sets the ground for a greater collaboration in technology and digital transformation as businesses and public and private organizations come together to hold business talks and ink deals.



Orange Launches Ethernet Now Service to Deliver On-Demand and Real-Time Ethernet Connectivity

Orange has announced the launch of Ethernet Now for wholesale customers to better manage their Ethernet connections through a simple, user-friendly and secure on-line portal. The service, available from early 2019, will have no territorial restrictions and all international customers will be able to benefit from the service when it is launched. Services will connect to all PoPs (more than 70) on the Orange

MPLS network internationally (Europe, US, Asia, Africa, the Middle East). It will launch as part of the company's drive to develop its portfolio of connectivity services with 'self-service' online order management capabilities with SDN technology to provide wholesale customers with a fast, flexible and efficient connectivity solution. Orange says Ethernet Now benefits customers with vastly reduced delivery times to the

extent that services are available in near real-time. The service will also enable the online, real-time purchase of point-to-point Ethernet circuits over Orange's IP network. It is accessible via the Orange customer portal and by entering the basic criteria of location, bandwidth, and duration of the engagement customers can request a price quotation, order a new link or make a change to an existing

contract, in a matter of minutes. Through its wholesale arm, International Carriers, Orange says it aims to provide the best digital customer experience tailored to specific needs in today's increasingly demanding environment and Ethernet Now offers speed and convenience with this digital interface. By significantly reducing call processing and circuit delivery times, Ethernet Now will enable customers to oversee contracts and carefully manage connectivity costs. In addition, the solution offers greater management flexibility thanks to a new daily pricing model without the need for extra contractual commitment. Furthermore, customers will benefit from responsiveness, agility and flexibility when connecting to data centers around the world. Orange says it is at the forefront of network-transformation and Ethernet Now is a major step in the transformation program towards innovative SDN and NFV networks. Software Defined Networking (SDN) and Network Functions Virtualization (NFV) are revolutionary technologies that enable programming and automation of network operations to optimize network management and better serve customers' expectations. They bring greater flexibility and reduced delays to service activation. Orange is working to ensure the best quality of experience for



its wholesale customers and as a major contributor to open-source communities and standardization bodies, Orange is reconfirming the group's ambition to extend the benefits of these technologies to its wholesale customers with the launch of Ethernet Now. Orange claims to be the only Tier-1 wholesale operator to have four Points of Presence (PoPs) in the Africa-Middle East region in Abidjan, Johannesburg, Cape Town and Amman. With more than 150 Bandwidth PoPs, and more than 70 IP PoPs, Orange also has new PoPs in Spain, the USA, France and

the Netherlands. These new POPs serve to strengthen the Orange footprint for IP services, including Ethernet connectivity services. Pierre-Louis de Guillebon CEO Orange International Carriers, said: "In today's challenging market place, satisfied customers mean the difference between success and failure. Wherever possible, we need to anticipate customers' needs as they evolve so keeping customers happy is the foremost priority for Orange International Carriers. When Ethernet Now is launched in early 2019, we fully expect to see our business expand further."

Orange Egypt Rewards Winners in Start-Up Competition

Orange Egypt announced the winners of the Orange Startup Cup Competition 2018, which aims to promote entrepreneurial initiatives in Egypt and raise awareness of the resources available to grow entrepreneurs. Orange rewarded the top five winning teams with fund seeding of

EGP 300,000 each. The competition kicked off in March with a total of 136 males and females, representing 100 projects. These were then filtered down to 25 promising projects. Forty-one trainers and mentors have participated in training and qualifying the contestants to provide them not only

with the necessary expertise to help them penetrate the markets but also to keep their presence in the market. Then the projects were again reduced to twelve teams, after which the best seven teams were selected to reach the final stage.



Orange Accelerates its Multi-Service Operator Strategy in Africa

In the field of telephony as in many others, Africa has jumped a technological step by moving directly to mobile. The outlook of the smartphone market is still seeing exponential growth. It is estimated that at least 660 million Africans (against 336 million in 2016) will be equipped with a smartphone by 2020. This breakthrough can be explained by several factors, led largely because Orange (www.Orange.com) is fully mobile: it has established mobile payment services (via the Orange Money service), it continues to invest in mobile internet coverage (14 Orange countries with 4G) and it offers affordable prices to provide accessibility to all. On this last point Orange continues to innovate today by partnering with KaiOS Technologies to democratize access to digital services in Africa. Beginning 2019, Orange customers in Africa will have access to a new category of smart feature phones powered by KaiOS, the operating system from KaiOS Technologies, that is creating an emerging ecosystem of digital

products and services at an affordable price. In addition, customers will be able to use Google's digital assistant – the Google Assistant – in French, English and Arabic to help overcome language and literacy challenges. The first product to launch will be a 3G smart feature phone, followed by a 4G version later next year. The new phones will allow access to in-demand apps like Twitter, Facebook, You Tube, Google Search, Google Maps and the Google Assistant. It comes at an affordable price as a smart feature phone with advanced smartphone-like functionalities. This offer will be available in almost every country where the Group is present. Of all the digital revolutions, e-learning is arguably one of the most transformative for Africa. Online education will make it possible to train the millions of professionals the continent needs to take charge of its development. Through its "African Digital School" program, Orange aims to mobilize its infrastructure, access and expertise to help Africa rise to the challenge of training

young people, especially in digital growth sectors. The first partners of this program are major French institutions, like the CNED and the University Institutes of Technology, and the startup OpenClassrooms for IT lessons. Today, Orange announces a new partnership with the Virtual University of Tunis, the world pioneer in online education, which has provided digital training to all Tunisian students for over a decade. The partnership aims to support access to their courses and training in the African countries within Orange's footprint. A similar partnership will be signed in December with the Virtual University of Senegal, another leader in online training in Africa. For the 8th year running, Orange will award its "Orange Social Entrepreneur Prize in Africa and the Middle East" at the AfricaCom Awards. This competition aims to reward the best projects by African startups that help improve the living conditions of local people through digital, in fields such as education, healthcare, farming, mobile payments or sustainable development. The two-part competition was held in 17 countries where Orange operates. During the first stage, out of 1,304 applications received, 49 innovative projects were chosen as winners and rewarded in the relevant country. Then 10 projects were selected and presented to an international jury made up of professionals, investors and institutions. fOrange is present in 20 countries in Africa and the Middle East where it has 119 million customers (Q3 2018). Generating €5 billion in sales in 2017, this zone is a strategic priority for the Group. Orange Money, its mobile-based money transfer and financial services offer is available in 17 countries and has 40.2 million customers. Orange, a multi-service operator and benchmark partner of the continent's digital transformation, provides its expertise to support the development of new digital services in Africa and the Middle East.





Telecom Egypt Reports 32% Increase in Revenue for 9M18

Telecom Egypt generated consolidated revenues of EGP17.358 billion (USD967 million) for the nine months ended 30 September 2018, representing a 32% year-on-year increase, which the operator said was 'fuelled by the inclining pace of data services and the contribution of the deal sealed with Bharti Airtel of EGP1.6 billion'. Telecom Egypt's EBITDA in 9M18 totaled EGP5.329 billion, up 36% against the corresponding period a

year earlier, bolstered by the increase in revenues, with operating income rising by 16% to EGP5.132 billion. Net profit in the nine-month period under review stood at EGP3.506 billion, up marginally from the EGP3.483 billion recorded a year earlier. In operational terms, just over a year on from its entry into Egypt's mobile market, Telecom Egypt reported a wireless subscriber base of 3.589 million at end-September 2018, up ten-fold from 352,000

a year earlier. Fixed broadband subscribers, meanwhile, numbered 4.968 million (3Q17: 3.839 million), with the lion's share of those – 4.714 million – being residential connections. Fixed voice lines in service also continued to increase, reaching 7.589 million at the end of the reporting period, up from 6.913 million at end-September 2017.

Telecom Egypt Signs US\$500 Million Medium-Term Syndicated Loan

Telecom Egypt has signed a USD 500mn medium-term syndicated loan, which will be used to support its capital and operational expenditure, and refinance an existing short-term facility. First Abu Dhabi Bank PJSC (FAB) and Mashreq Bank PSC (Mashreq) were mandated as Joint Bookrunners and Mandated Lead Arrangers of the facility. FAB is the facility agent for the transaction and Mashreq Bank is the designated Account Bank. Ahmed El Beheiry, Managing Director and Chief Executive Officer, commented: "Telecom Egypt's USD 500mn medium-term syndicated loan was

1.46x oversubscribed, which reflects the confidence of the respected international financial institutions in the company's financial and operational strength. Telecom Egypt has previously announced that its board of directors approved obtaining the 5-year syndication arranged by First Abu Dhabi Bank and Mashreq Bank on 10 May 2018. The aim of the facility is to convert our short-term USD overdrafts into longer-term loans to enable the company to repay installments in line with its cash flow generation. The facility will also ensure the flexibility to finance Telecom Egypt's working capital needs as

well as to invest in its 4G infrastructure. The facility comes in line with our financing strategy, which is to enhance and reduce the financing expenses incurred and drive growth by contributing to the launch of mobile services, the overhauling of the fixed internet infrastructure in Egypt, and the expansion of Egypt's international network. This will enable our vision of turning Egypt into a digital route and a regional hub to host international content developers in addition to our new direction to expand in IoT services."



Viva Agrees to Purchase Qualitynet

Mobile operator Viva Kuwait has signed an initial agreement to purchase the entire share capital of Kuwaiti ISP Qualitynet from current owners Batelco and National Bank of Kuwait (NBK), reports Forbes Middle East. Bahrain-based Batelco entered the ownership of the Kuwaiti fixed broadband operator in 1999 and took majority control in 2014, but has now reached a share transfer agreement with NBK and Viva

(controlled by Saudi Telecom Company) with a deal price to be established upon completion 'subject to satisfaction and fulfillment of certain conditions', and pending the necessary regulatory approvals. According to Batelco's 2018 half-year financial results announcement, Qualitynet gained two large lucrative customer contracts in Q2.



VIVA Reports KD 37.4 Million (US\$123.15 Million) Net Profit; a Growth of 29.8% during the Nine-Month Period Ended September 30, 2018

VIVA, Kuwait's fastest-growing and most developed telecom operator, announced the financial results for the nine-month period ended 30 September 2018; whereby VIVA's net profit grew to reach KD 37.4 million recording growth of 29.8% compared to the same period in 2017. Whereas the revenues during the first nine-month period of 2018 reached KD 214.8 million recording a growth rate of 2.6% compared to the same period in 2017. These results reflect VIVA's focus on achieving outstanding customer experience, high quality of services, innovative promotions and solutions to meet its customers' needs and aspirations, inspired by their confidence which motivates us to provide the best services with the highest possible quality. Commenting on the nine-month's financial results, Dr. Mahmoud Ahmed Abdulrahman, VIVA's Chairman said: "Despite the high competition witnessed in Kuwait Telecommunication Market, VIVA was able to achieve growth in profitability and revenues to sustain the operational efficiency to ensure generating positive return to our shareholders. These Results were achieved by an integrated management approach from a highly professional team that promotes VIVA's substantial and positive role as a leading telecommunications company that always provides intelligent communications solutions to meet its customers' needs". He added: "VIVA has demonstrated its ability to achieve growth in the net profit amid the current fierce conditions in Kuwait Telecommunication sector and the decline in telecom tariffs thus pressurizing the growth of revenues. VIVA managed to achieve net profit of KD 37.4 million (earnings per share of 75 fils) during the nine month period ended 30 September 2018 compared to net profit of KD 28.8 million (earnings per share of 58 fils) during the same period in 2017." Eng. Salman bin Abdulaziz Al Badran, VIVA's CEO said: "Results of the nine-month period ended 30 September 2018 came in line with VIVA's goals and boundless ambitions to achieve an increase in its operational revenues, profitability and strengthen its leadership in the telecommunication market. It is noteworthy to mention that, VIVA has won many awards including "Leading Corporate for Investor Relations in Kuwait" and third in the Middle East by MEIRA, "Best Network Development" in the MENA region presented at the third annual 5G MENA Awards 2018 Ceremony, "Speedtest Award Winner 2017 – Kuwait's Fastest Mobile Network" by Ookla, launched Voice over Long Term Evolution Plus 'VoLTE Plus' technology, and was the first telecom company in Kuwait that has physically demo its "5G" services to its customers." He



Dr. Mahmoud Ahmed Abdulrahman, VIVA's Chairman

added: "VIVA has achieved good levels of revenues and increase in the profitability which improved the company's financial and operational efficiency. As a result, VIVA recorded revenues of KD 214.8 million during the nine-month period in 2018 and achieved net profit of KD 37.4 million recording growth of 29.8% compared to the same period in 2017, whereas EBITDA reached KD 57.7 million compared to KD 48.5 Million during the same period in 2017. On the other hand, VIVA customer base has reached 2.20 million at the end of September, 2018". Mr. Mohammed Bin AbdulMohsen Al-Assaf, VIVA's CFO, said: "VIVA's financial results reflect its ability to compete, sustain revenues and maintain its position as the second largest telecom operator in the Kuwaiti market in term of market share in the telecommunication sector. Al-Assaf said," we started to observe the impact of the cost optimization program adopted by the company during the current year on profitability, as the company adopted a balanced and effective financial policy in managing CAPEX and operating expenses". He added: "We will continue our hard work in implementing our strategy to maintain our competitive edge and achieve further growth and success in the Kuwaiti telecom market through offering innovative products and services in line with the latest technology to meet our customers' needs".



Zain Group Revenues Up 55% in Q3 on Saudi Consolidation

Middle East mobile operator Zain Group said its revenues increased by 55 percent to KWD 403 million in the third quarter, and EBITDA reached KWD 155 million, an increase of 48 percent year-on-year, giving a 38 percent EBITDA margin. The growth was supported by

Zain Saudi Arabia becoming a consolidated subsidiary during the third quarter. This contributed an additional USD 521 million in revenues and USD 194 million in EBITDA for Q3 2018.

Zain Launches BEAM Home Wireless Broadband; Signs Cloud Partnership with Microsoft

Zain Kuwait has launched an LTE-based home broadband internet service under the 'BEAM' brand, promising download speeds of up to 40Mbps, the Kuwait Times reported. Two post-paid BEAM packages both offer unlimited data (20Mbps for KWD25 or 40Mbps for KWD40 monthly) on a 24-month contract, whilst Zain customers also get a free BEAM home router and complementary portable LTE Hotspot device with free 50GB monthly data. Installation is also free. Coverage for the BEAM service initially includes 'areas between the first and fifth ring roads' of Kuwait City, with additional areas to be added in due course. Zain Kuwait has also announced a partnership agreement with Microsoft to offer various cloud-based services to large enterprises and SMEs, reports Arab Times Online. Under the partnership, Zain will combine its own products and services with Microsoft's cloud solutions into one offering, with the aim of enabling businesses 'to drive digital transformation by better engaging their customers, empowering employees, optimizing operations and transforming their products and services'.

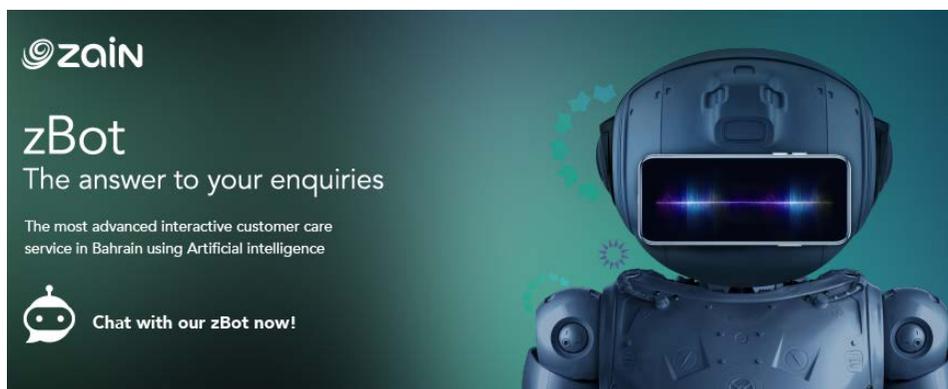


Zain Bahrain Launches First Interactive Smart Customer Service Solution zBot

Zain Bahrain announced the launch of zBot, an all-new interactive digital channel for smart customer service, making it the first telecoms operator to launch this innovative solution in the Kingdom. The launch of zBot falls in line with Zain's strategy to deliver an exceptional customer experience, investing in robotics technology within the customer care area to provide its customers with a reliable and fast Live Chat service where customers inquiries can be answered and fulfilled in a fully automated manner without the need of human interaction. zBot utilizes robotics

and the latest Artificial Intelligence (AI) and Natural language processing technologies (NLP), making it one of the most advanced customer service solutions. Available 24/7 in English language, the new zBot interactive channel offers its customers a range of fully automated services via Zain Bahrain's portal and mobile application, including post-paid billing inquiries, pre-paid inquiries, mobile data usage details, the latest offers and promotion plans, managing accounts, purchasing smart devices from the online store and information on branch locations

and opening hours, in addition to many unique features. Commenting on the launch, Shaikh Ahmed bin Ali Al Khalifa, Zain Bahrain Chairman, said: "We are witnessing growing adoption across our digital channels in general and specifically the mobile application and live chat service, and thus we came up with this new addition to continue delivering superior customer experience." "zBot is a technologically advanced interactive customer care service which responds to the customers' inquiries in a reliable and fast manner. Zain Bahrain is fully committed to continue its efforts in enriching our customer experience, offering them alternative solutions and platforms to fully service their needs and upscale their satisfaction rates and customer experience," Shaikh Ahmed added. Zain always aspires to new levels of excellence in all services it offers to its customers. Through the launch of this innovative channel, Zain affirms its continuous efforts in meeting its customers' needs and aspirations, as well as delivering its promise to offer the best services and latest technologies.



Zain Selected by Huawei to Offer Huawei Cloud Services in Kuwait and MENA

Zain Group, the leading mobile telecom innovator in eight markets across the Middle East and Africa, has been selected by Huawei, a leading global provider of information and communications technology (ICT) infrastructure and smart devices, to become a strategic partner in the offering of HUAWEI CLOUD services in Kuwait and across the Middle East and North Africa region (MENA). The Memorandum of Understanding (MoU) between the two companies was signed during a two-day strategy summit held in Shanghai, China where Zain Group executive management met counterparts from Huawei to discuss a range of topics related to establishing additional areas of potential cooperation. The public cloud agreement is in line with the New Kuwait Vision 2035 and the strategic relationship established between Kuwait and China to drive improvements in the areas of Public Administration, Economy, Infrastructure, Living Environment, Healthcare, Human Capital, and Global Position. The agreement will see HUAWEI CLOUD services initially launched in Kuwait and across Middle East, with a wide range of new offerings being made available to businesses and consumers alike. The market in MENA is estimated to be growing by more than 20 per cent year-on-year according to industry analyst Gartner, with platform as a service (PaaS) and software as a service (SaaS) being among the fastest growing areas with public cloud service delivery. Commenting on the entering the public cloud MoU with Huawei, Zain Group Vice-Chairman and CEO Bader Al-Kharafi said, "This agreement bolsters Zain's efforts in playing a key role in the 'New Kuwait 2035' national development plan as the deployment of public cloud services unlocks many opportunities for driving business

growth and efficiency, as well as stimulating competition and innovation. It also enhances our ambitions of becoming the operator of choice for governments and enterprises of all sizes across our footprint." Al Kharafi continued, "In the implementation of our digital transformation strategy, Zain has consistently looked to bring cutting-edge solutions to the region for the benefit of its customers. In recent years we have intensified our focus on the delivery of business-to-business (B2B) solutions, and this agreement adds to the comprehensive range of business-critical offerings we'll be able to deliver." "Public cloud is the cornerstone of digital transformation, I look forward to promoting HUAWEI CLOUD across the MENA with Zain", said Charles Yang, President of Huawei Middle East, "As a global leading ICT player, Huawei will continuously focus on digital transformation, supporting our strategic decision to foster the growth of public cloud services. Zain is one of our most important partners in the region and this partnership will support the realization of Kuwait 2035 vision and other MENA nations' plans alike, bringing digital to every person, home and organization for a fully connected and intelligent MENA." Zain and Huawei discussed other topics during their summit in Shanghai, including each company's respective technology roadmap given the introduction of 5G in the MENA region as early as next year. The companies assessed the expected business cases for 5G in the region, including its impact on IoT, mobility, connectivity, healthcare, government; and other essential sectors. Zain is on track to have its operations in Kuwait and Saudi Arabia be the first to launch 5G commercially. Furthermore, Zain and Huawei discussed the opportunities of innovative B2B services that is a growth engine for Zain, serving the entire spectrum of customers, from Small Office, Home Office (SoHo) companies to large corporations and government entities with dedicated B2B units. In developing these opportunities, Zain is evolving from being a mobile centric operator to a full-service ICT player, advancing innovative mobile, fixed-mobile, fixed, IoT, IT security and Cloud-based solutions to private and public-sector organizations. Enterprises typically require solutions that offer greater flexibility, connectivity, scalability, security, and processing power, as well as an ability to be accessed from locations around the world. Given Zain's expertise and synergies between its operations, Zain aptly offers B2B solutions helping governments and organizations of all sizes with specialized products and services aimed at meeting their unique needs.



Zain Bahrain Witnesses a 32% Rise in Its Net Profit in 2018

Zain Bahrain, a leading telecommunications provider in the Kingdom announced the firm's financial results for the nine-month period ending September 30, 2018. The company recorded a net profit of BD 3.685 million (US\$9.749 million), up 32% from BD2.799 million (US\$7.405 million) when compared to the same nine-month period in 2017 as result of the company's improved

operational performance. Net profit in the third quarter of 2018 (Q3) reached BD1.353 million (US\$3.579 million), up 0.4% year-on-year from BD1.348 million (US\$3.556 million), despite an 8.6% decrease in revenue year on year (Y-o-Y) from BD17.496 million (US\$46.286 million) to BD15.994 million (US\$42.312 million) when compared to Q3 2017. Earnings

per share increased to 10 fils (previously 8 fils) for the nine months ending 30 September 2018, while the earnings per share were 4 fils for the three months ending 30 September 2018 matches the earning per share achieved in the same period for the three months ending 30 September 2017. Overall revenue year to date was down 10.7% Y-o-Y to BD48.693

million (US\$128.817 million) in 2018, from BD 54.527 million (US\$144.251 million) in 2017. Operating profit for Q3 2018 amounted to BD1.331 million (US\$3.521 million), a decrease of 5.7% from BD1.411 million (US\$3.733 million) when compared to Q3 2017. Nevertheless, operating profit for the year to date was up 22%, to reach BD3.655 million (US\$9.669 million) from BD 2.994 million (US\$7.921 million) when compared to the same period last year. Zain Bahrain's total equity stood at BD 68.724 million (US\$181.81 million) at the end of Q3 2018, up 4.8% Y-o-Y compared to BD 65.603 million (US\$173.553 million) in Q3 2017. The company's assets amounted to BD 96.619 million (US\$255.606 million) at the end of Q3 2018, down 3.9% Y-o-Y from BD 100.490 million (US\$265.847 million) in Q3 2017. Commenting on the achieved results, Zain Bahrain Chairman, Shaikh Ahmed bin Ali Al Khalifa said, "Throughout 2018, we remained focused on improving operational performance and implementing cost efficiency initiatives, in order to drive our innovation-driven business strategy, geared to future-proofing the organization. These combined efforts have contributed to the

positive financial results released today, an achievement which is reflective of Zain Bahrain's continued efforts to maximize its prominent market position. Shaikh Ahmed continued, "Zain Bahrain's efforts to create modern solutions and provide connectivity for our customers across the Kingdom has been given a boost this year with our comprehensive network expansion, providing an improved experience for our customers in the Kingdom. As ever, our commitment remains to deliver state-of-the-art connectivity solutions that enable our customers to stay connected to what they care most about."

Key achievements for Zain Bahrain in 2018

In 2018, the Zain Bahrain network was expanded by 20% across the Kingdom, improving both indoor and outdoor connectivity experience for users. This achievement is a reflection on its ability to keep abreast of the technological and services developments witnessed by the telecommunications sector around the world. Zain Bahrain has been recognized as the fastest network for the highest download speed in fixed wireless broadband in the Kingdom for two consecutive

quarters by the Telecommunication Regulatory Authority (TRA). According to the latest TRA Quarterly Fixed Broadband Quality of Service Report, Zain Bahrain achieved the highest results for HTTP download speeds for fixed wireless broadband residential packages, while also outperforming its previous results in a number of key performance indicators (KPIs). Zain Bahrain also became one of the first operators in the region to upgrade its Quality Management System (QMS) to meet the new ISO 9001:2015 standard, while also conforming to the existing ISO 27001:2013 standard in March 2018. huZain was also awarded the 'Best Brand for Telecom' accolade for 2018 at the prestigious Telecoms World Middle East Awards gala event held in Dubai in September 2018. This marked a record fifth consecutive year that Zain has won the award, recognizing the company's outstanding performance in key telecom-related areas throughout the Middle East. The event shines a spotlight on leading telco players that have contributed to making the sector one of the most dynamic globally.



CFOs Play a Growing Role in Digital Transformation: Accenture

Chief financial officers at banking and insurance companies are playing an increasing role in digital transformation through leveraging new data and analytic technologies and by assuming greater influence in decisions about technology investments, according to new research from Accenture. The research published in two reports – one for the banking industry and one for the insurance industry – surveyed more than 700 CFOs and senior finance executives, including 97 in insurance and 146 in banking. Accenture conducted qualitative interviews with dozens of CFOs, senior finance executives, CEOs and chief data officers. Three quarters of the banking and insurance CFOs surveyed said driving business-wide operational transformation is within their purview (77 per cent in banking and 74 per cent in insurance). From the report,

82 per cent in banking and 81 per cent in insurance see identifying and targeting areas of new value across the business as one of their main responsibilities. Steve Culp, a senior managing director at Accenture said, "Banking and insurance CFOs are at the center of the organization, working alongside the CEO, acting as the economic guardian to ensure that the digital transformation strategy is effective across the entire enterprise. "By leveraging predictive analytics and artificial intelligence to better interpret data for key business decisions, CFOs can drive value, improve efficiency and enable strategy beyond the borders of the finance function." Both reports highlight that CFOs are playing a crucial role in digital investments, 75 per cent of the CFOs surveyed are leading efforts to improve efficiency through the adoption

of digital technologies and exploring how disruptive new technologies could benefit their organization. It also shows finance is taking a lead role in data and analytics, the research noted CFOs biggest potential strength is the ability to harness data to increase the efficiency and effectiveness of not just the finance function, but the entire organization. Banking finance executives are more likely than those in other industries to provide proactive analysis of future business scenarios throughout the organization according to 40 per cent of banking CFOs. Insurance CFOs are significantly more likely than those in other sectors to say that finance should take a leading role in identifying and managing control of the most critical data cited by 57 per cent of insurance CFOs. The report also showed there are challenges finding finance talent with

data and analytics skills. Banking CFOs said that the ability to analyze data is a core requirement of their role, 41 per cent said they consider data science one of the most important skills that junior finance executives can have. Meanwhile, insurance CFOs believe that their companies are more likely than those in other sectors to have financial talent shortages that prevent them from achieving their business-wide strategic ambitions. Culp said, "Financial services CFOs are increasingly performing a difficult balancing act between managing risks and unlocking value. "The use of data and the broader adoption of digital technologies offer an extraordinary opportunity, but only if the finance team — and the broader organization — have the talent, skills and resources to capitalize on them."



Airspan Networks Acquires Mimosa Networks

Mimosa's acclaimed capabilities and innovation in wireless broadband point-to-point and point-to-multipoint networks strengthens Airspan's award-winning, disruptive position in the Mobile 4G/5G network densification space and expands Airspan's existing North American presence with an engineering center in Silicon Valley. The deal strengthens Airspan's innovative leadership in 5G network infrastructure by leveraging the combined teams' technologies and products, sales channels and customer base, driving next-generation wireless solutions into a broader set of market opportunities. Airspan's global customer base includes Mobile Operators, Cable/MSO's, CSP's, Wireless ISP's and private network operators in public safety,

utilities, oil and gas and air to ground. Airspan is also the only major American network infrastructure company to offer 5G solutions to a worldwide market. Airspan will continue to leverage the robust Mimosa channel-led sales strategy. This channel strategy will also be used to enhance the distribution of Airspan's existing products for specific vertical markets, such as private LTE and applications in the newly available CBRS spectrum band. "This important step in Airspan's growth emphasizes critical new solutions in mobile and broadband and the addition of the Santa Clara team strengthens our capabilities in the disruptive massively scalable densification techniques that are required by the 4G/5G telecom expenditure cycle currently underway. Mimosa brings important intellectual property to the table and accelerates Airspan's path to delivering 5G features such as Massive MIMO to the industry" said Eric Stonestrom, CEO of Airspan. "Furthermore, Mimosa's disruptive and award-winning fixed wireless technology addresses the rapidly growing wireless broadband markets and further establishes Airspan as a leader in the convergence of densified 4G/5G mobile network backhaul and Broadband Access. Also the strong distribution channel allows Airspan products to be sold to many more customers. We are excited to welcome the Mimosa team into the Airspan family. This acquisition will bring an immediate diversity to our customer base, vertical markets, product portfolio, development centers and sales channels, and places Airspan in the heart of Silicon Valley 5G application innovation."

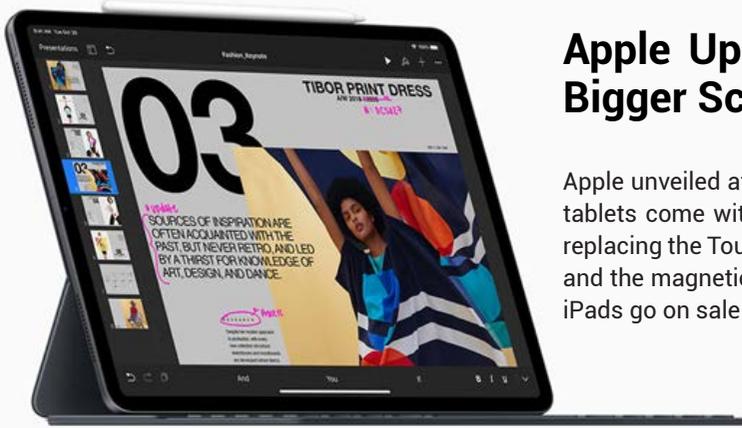
Proud to Welcome Mimosa's
Award-Winning Team and
Products into the Airspan Family



Apple Quarterly Results Better Than Expected, Sees Q4 Sales Up Around 30%

Apple reported better-than-expected sales growth for its fiscal fourth quarter to September. Revenues rose 20 percent year-on-year to USD 62.9 billion, and quarterly earnings improved

41 percent to USD 2.91 per share. For the current quarter to December, Apple forecast revenues of USD 89-93 billion, up around 30 percent from USD 88.3 billion a year ago.



Apple Upgrades iPad Pro with Faster Chip, Bigger Screen, Face ID

Apple unveiled at an event in New York an updated version of its iPad Pro. The tablets come with the new Liquid Retina displays, a faster processor, Face ID replacing the Touch ID to unlock the device, a new USB-C Connector, gigabit LTE and the magnetic Apple Pencil. Available in 11- and 12.9-inch models, the new iPads go on sale 07 November in stores.



Arabsat Signs MoU to Boost Data Protection

Arabsat has agreed a MoU with RigNet to provide data protection across its MENA satellite network. In the agreement RigNet and Arabsat will target the immediate and growing cybersecurity threat of satellite eavesdropping and network data breaches. Arabsat will begin offering RigNet's CyphreLink to provide military-grade encryption for location to location communications over satellite and terrestrial networks.

The hardware-based encryption enables military-grade data security, with little to no overhead on the payload. CyphreLink prevents eavesdropping and potential data breaches. "Arabsat is committed to providing its customers with the most secured connectivity," said Khalid Balkheyour, President/CEO Arabsat. "We are determined to accelerate our efforts to provide managed cybersecurity solutions in the region, and with the growing cyber

threats, RigNet was the natural partner, providing the industry's best cybersecurity solution." Arabsat also announced a scheme with Forsway to roll out "affordable satellite broadband services" across Africa. Arabsat says the plan is to "Bring internet access to developing markets, starting from \$5 per month and providing up to 10GB of satellite broadband – to help reduce the digital divide." Arabsat and Forsway will use the BADR-7 satellite.

Arabsat Broadband Services and Forsway Team Up to Roll-Out Affordable Satellite Broadband Services across Africa

Arabsat, one of the world's leading satellite operators, and Forsway, a global specialist in providing innovative satellite broadband solutions announced the deployment of affordable satellite broadband services across Africa under the new Arabsat Broadband package. In their first collaboration for Africa, the partners have teamed up to create a managed resource to deliver highly affordable broadband based on Arabsat capacity and hardware from Forsway. The regional service model was designed and implemented by satellite services consultants at Developing Infrastructure. In partnering to provide broadband to underserved regions, the companies are bringing together the

unique combination of resources and expertise to help foster growth across the continent. Internet services will provide critical access to community services, education, health information, business opportunities, entertainment and more. "The Arabsat Broadband model will enable increased capacity for broadband and minimizing network congestion to provide great customer experience with faster internet access, at reduced costs. The joint service model is powered by Forsway customer premises equipment, and Arabsat's BADR-7 satellite to enable connectivity in both hard-to-reach and urban areas in the Middle East and most of Africa," said Wael Mohammed AlButi,

VP & CCO of Arabsat. Tobias Forsell, CEO, Forsway: "We are excited to be working with Arabsat, a leading satellite operator, to create a new way of delivering highly cost-effective broadband services in Africa. Tapping Forsway's hybrid technology, we are helping Arabsat Broadband Services enable rapid deployment of robust, satellite-based internet services and eliminate the need to deploy costly additional infrastructure. The Forsway Odin F-50 technology is furnishing Arabsat Broadband Services with a competitive, low-cost alternative to VSAT for the new Arabsat Broadband service model and offering."



BT Launches Direct Connectivity to Google Cloud in US and Europe

BT announced the launch of a new service to provide organizations with simple, direct and fast access to Google Cloud Platform. BT Cloud Connect for Google Cloud gives customers direct connectivity with interface speeds varying from 50 Mb/s to 2Gb/s. A resilient pair of high-performance connections means access to Google Cloud Platform services comes with more security, higher availability and with better consistency compared to connecting over the open internet. The service is currently available at Google Cloud's Ashburn and Chicago points of presence in the US, as well as in Frankfurt, Germany and London, helping organizations based in those regions optimize performance and

meet compliance requirements. The new service complements Google Cloud's Partner Interconnect, a service which offers enterprises access to Google Cloud Platform from anywhere in the world. The service builds on BT's global network reach, spanning 198 countries and territories. It is designed, implemented and supported as part of the customer's existing network infrastructure. This means less redesign, less change and more consistency with existing network practice when connecting to new cloud services. According to, John Veizades, Product Manager, Google Cloud: "Partner Interconnect gives Google Cloud customers even more connectivity choices for hybrid environments. Together with BT,

we are making it easier for customers to extend their on-prem infrastructure to the Google Cloud Platform". According to, Neil Sutton, VP Strategy and Strategic Alliances, BT: "It's the latest development in our Cloud of Clouds approach, which has seen us invest in direct links to all of the world's leading hyper-scale cloud platforms. It offers customers a comprehensive choice of cloud services providers and value-added services such as Check Point firewall, Connect Intelligence Riverbed and Connect Intelligence InfoVista, which provide security and end-to-end applications visibility, control and acceleration from branch sites to where data is hosted in the cloud."

BT Claims Positive Momentum in First Half

BT said it continued to generate positive momentum in the second quarter after reporting a 2% rise in adjusted EBITDA for its first half, thanks in part to restructuring-related cost savings. The UK operator said that based on current trading it also expects EBITDA for 2018/19 to be in the upper half of its £7.3-£7.4 billion range, news that helped its share price to rise by more than 10% in morning trading. Outgoing CEO Gavin Patterson said: "We are successfully delivering against the core pillars of our strategy with improved customer experience metrics, accelerating ultrafast deployment and positive progress towards transforming our operating model." BT said its transformation program is "on track" with roughly 2,000 jobs cut in the first half of its financial year, the largest proportion of which came from its Global Services division. BT said it will make overall annualized savings of £350m from the program with an associated cost of £206m. BT Group also completed the transfer of 31,000 employees to infrastructure arm Openreach on October 1, marking the final step in creation of a more independent, legally separate business. BT said Openreach is currently building fiber-to-the-premises (FTTP) to roughly 13,000 premises each week and has passed nearly two million ultrafast homes and businesses. "In Consumer, we continue to see strong sales of our converged product, BT Plus, and have seen good mobile sales following new handset launches," said Patterson. "Last month EE demonstrated 5G capability from a live site in Canary Wharf. We have maintained momentum in our enterprise businesses despite legacy product decline." On the



TV front, BT announced yesterday that it has agreed a long-term extension to its content supply agreement with Sky. As part of the new deal Sky will become BT's exclusive distribution partner in Ireland. BT said that audience figures continue to grow across its TV and digital platforms. In sports, the UEFA Champions League group stages saw a 46% increase in viewing figures compared to the same matches last season, while BT's current Premier League average audience is up 9% year-on-year. Overall, for the half year to 30 September 2018, BT reported profit before tax of £1.34bn and adjusted EBITDA of £3.68bn. Reported revenue was down 2% at £11.59bn and adjusted revenue was down 1% to £11.62bn as growth in BT's consumer business was offset by regulated price reductions in Openreach and declines in its enterprise businesses.



Bubbletone and SIMYO to Launch a Pilot Project

Bubbletone and SIMYO, a major MVNO in Spain, have signed a memorandum of understanding to establish a partnership and implement a pilot project regarding the use of blockchain technology in commercialization of telecom services – abroad communications mobile products for Spain incoming roamers. According to the memorandum, the companies will establish a working group of designated responsible persons for research, development, and advancement of the blockchain pilot project. The group will set up an experimental zone for the “Distribution of prepaid mobile services with zero acquisition cost” use case. Within this case, SIMYO’s specialists will be able to publish offers on the blockchain platform for Spain incoming roamers. To test these offers, SIMYO’s node will be integrated with internal systems and the platform. The case will also include testing with SIM cards, demonstration of mobile profiles interactions and engagement with value-added services. “It’s a pleasure to announce that we are launching a pilot project with SIMYO – a major Spanish MVNO operator built on the Orange España network, a prominent Spanish mobile network operator. Thanks to this pilot, in the nearest future the platform members’ end users will get an opportunity to purchase mobile service packages for Europe at affordable prices and SIMYO will be able to expand its client base and increase revenue”, said Yuri Morozov, CEO and Founder of Bubbletone Blockchain in Telecom. “SIMYO is convinced that Blockchain is



a key technology for the present and for the future; especially in the Telecom Market. New business opportunities are appearing based on Blockchain and SIMYO will be in the state of art for these new operations accordingly with our innovative approach in product development. This pilot project with Bubbletone will help us to explore how to spread our commercial offering abroad, to new customers coming to visit Spain”, said Jesus Noguera, CEO at SIMYO.



Cisco, Data Mount Deal for Oman Data Center

Cisco has signed a memorandum of understanding with Data Mount, a hosting company in Oman, agreeing to supply hardware, networking equipment, as well as managed cloud and security solutions for the country’s largest data center, currently being built in Jebel El Akhdar, 150km (93 miles) from the capital of Muscat. Data Mount will use the facility to offer disaster recovery and cloud services – the latter is a new addition to



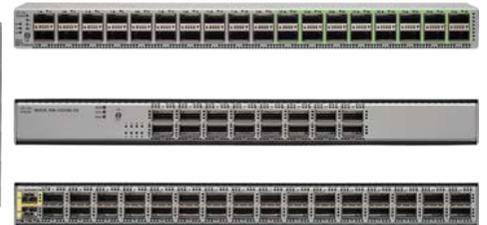
the company’s offering, which traditionally included wholesale colocation and managed data center services. Cisco will supply the underlying technologies. The data center will serve government and enterprise customers, with “a strong focus on the banking industry,” Data Mount’s deputy chairman, Al-Muslahi, told TradeArabia. He added: “Cisco, as a global technology leader and an expert in intelligent data center technology, is the perfect company to help us in this project. We look forward to working closely with them and leveraging their knowledge, expertise, innovative technologies, best practices and skilled resources.” The introduction of cloud services, Al-Muslahi said, is in line with the Digital Oman Strategy, originally set out by the Sultanate in 2008, which aims to diversify the country’s economy - mostly reliant on oil and gas exports, though it has a growing tourism industry - by encouraging wider adoption of digital services. The initiative has seen the implementation of networking projects, like that of Ooredoo, which claimed in January to have connected 77,000 homes with fiber broadband. The Sultanate’s first private telecommunications company, headquartered in Qatar, said at the time that it would provide 4G connectivity to 90 percent of Oman’s 4.6 million citizens by the end of April.

Cisco Unveils 400G Switching Done Right

Bandwidth and scale. These are two of the biggest challenges facing data center customers today. How can they support data-hungry apps like streaming video, or apps that use artificial intelligence and machine learning? And how can they keep growing their networks, without having to replace them every time? To meet the need for bandwidth and scale, Cisco is launching new 400 Gigabit Ethernet (400G) switches that will give customers an edge. The new 400G switches allow customers to create more powerful networks, more cost-effectively and in a fraction of the space. They provide four times the bandwidth and four times the scale of existing switches without using four times the power. And since the new switches are built on Cisco's leading Nexus portfolio, customers can choose to deploy 400G in the way that best meets their needs. They can be used on their own or in combination with Cisco's leading security, automation, visibility and analytics software. "Our 400G switches do more than just bring a new level of speed to customers. They support the delivery of the signature capabilities that customers expect for their modern data-driven workloads and cloud environments," said Roland Acra, SVP, General Manager Data Center Business Group. "Superfast policy, segmentation and whitelisting. Real-time visibility into packets, flows and events.

Smart buffering for big data and machine learning workloads. The ability to prioritize critical traffic on-demand. These are the things that Cisco has delivered to our customers across multiple generations of Nexus switches. And we are doing so again with our new 400G portfolio." Dell'Oro predicts the market for 400G will grow quickly, reaching \$1.5B in 2019 and more than doubling by 2020.** Cisco's new Nexus switches provide customers with the most comprehensive and customizable approach to 400G. They are: Built for the most demanding environments: The new 400G switches are designed to support the signature capabilities the Nexus switching portfolio is known for, delivered at wire speed. This includes support for advanced telemetry for deeper app visibility, real-time analysis and troubleshooting. And smart buffers specially tuned for scale-out app traffic. Customers can also integrate the switches with Cisco's leading Application Centric Infrastructure (ACI), Tetration, and Network Assurance Engine software. Doing

this allows them to increase app agility and improve data center security and automation, bringing 400G to Intent Based Networking. Built for customer choice and flexibility: Flexible deployment options let companies of all sizes support their specific needs and workloads. Customers can choose the options that best fit their needs, whether they are a webscale company, running a high-density or intent-based network, or using specialized apps. Built to last: Cisco is actively working with partners and third-party organizations to drive standardization and interoperability around 400G. Cisco collaborated in the recent 400G industry plug fests with interconnect and test solution partners and demonstrated cost effective 100G lambda optics modules for 400G. Cisco is beginning early field trails with customers in December 2018, giving IT organizations planning time to set up trials as soon as possible. The new Cisco Nexus switches will be generally available in the first half of calendar year 2019.



Cisco Brings Wired and Wireless Intent-Based Networking to the Masses

For over two decades, the Catalyst family of switches have been known for pushing the limits of what the network could do. Last year, Cisco's Catalyst 9000 switches pushed those limits even further by introducing the world to intent-based networking, helping big networks learn, adapt and evolve. Now, Cisco is expanding its iconic Catalyst portfolio to all access, including the branch, across wired and wireless. And it is bringing intent-based networking to deployments of all sizes, delivering a smarter, simpler and more secure network to more customers than ever before. "We're excited to bring the full power of Cisco's intent-based capabilities

to everyone, everywhere," said Sachin Gupta, senior vice president, Product Management, Enterprise Networking at Cisco. "We want to give IT the tools they need to automate and see the network end-to-end. Our expanded Catalyst 9000 portfolio lets customers do this not only for large wired networks, but for wireless and simple branch deployments too." Intent-based networking represents a fundamental shift in the way that networks are built and managed. One that does away with the old manual, time-intensive, error-prone way of doing things. Instead, these modern networks capture business intent and translate it into network policies. This

allows the network to be automatically configured in minutes, with the assurance that it has happened correctly. The Cisco Catalyst 9000 Series was built from the ground up for intent-based networking. It runs on a single, open, programmable OS that powers all access and WAN products. This allows Cisco customers to turn on new software innovations faster, simplify IT operations, and lower costs. A single software controller automates the entire network, while programmable ASICs provide unmatched investment protection. And security is embedded into the network, instead of bolted on.

Cisco, Wi-Fi Alliance among Those Applauding 6 GHz Auction

The FCC is proposing to make up to 1200 megahertz of spectrum available for use by unlicensed devices in the 6 GHz band. Advocates for more spectrum for Wi-Fi and other unlicensed uses got what they hoped for when the FCC unanimously agreed on a proposal to make up to 1200 megahertz of spectrum available for use by unlicensed devices in the 6 GHz band (5.925-7.125 GHz). The Wi-Fi Alliance, which had been advocating for the FCC to quickly release a Notice of Proposed Rulemaking to permit use of the 6 GHz band for unlicensed operations, applauded the FCC's action. "The FCC took an important step towards preserving broadband wireless connectivity for millions of Americans and creating new opportunities for the next generation of Wi-Fi," the alliance said in a statement. The Wireless industry is an ever-changing world where big ideas come along daily. Our subscribers rely on FierceWireless as their must-read source for the latest news, analysis and data on this increasingly competitive marketplace. The FCC said the proposed rules are designed to allow unlicensed devices to operate in the 6 GHz band without interfering with the operation of the licensed services that will continue to use the spectrum. In those portions of the 6 GHz band that are heavily used by point-to-point microwave links, the commission is proposing to allow unlicensed devices to operate where permitted by an automated frequency coordination system, and it's asking for comments as to whether that's necessary for devices operated only indoors. In the other portions of the

band where licensed mobile services such as the Broadcast Auxiliary Service and Cable Television Relay Service operate, the unlicensed devices would be restricted to indoor operations at lower power. Cisco also applauded the move. "We are excited to have FCC Chairman Ajit Pai and his fellow Commissioners Michael O'Rielly, Jessica Rosenworcel, and Brendan Carr, consider a new policy on 6 GHz spectrum that, when completed, will generate benefits for nearly every person and organization in the U.S.," said Mary Brown, senior director of technology and spectrum policy at Cisco, in a blog post. "And kudos to our elected officials in Congress on both sides of the aisle—in particular Senate Commerce Committee Chair John Thune (R-SD), Representative Brett Guthrie (R-KY) and Representative Doris Matsui (D-CA)—for supporting the FCC's upcoming evaluation of Wi-Fi for our future." Cisco has found that Wi-Fi networks in the U.S. carry about half of all internet traffic, more than fixed connections or wireless connections over a carrier's licensed spectrum. Its Visual Networking Index predicts that by 2021, 70% of the data generated on a smartphone will be "offloaded" to a Wi-Fi network. Meanwhile, the Spectrum Needs Study sponsored by Wi-Fi Alliance projects that up to a gigahertz of new spectrum is needed to connect the 20 billion Wi-Fi devices that are used every day, according to Chris Szymanski, director, Product Marketing & Government Affairs at Broadcom, who also expressed his satisfaction with the FCC's move. "Time remains of the essence and we hope the FCC proceeds to a Report

and Order quickly, featuring simple and flexible rules that will enable the industry to meet the American public's pent-up Wi-Fi demand as soon as possible," Szymanski added. Commissioners and FCC staff acknowledge there are a lot of incumbents in the 6 GHz band, but they're optimistic that a mechanism can work to accommodate both incumbents and new unlicensed use opportunities. AT&T previously has pointed out that the band contains about 100,000 microwave links, many of which are carrying critical voice and data traffic, including for the nation's first responders. AT&T was awarded the FirstNet contract last year to serve public safety with their own, dedicated LTE network. Expanding broadband services to more Americans is one of AT&T's highest priorities, and "we appreciate the Commission's efforts to promote broader and more efficient use of spectrum to reach this goal," said Joan Marsh, AT&T executive vice president of Regulatory & State External Affairs, in a statement. "We look forward to commenting on today's proposal to allow unlicensed use (PDF) of the 6 GHz band, while protecting existing users from harmful interference. And we are encouraged by the progress being made by industry to develop a sharing proposal with the unlicensed community that ultimately could allow coexistence of Wi-Fi-type devices and microwave links. But it is imperative that any unlicensed use must be responsible for avoiding interference with the existing, mission-critical uses of this band."

Cisco Pushes Kubernetes to Hybrid Cloud with Amazon Web Services

Cisco and Amazon Web Services have teamed up on a Kubernetes-based hybrid cloud solution that allows customers to bridge the gap between hardware and the cloud. While businesses and organizations are moving their data, applications and services to public and private clouds, not all of them are able to immediately move everything all at once. The announcement by Cisco and AWS allows customers to use Cisco's software and, if they choose, hardware with AWS' cloud-computing

power to manage workloads both on and off AWS' cloud. Both rely on Kubernetes, which was first built by Google before it was put in open source, and containers. The Cisco Hybrid Solution for Kubernetes on AWS makes it easier for customers to run production-grade Kubernetes on premises. This is done by configuring on-premises Kubernetes environments to be consistent with Amazon Elastic Container Service for Kubernetes (Amazon EKS) and by combining Cisco's networking,

security, management and monitoring software with AWS' services. "By adopting containers and Kubernetes, IT and Line of Business users can focus their efforts on developing applications, rather than infrastructure and 'plumbing,'" said Cisco's Reinhardt Quelle, principal engineer for the company's cloud products and services group, in a Thursday morning blog post. "Because Kubernetes is available everywhere, one can choose the best place to run an application based on business

Cisco Hybrid Solution for Kubernetes on AWS



needs. “For some applications, the scale and reach of the public cloud, along with its huge number of services available, will be the determining factor. For others, data locality, security or other concerns dictate an on-premises deployment.” Cisco has previously announced cloud partnerships with Google and Microsoft, but AWS is the leader in hybrid cloud. Kubernetes was a hot topic at Cisco Live this past summer, which

included the onstage presence of Google Cloud CEO Diane Green. Also of note, IBM’s intent to buy Red Hat for \$34 billion was largely based on Red Hat’s Kubernetes portfolio. To make the integration run more smoothly, Quelle said Cisco is the single point of contact for support across all the components of the solution—including AWS components—as opposed to having to seek support for each component

separately from different vendors. The Cisco Hybrid Solution for Kubernetes on AWS will be available next month. Cisco is offering the solution starting at \$65,000 a year. “Cisco Hybrid Solution for Kubernetes on AWS can be purchased as a hardware and software bundle consisting of all of the Cisco components or can be purchased a la carte via Cisco or a Cisco partner,” Quelle said. “Only (the) Cisco Container Platform is mandatory when purchasing the solution. All Cisco software components are orderable on one, three, and five year subscription licenses and all Cisco hardware components are sold on a perpetual basis. All AWS components are billed directly to the customer’s AWS account.” With infrastructure, applications and services moving to the cloud, Cisco and other hardware-centric companies have had to evolve their product lines toward software-based cloud offerings while battling newer entries into the market. VMware in particular has been active in the cloud and Kubernetes space as it offers more services for carriers and enterprises.



Eutelsat Procures Replacement Satellites for its Flagship HOTBIRD Neighborhood at 13° East

Eutelsat Communications has ordered two new satellites from Airbus Defense and Space to replace the three existing HOTBIRD satellites at its 13° East flagship neighborhood. These all-electric high-power satellites are set to enter into service in 2022, serving Europe, the Middle East and North Africa. The new satellites will reinforce and enhance the high quality of broadcasting services provided to Eutelsat customers on HOTBIRD, providing improved performances over Western Europe and Poland. Moreover, the satellites will offer advanced features in terms of uplink signal protection and resilience, as well as exceptional in-orbit redundancy. With a launch mass of 4.5 tones and an electric power of 22 kW, the all-electric propulsion satellites will be based on Airbus Defense and Space’s innovative Eurostar Neo platform which will be produced, along with their high-performance payloads, in their UK facilities in Stevenage and Portsmouth as well as in their French facility in Toulouse. This state-of-the-art technology enables Eutelsat to replace the current constellation of three satellites by two, further enhancing the capex optimization achieved through the application of the design-to-cost policy. This procurement is fully covered by the company’s existing capex budget. Rodolphe Belmer, Chief Executive Officer of Eutelsat, “We are delighted to have secured replacement capacity for our flagship HOTBIRD neighborhood at 13° East, which has played

a part in developing TV broadcasting formats since its creation and is a cornerstone of our video strategy. These new satellites have been specifically designed to enhance the service we offer to our customers at this key neighborhood, while representing the optimum solution in terms of capex efficiency. We are once again entrusting this project to our long-standing partner Airbus Defense and Space who have already delivered 23 satellites for our group.”



Eutelsat Communications First Quarter 2018-19 Results

Eutelsat Communications reports revenues for the First Quarter ended September 30, 2018. Rodolphe Belmer, Chief Executive Officer, commented: "The underlying performance of the five operating verticals is globally in line with our expectations at this stage of the year, where the revenue profile is back-end loaded due to the ramp of African Broadband and the China Unicom contract in the Second Half. Core Broadcast revenues were stable, while Mobile Connectivity saw further double-digit growth. Recent months have seen the successful refinancing of our January 2019 bond, securing significant future savings in financial costs, and the disposal of our non-core interest in Eutelsat 25B. On the commercial front, we are rolling out the Konnect Africa broadband service in several countries. In video, the launch of the hybrid satellite-OTT turnkey delivery solution, Eutelsat CIRRUS, is an important step in the integration of satellite into the IP ecosystem, generating long-term additional revenue opportunities. Elsewhere, we are participating with the other major satellite operators in the C-Band Alliance consortium, designed to facilitate the clearing of U.S. mid-band spectrum for 5G. The unexpectedly low outturn of the Fall Renewal campaign in Government Services, due predominantly to a one-off contract loss, while not representative of the underlying trend in this vertical, is a meaningful headwind for revenue development in the current year. In consequence, we are adjusting our Full Year revenue objective for the operating verticals to 'broadly stable' versus 'slight growth' previously, with growth to resume in the Second Half. This slight topline revision has no impact on the fundamentals of our business and our ability to attain our other financial objectives, notably EBITDA margin and discretionary free cashflow, which are all confirmed. We

remain focused on successfully delivering on our commitments on cashflow maximization, deleveraging and shareholder remuneration, while preparing for the return to growth driven by connectivity." Since the start of FY 2018-19, Eutelsat has taken further measures to maximize cash generation, continuing the strong progress of the past couple of years: The successful issue of an €800 million 2.0 percent Eurobond with a 7-year maturity enabling the full redemption of the outstanding bonds bearing a 5.0 per cent coupon maturing in January 2019. This transaction will further reduce pre-tax cash interest by some €24 million on an annualized basis from FY 2019-20, while also extending the debt maturity profile. The disposal of its interest in a non-core asset, EUTELSAT 25B, to its co-owner, Es'hailSat, for a cash consideration of €135 million. Further progress on the implementation of our capex optimization strategy with: The replacement of the HOTBIRD constellation negotiated at highly compelling terms; And the signature of a long-term service agreement with Arianespace covering five launches until 2027, providing cost-effective, assured access to space with schedule flexibility. At the same time it laid further foundations for its return to growth with: The launch of Eutelsat CIRRUS, a hybrid satellite-OTT turnkey delivery solution which will enable broadcasters to offer a flexible, seamless content experience across multiple screens, and representing a further step in the integration of satellite into the IP ecosystems. Eutelsat CIRRUS will allow enhancing end-viewer experience and generating additional revenue opportunities. The entry into service of the capacity leased on the Al-Yah 3 satellite enabling the progressive commercial launch of the Konnect Africa broadband service in several countries. Elsewhere, Eutelsat participated, together with other major satellite operators, in the creation of the C-Band Alliance, a consortium designed to facilitate the clearing of U.S. mid-band spectrum for 5G, while protecting content distribution and data networks. The outcome of the Fall renewal round with the US Department of Defence was unexpectedly low, at 70%. It stems mainly the loss of a single large contract with a specific distributor, and is not reflective of the underlying trend in this vertical. However it represents a meaningful headwind to our overall revenue profile for the current year, and in consequence we are adjusting our objective from 'slight growth' to 'broadly stable'. All other elements of the outlook, including EBITDA margin and discretionary free-cash-flow, for the current and subsequent years are confirmed.



Comprehensive Study of Satellite Television Reception Places Eutelsat as Market Leader across Nigeria, Cameroon and Ivory Coast

A far-reaching in-depth study, led by Nielsen, of television reception throughout Nigeria, Cameroon and Ivory Coast, has positioned Eutelsat as satellite market leader within these countries. The face-to-face interviews were conducted with 3,000 households in Nigeria, 2,000 in Cameroon

and 2,000 in Ivory Coast, representative of the population of the geographical area surveyed. Satellite television reception is the dominant technology in Ivory Coast reaching 68% of TV households (1.5 million households) and is also a major technology in Nigeria reaching 41% (10.3

million households) and in Cameroon with 38% households (1.3 million households). "Eutelsat is pleased to have established a strong presence in the regional audiovisual landscape, providing millions of households with access to a wide range of local and international channels. This

study confirms that Eutelsat's 16° East position is the leading position for free-to-air broadcasting in Cameroon and Ivory Coast and that Eutelsat's three positions, 36° East, 7° East and 16° East, serve the largest combined audience in the Nigerian market. It is a testament to our long-standing partnership with many of Africa's leading TV channels and bouquets. We look forward to strengthening these partnerships to develop our services as these dynamic markets continue to evolve," said Nicolas Baravalle, Vice President for Sub-Saharan Africa at Eutelsat. Eutelsat's 16°East neighborhood in pole position across Cameroon and Ivory Coast. The study also revealed that Eutelsat's 16° East neighborhood is the leading FTA position in Cameroon and Ivory Coast with a combined reach of 1.2M households in those 2 countries. In Cameroon, 16° East is the leading position and reaches a total of 940,000 households representing 73% of the DTH installed base. In Ivory Coast, it has the largest FTA installed base, reaching

240,000 households (37% of the DTH installed base). 16°East position caters for a wide variety of tastes with over 160 channels, among which are highly sought after local channels such as CRTV, Canal 2 International, Trace Africa, Novelas TV, RT1 and RT2 as well as popular international channels in French and English. Eutelsat has the highest combined reach across the Nigerian market between its 3 positions, 36° East, 7° East and 16° East. Over 5M households in Nigeria (one out of two DTH households) point towards a Eutelsat position. Eutelsat's 36° East neighborhood is Nigeria's leading Pay-TV position, reaching 1.3M households. It hosts DSTV, the leading satellite Pay-TV platform in the region and groups together around 400 channels including 43 channels in HD accessible throughout region and includes top most watched channels in Nigeria such as AIT International, CNN International, Silverbird TV and Zee World. Eutelsat's 16° East neighborhood is a leading free-to-air position reaching a total of 2.2M

households and offers a diverse line-up of popular Nigerian channels such as CRTV, Channel TV and Silverbird TV, local content specifically popular to the Hausa community; My TV Hausa and Alwilayah TV Hausa, as well as international channels such as Aljazeera, France 24. Eutelsat's 7°East neighborhood has a reach of 1.4M households in Nigeria, mainly catering to English-speaking locals, with Channel TV, TVC News Nigeria and international content such as CNN, Fox, BBC World news, Bloomberg TV Africa, CNBC Africa and Al Jazeera. According to study findings, the need for HD is rising in Sub-Saharan Africa with a growing demand for HD content specifically in Pay-TV. This is coupled with a rise in the affordability of equipment such as televisions and set-top-boxes. The number of HDTV equipped households is already sizeable: in Nigeria 9.5 million (38%) households were identified to be HDTV compatible homes, 0.9 million (18%) in Cameroon and 0.5 million (22%) in Ivory Coast.



Facebook Appoints Managing Director in MENA

Facebook has announced the appointment of Ramez T Shehadi as its new Managing Director in the MENA region. In his new position, Shehadi will lead the commercial growth and impact of Facebook and its expanding portfolio of apps, services and businesses across the region. "The ever-evolving Mena region continues to be a key market for Facebook, with over 181 million people using the platform every month," said Ari Kesisoglu, vice president of Middle East, Turkey and Africa at Facebook. "Driven by a mobile-first strategy, Facebook's family of apps and services help people to explore new ways of digital storytelling and support brands to reach the right audiences. Ramez's depth of global experience in industry and technology strategy will help us further drive impact amongst individuals, communities and institutions in the region; while maintaining a focus on our mission to bring people together and build community. "We remain only one per cent finished in our journey and look forward to seeing Ramez lead our Mena team into the next chapter of Facebook's story in the region and beyond," Kesisoglu added. Shehadi brings extensive expertise in establishing, scaling and running regional and global lines of business and cross-industry portfolios for top-tier global consulting firms, most notably as senior partner and managing director of the Mena portfolio of Booz Allen Hamilton, lead partner of the Mena Digital Business and Technology practice of Booz & Company and Global co-lead of Booz Digital, among others.



Shehadi said, "Digital transformation is well underway across the region, driven by demand for secure, fast and personalized online experiences throughout social communities and public and private sectors. I am excited to join the Facebook team at such a time and look forward to helping shape and drive the strategy in Mena, ensuring that the market remains prioritized and a source of information globally." Shehadi continues his efforts in social responsibility, actively supporting entrepreneurship and digital startups across the region as well as NGOs empowering communities in need. He serves on boards of leading global public, private and non-profit institutions and is a fellow moderator of the Aspen Institute's Middle East Leadership Initiative.

Facebook Hosts First 'Boost Your Business' Event in Cairo

Facebook hosted its first 'Boost Your Business' event in Cairo, welcoming 400 small and medium business (SMB) owners to learn from businesses that have used Facebook to grow, establish connections, meet with Facebook experts, and participate in training events. On behalf of Minister of Communications and Information Technology, Amr Talaat, Hossam Othman, Advisor to the Minister for Innovation and Entrepreneurship delivered the keynote speech highlighting the role of start-ups and SMBs in driving growth. Nashwa Aly, Facebook's head of Public Policy for MENA, covered Facebook's role in helping SMBs. "We are fully aware that SMBs are a vital element in the growth of any economy or market, and we consider them our essential partners in our efforts to shift towards a digital economy, and build a knowledge-based society," Talaat said. "We want to play a bigger role in taking that success to even higher levels. We believe that SMBs have transformational potential and we are here to help them unlock that potential." Aly explained. Today tens of millions of businesses around the world have harnessed the power of Facebook and Instagram to get started, connect with customers to grow, trade, and hire. In Egypt 23 million people actively use Facebook daily,



while 37 million actively use Facebook each month via mobile. The majority of these – 71% – are connected to at least one local SMB. Aly said that SMB owners provide products and services that impact everyone's life, all over the world, and local businesses create over 60% of new jobs.



Google Pay Now Available in the UAE

Google announced the launch of Google Pay in the UAE, allowing people to pay simply and securely with their Android phones. It simplifies shopping by helping you pay safely in apps and on websites, in stores that support contactless payment, and across all Google properties including Google Play. With the new payment app, Android users (Android 5+ phones) can complete payment processes in a few

seconds whether online or offline. To be ready to use this payment method in stores, users simply add their supported Mastercard or Visa cards issued by any of the partner banks (Emirates Islamic, Emirates NBD, Mashreq and Standard Chartered [RAKBANK coming soon]) to their Google Pay app. Then users only need to wake the phone screen up and tap it to the contactless terminal via Near Field

Communication (NFC). For transactions above AED 300, as an additional safety measure, users also have to enter their card pincode into the payment terminal. Google Pay is also integrated into various Google products (for example Google Play and Chrome), making it easier to buy movies, books, and apps, and to list all purchases in one place. Security is a key element in the design of Google Pay. The credit card number is neither stored on the mobile device nor in the system of the seller. When users pay in stores, their transactions are made using a virtual card number called a token, which is device-specific. The token is associated with a dynamic security code that changes with each transaction. If a phone is ever lost or stolen, users can simply use the "Find my device" function to instantly lock their device from anywhere, secure it with a new password, or even wipe it clean of their personal information. There is no need to deactivate the card itself, as its data aren't stored on the device. Google Pay is now available on all Android devices, running on Lollipop 5.0 or higher.





Huawei Kicks Off Commercial 5G Era, Shipping 10,000+ 5G Base Stations

The 9th Global Mobile Broadband Forum – “5G Inspiring the Future” – kicked off in London, gathering more than 2,200 leaders and analysts from mobile telecom operators, vertical industries, and standards organizations around the world. At the event, Huawei’s Rotating Chairman, Ken Hu, announced the shipment of Huawei’s first 10,000 5G base stations, outlining the company’s vision for the future of 5G. “5G will start a technology revolution,” he said. “It will bring new power to all ICT technologies, and trigger sweeping changes in business. There will be new opportunities the likes of which we’ve never seen.” He encouraged industry partners to adopt a fresh mindset as they define new devices, develop new applications, and make new breakthroughs in experience. This, he said, is key to maximizing the value of 5G. He went on to outline the five fundamental changes that 5G will bring: 5G will turn connectivity into a platform. With 5G, wireless access networks will go beyond pipe, providing seamless, ubiquitous, and limitless connectivity for all people and all things. Everything will go online. Right now, most things are offline by default, and most electronic devices are not connected. With 5G, being online and connected will become the default for everything. The world will go all cloud. Supercharged with 5G, the cloud will provide massive computing power with instant transfer speeds and near-zero lag. This will make intelligence on demand available for everyone, everywhere. New business models like Cloud X – where devices are boosted by inexhaustible cloud-based resources – will begin to emerge. Devices will be redefined. With AI support across devices, network, and the cloud, devices will go from plug and play to plug and think. They will understand users better – able to actively predict our needs, not just passively respond to commands – and interact with us in more natural ways. Experience will flow seamlessly. With existing networks, our online experience is fragmented from one scenario to another. When all things are online and cloud-based, experience and content will flow seamlessly through time, space, and devices for a truly holistic

experience across all scenarios. “From all angles, 5G is ready,” Hu said. “It’s ready to use, it’s affordable, and most importantly, demand is real. Of course, there are still some barriers to 5G deployment.” Ken Hu went on to discuss challenges with spectrum allocation and site deployment. Specifically, mobile operators lack spectrum resources. To help speed up deployment, Hu recommended that governments accelerate the process of harmonizing and releasing continuous bands of large-bandwidth 5G spectrum, and at a total cost lower than 4G. “In the meantime,” he pointed out to mobile operators in the audience, “in addition to C-band, all bands can and will eventually be used for 5G, including 2.3 GHz and 2.6 GHz bands.” “As for sites, deploying networks is expensive business,” he continued. “We encourage governments to make more public resources available for site deployment. Shared utility infrastructure, such as rooftops and light poles, can help carriers cut costs and time, and can even open up new revenue streams for public utilities.” He summed up his keynote by highlighting Huawei’s four main innovation targets for 5G. “We believe 5G will make an important and lasting contribution to society. At Huawei, we are working hard to make 5G networks stronger, simpler, more intelligent, and more secure.” GSMA, a trade body that represents the interests of mobile network operators, will host a Cloud AR/VR

Summit on the second day of the Mobile Broadband Forum. During the summit, GSMA will launch a Cloud AR/VR Forum to help operators and ecosystem partners incubate new services and applications in the 5G era. In addition to keynotes and breakout sessions, the forum features a 2,700-square-meter indoor convention hall where Huawei will showcase breakthrough network technologies like SingleRAN Pro, and next-generation applications that use the Cloud X model. Organizations like GSMA, TechUK, and the Government of the Netherlands will also have exhibits, alongside 10 different mobile operators from Europe, the Middle East, and Asia-Pacific, and 36 Huawei partners from around the globe. Outside the convention hall, there is an outdoor setup featuring the largest 5G trial network in Europe, giving attendees the opportunity to experience a live, continuous 5G experience in a moving vehicle. In the trial zone, all four of the UK’s major operators – BT/EE, Three UK, Vodafone, and O2 – are working side-by-side to showcase 5G solutions for WTTx (wireless for home broadband), the Internet of Things, and connected vehicles. The Global Mobile Broadband Forum has been held every year since 2010. The purpose of the forum is to encourage more in-depth discussion and collaboration between global telecom operators, vertical industries, and other stakeholders across the value chain.



Help Operators Deploy 5G Networks, Huawei Urges European Governments

Governments should subsidize telecoms infrastructure deployments and work harder to make spectrum available, the CEO of Huawei has said as the vendor revealed it had shipped its 10,000th 5G base station. Speaking at the vendor's Global Mobile Broadband Forum in London, Ken Hu backed recent calls from operators for help with getting Europe ready for 5G. Hu said governments need to work harder at harmonizing and release contiguous bands of 5G ready spectrum and charge less than they did for LTE. He added: "In the meantime, in addition to C-band, all bands can and will eventually be used for

5G, including 2.3 GHz and 2.6 GHz bands." Ironically for a vendor selling infrastructure and services, Hu sympathized with the costs operators face in deploying new networks. He said: "As for sites, deploying networks is expensive business. We encourage governments to make more public resources available for site deployment. "Shared utility infrastructure, such as rooftops and light poles, can help carriers cut costs and time, and can even open up new revenue streams for public utilities."

In September, European operator CEOs urged the European Union to help them

with the costs and difficulties involved in deploying 5G. In spite of the costs involved, Huawei has used the event to announce it has crossed the 10,000 mark for 5G base station shipments. Elsewhere, Hu was keen to talk up 5G's potential, describing it as ushering in a "technology revolution". He added: "From all angles, 5G is ready. It's ready to use, it's affordable, and most importantly, demand is real." The CEO reiterated the now commonly cited benefits of 5G, from limitless connectivity and connected devices by default, to worldwide cloudification and fully reinvented devices.

Huawei Launches New Generation CloudLink Collaborative Telepresence Products

At the product launch event "Connecting Time & Space, Changing the Future" held during Huawei Eco-Connect Europe 2018, Huawei launched a new series of CloudLink collaborative telepresence products, including the CloudLink Board, CloudLink Box, and CloudLink Bar, leading enterprise communication and collaboration into the intelligent era. In the digital era, innovation drives the development of enterprises, with smooth communication and collaboration being a key factor behind business success. Mr. Dong Wu, Vice President of the Cloud Communications Marketing & Solution Sales Dept. of Huawei Enterprise BG, said: "Huawei has developed new-generation CloudLink enterprise communication solutions. These new solutions will help enterprises implement digital office space, intelligent working methods, and industrial production. Huawei is looking forward to working with our partners to activate transformation in enterprise collaboration and communication, serving various industries and shaping the future." Digital office space: providing a series of digital communication and collaboration tools for enterprises to build online office space for different needs, and meet office requirements in all scenarios. Intelligent working methods: providing innovative services for enterprises, such as intelligent conference, intelligent contact center, and intelligent office assistant, to create a more efficient and focused work experience for employees. Industrial production: working with partners to build more than 40 industry solutions based on "Platform + Ecosystem", such as healthcare, education, government, transportation, and finance. Continuous digital evolution has moved conferences from the sphere of traditional video to interactive telepresence. For the collaboration 3.0 era, Huawei has launched a new-generation of CloudLink collaborative telepresence products, which feature collaboration, artificial intelligence (AI), and ultra-HD, making communication more efficient and satisfying the needs of various industries. CloudLink Board: new-generation all-in-one intelligent videoconferencing endpoint that integrates the videoconferencing,



interactive collaboration, and remote sharing functions, to provide an intelligent conference experience, with voice control, intelligent tracking, and facial recognition. CloudLink Box: new-generation split-type ultra-HD videoconferencing endpoint with dual 4K/P30 super audio and video processing capabilities and a variety of audio and video ports. CloudLink Box can work with the CloudLink Touch device to implement intuitive and convenient conference management. CloudLink Bar: integrated intelligent navigation videoconferencing endpoint. It can track speakers in real time through sound localization and face detection, and is able to focus on and take close-up images of speakers. With the launch of CloudLink, Huawei has built a one-stop solution for enterprise communication and collaboration in all scenarios. Through smart connectivity, device-cloud synergy, and openness and convergence, Huawei Enterprise Communications will bring new digital transformation tools to global enterprises and organizations, making further progress to achieve Huawei's vision of bringing digital to every person, home and organization for a fully connected, intelligent world.

Huawei Strengthens OpenLab Program to Foster Industry Ecosystem in Europe

Huawei unveiled that it will build a new OpenLab focusing on Industry 4.0 and Smart Manufacturing in Ismaning/Munich by the end of 2018, after successfully launching the Munich and Paris OpenLabs in 2016 and 2017 respectively.

Strengthening OpenLab Program with USD 50M Total Investment in 3 Years in Europe

Huawei has built and operates 11 OpenLabs globally today; there will be 3 OpenLabs in Western Europe by the end of 2021 and a total investment of around USD 50 million is planned there to strengthen joint innovation and solution building with customers and partners. Wu Mo, Director of Western European OpenLab, said: "In the next three to five years, Huawei's AI technology will be widely used for device-cloud collaborative image/video analysis, such as the autonomous driving in the vehicle-road collaboration scenario, Huawei's IoT technologies enable digitalization of massive terminals and can easily build digital cities based on all measurable points in the city. The mission of the Western Europe OpenLabs is to build a digital enablement platform for smart cities, manufacturing, and retail industries, and open up Huawei's powerful ICT capabilities to facilitate partners to develop rich and diverse intelligent applications in various industries, to building a Fully Connected, Intelligent World."

Platform + Ecosystem Strategy Accelerates Digital Transformation with Customers and Partners

The Global OpenLab Program is aligned with Huawei Enterprise Business Group's "Platform + Ecosystem" strategy. This strategy centers on collaborating with partners and customers to develop innovative, differentiated and leading industry-specific solutions that enable open, elastic, flexible, and secure platforms to drive enterprise digital transformation. Huawei is focused on facilitating a digital transformation ecosystem to implement joint innovations and expand the ecosystem in terms of industry alliances, business alliances, developer platforms,

and open-source communities. "In 2018, Huawei prepared around USD 2 million funding for industry solution development and encouraged solution partners to develop industry applications based on the black-land (Huawei digital enablement platform). Currently, in two OpenLabs in Western Europe, Huawei has developed joint solutions and go-to-market with more than 40 partners globally. Many local industry customers are implementing these joint solutions from Huawei OpenLab, such as the smart manufacturing solutions with partners like SAP, to help manufacturing customers transform towards Industry 4.0, and build a smart city's nervous system and city brain through collaboration with Accenture and other partners. It also cooperates with startups such as Malong and Hanshow to build innovative consumer-centric and data-driven new retail solutions, helping retail customers improve customer experience, increase revenue, improve operation efficiency, and reduce costs. Huawei also works with Altair to build a collaborative R&D simulation cloud solution to help automotive industry customers achieve digital transformation in the R&D phase, with Wipro to build a smart supply chain solution to help logistics customers realize the intelligent logistics services", added Wu Mo. Commenting on its collaboration with Huawei, Director of

SAP EMEA South Region Marco Ciavarella added: "Starting from 2012, SAP has established strategic alliance partnership with Huawei, Huawei is one of SAP's global technology partners. Our strategic relationship has been successful and fruitful for both organizations and, most importantly, for our joint customers. The SAP and Huawei partnership has brought many innovative solutions with new hardware choices offering higher reliability and better price/performance, now we are expanding our collaboration further on manufacturing, smart city industries by leveraging competence and capability of Huawei OpenLab and SAP Co-innovation lab to drive more joint industry solutions for business success together." Huawei is committed to cooperate with its customers and partners in building ICT platforms featuring Cloud, Pipe, and Device collaboration, and orchestrating symbiotic, vibrant, and sustainable ecosystems. Huawei will continue to work with its partners to explore new ways to address digital transformation challenges in the new ICT era. Huawei eco-Connect | Europe is the annual flagship event of Huawei in the European region. Its intention is to establish and promote an open, innovative and collaborative ICT ecosystem in the cloud era.



Huawei Technology Organizes Cloud Summit in Pakistan

A large number of government officials, industry specialists, telecom operators, media journalists, opinion leaders and educationists, across a range of disciplines will attend Huawei Cloud Summit happening from November 5, 2018 to November 8, 2018. Hosted by leading global information and communications (ICT) solutions provider, Huawei Technologies, the cloud summit aims at highlighting the latest innovations, business practices, and solutions in domains like cloud services and digital transformation. Huawei will take this opportunity to discuss its strategy in these domains. Mr. William Jin, Vice President of Huawei IT Product line gave a welcome speech. He attributed

Huawei's rapid development to the annually 10% of its total revenue spending on R&D. He also mentioned new Ascend 910, the world's first single AI chip was launched in Huawei Connect in Oct. 2018. Finally Mr. Jin promised that Huawei will work with partner to build a bright future in Pakistan. The opening ceremony was also attended by Mr. Mudassar Hussain, Member Telecom of Ministry of Information Technology and Telecommunication. In his speech he appreciated the great efforts put in by Huawei to make this event successful. "ICT infrastructure is an important pillar of national economic growth, and cloud in particular is key to unleashing the power of connectivity. Countries and

industries should turn their attention to digital transformation as a driver for growth and pursue greater development and investment opportunities in emerging fields like cloud computing" he added. Mr. Naveed Tahir of Higher Education Commission at the summit presented the idea of smart universities. "Huawei's long-term collaboration with HEC has been very beneficial for both parties. Together we have been able to establish a name in ICT industry by modelling HAINA academies. This is a period of cloud computing and journey to digital readiness." He added. Huawei has heavily invested in R&D and has 15 R&D centers around the globe.

Huawei to Launch Public Cloud in South Africa

Huawei has concluded plans to build its Public Cloud in Johannesburg, South Africa to provide cloud services to all sub-Saharan African countries. A statement from the firm on Tuesday said the initiative was part of the company's goal to accelerate its cloud business across the world. It added that the ICT giant will hold a launching ceremony on November 14 in Cape Town for its first African station expected to be based in Johannesburg. "The company believes cloud services are essential for digitization of economies and has expressed commitment to providing open, flexible, easy-to-use and secure cloud services, laying a solid foundation for a fully connected, intelligent world by bringing digital to every person, home and organization," the statement noted. Commenting on its globalization strategy, Deng Tao, Vice President of Huawei Cloud BU said, "Huawei Cloud was globalized since its inception because Huawei had been providing its products and technologies in the form of cloud services to partners like Deutsche Telekom (Germany), Orange (France), Telefonica (Spain) and China Telecom. "Based on Huawei's 30 years of ICT infrastructure experience and nearly 10 years of continuous R&D in cloud computing technologies, Huawei Cloud can provide a one-stop solution to large enterprises; addressing their challenges in digital and cloud transformation, as well as to small and medium-sized companies

that aim to expand their business." Since it was established in March 2017, the Huawei Cloud Business Unit (BU) has unveiled more than 120 cloud services in 18 major categories. These cover more than 60 general solutions including SAP, high-performance computing (HPC), Internet of Things (IoT), Security, DevOps and more than 80 industry scenario solutions; covering manufacturing, e-commerce, gaming, finance and Internet of Vehicles (IoV), according to the statement. In 2018, Huawei Cloud officially launched the Hong Kong, Russia and Thailand Stations. By end of September 2018, Huawei Cloud had provided services in Asia Pacific and partner public cloud services in Europe and Latin America, outside of the Chinese market. Huawei Cloud and Huawei partner public cloud are available in 14 countries and regions, and will be available in most of major the regions around the world by end of 2018, the firm said. This November, Huawei launched its comprehensive Artificial Intelligence (AI) strategy and full-stack, all-scenario AI portfolio which is designed to provide powerful support for Huawei Cloud EI (Enterprise Intelligence). It will be recalled that an AI service platform for enterprises and governments, was released in September 2017. To turn AI into a practical reality, Huawei comes up with the concept of EI, saying "a cloud will prosper only when it helps customers create value on an ongoing basis." Also

commenting on how to combine industry insight with AI, Jia Yongli; General Manager of EI Product Department of Huawei Cloud BU said, "Huawei Cloud EI is a scenarios-based service. Huawei Cloud EI drives industry modernization in three scenarios, including repetitive and high-volume work, tasks that require expert experience and work that needs multi-domain collaboration. "These will help improve efficiency, pass on expertise, and break the limits of human intelligence." It will be recalled that on April 17, 2018, Cloud Native Computing Foundation (CNCF), the world's top open source community in cloud technology, officially announced Huawei election to the Technical Oversight Committee (TOC), making Huawei the first Asian company to be admitted into the CNCF TOC. Similarly in May 2018, Huawei Cloud became an SAP-certified platform for deploying SAP HANA and SAP NetWeaver. "The needs of enterprises in business development have become more complex and diverse, as they need not only to develop new applications on public clouds but also migrate some of their traditional services to public clouds, while continuing to provide support for these services. "Huawei Cloud is committed to working with partners to build sustainable partnerships that can lead to an open ecosystem to better meet customers' needs," the statement read.

Huawei CloudFabric Supports Container Network Deployment Automation, Improving Enterprise Service Agility

At HUAWEI CONNECT 2018, Huawei announced that its CloudFabric Cloud Data Center Solution supports container network deployment automation and will be available for the industry-leading enterprise Kubernetes platform via a new plug-in. This solution will be designed to enable customers to obtain a unified network architecture for containers, virtual machines (VMs), and bare metal servers (BMSs), improving service agility. Huawei is collaborating with Red Hat to enable interconnection between Huawei CloudFabric and Red Hat OpenShift Container Platform with a goal of building a next-generation container network collaboration solution. Container and VM technologies for computing virtualization coexist in data centers. With the maturity of VMs, container clusters are becoming mainstream service platforms due to their low resource usage, fast startup, and easy migration. After an enterprise begins to deploy containers in production systems, traditional manual configuration and deployment methods can become inefficient at handling basic requirements such as fast container provisioning, unified management, and security isolation. Enterprises need more-agile methods. Via a new plug-in that Red Hat and Huawei are designing, Huawei CloudFabric will be available for industry-leading container solutions such as Red Hat OpenShift Container Platform, an enterprise Kubernetes platform that is a more secure, consistent foundation to deliver applications, with full-stack automated operations and streamlined developer workflows to get to market faster. The Huawei solution can automatically identify containerized micro-service requirements that are defined in the container platform, convert the requirements into network policies, and deliver policies automatically. Huawei CloudFabric can support login and logout of 10k containers per minute, implementing elastic and on-demand resource scaling. Users can check resource availability in advance and perform closed-loop verification after configuration to enable smooth service operations. In addition, Huawei CloudFabric's standard open architecture will be optimized for mainstream container platforms such as Kubernetes and Red Hat OpenShift Container Platform to provide a ready solution for commercial use. Huawei has been devoted to the container open source community for many years, where Red Hat is also a leader. Both Red Hat (#3) and Huawei (#4) are among the top contributors to the open source Kubernetes project; Huawei is the top provider of Kubernetes container

technology among Chinese vendors and the sole Chinese representative of the Kubernetes Technical Oversight Committee. Mr. Mark Wohlfarth, Global Head of Network Ecosystem for Red Hat said, "Red Hat OpenShift Container Platform is one of the most widely used and most comprehensive enterprise-class Kubernetes platforms in the industry. I believe that the cooperation with Huawei CloudFabric Cloud Data Center Solution helps meet customers' requirements for container-based applications." Mr. Yu Tao, Director of Huawei Data Center Network Solution, said, "The data center is the core of the enterprise digital platform. In the data center network field, Huawei adheres to open innovation. Huawei CloudFabric supports container network deployment automation, helping customers easily manage all workloads through a single control interface and achieve service agility and innovation. Through cooperation with Red Hat, we hope that more enterprises can obtain complete and mature commercial solutions." The Huawei CloudFabric Cloud Data Center Network Solution has been successfully commercialized in more than 6,400 enterprises worldwide. The solution has helped customers in finance, Internet, carrier, and other sectors implement innovative



business services based on "digital twin" technology, enabling data centers to become business value creation centers.

Huawei, Turkcell Sign Deal on Smart Cities in Turkey

Turkey's leading mobile phone operator Turkcell and Chinese technology giant Huawei have signed an agreement to collaborate on smart cities. The deal aims to set up collaboration on improving infrastructure for smart cities in Turkey, Turkcell said in a statement. Turkcell Board Chairman Ahmet Akça said cooperation with Huawei is "a great step" for Turkey

to have new generation communication technologies and to play a pioneering role in 5G. "This cooperation will enable our cities to become smarter through being equipped with 5G technologies," Akça said. Li Dafeng, Director of the Huawei ICT Infrastructure Managing Board Office, said the agreement will pave the way for digital transformation in Turkey and Central Asia.

The concept of "smart cities" seeks to integrate sustainable solutions offered by new-generation technologies into all urban management processes to solve the major problems facing metropolises. Earlier in September, the two companies had signed a Smart City cooperation protocol with Turkey's Samsun province. With this project, the parties are looking to enable

the people of Samsun to experience the most up-to-date smart city technologies before anyone else and to make digital transformations at different points in the city, where traffic is one of the biggest problems. As part of the protocol, Turkcell and Huawei will develop cooperation and smart technology solutions for Samsun, like smart transportation, agriculture, meters and parking. Reports suggested that Turkcell will provide cloud computing services through data centers with fixed broadband (FBB), mobile broadband (MBB) and NB-IOT connectivity services required to implement the project. Huawei, on the other hand, will provide vertical solutions including smart transportation, smart water and smart parking solutions, as well as IP and IT products.



Huawei and TPCAST Collaborate to Enhance VR Capabilities Over 5G Broadband

Huawei, a leading global provider of information and communications technology (ICT) infrastructure and smart devices, and TPCAST, who introduced the world's first commercial wireless virtual reality (VR) solution, will cooperate on exploring a cloud-based VR project in the Middle East. The two companies signed a memorandum of understanding (MoU) at Huawei's 5G Ecosystem Conference during Huawei Innovation day on 15 October 2018, at the region's largest technology exhibition, GITEX, in Dubai. The collaboration will be enabled by the emerging 5G broadband digital ecosystem. Huawei is a pioneer in the emerging technology that will provide users with multiple gigabit speeds within homes, offices and public spaces. Faster Internet speeds will enhance gaming and video streaming capabilities. Consumers will have easier access to smart technologies driven by the Internet of Things. Networks will have a far lower latency, allowing for deeper smartphone penetration. As part of the collaboration, Huawei will provide its Cloud video and VR platform which allows video content to be accessed, managed, and operated efficiently, along with high

specification Set-Top-Boxes (STB). TPCAST will provide ultra-low latency codec, a VR back-end control protocol, as well as multi-user wireless VR central management. Both parties will share their global and local ecosystem partner resources to open market exploration in Middle East. Globally, Huawei was first to unveil a full range of end-to-end 3GPP-compliant 5G product solutions, covering the core network, bearer network, base station and terminals, and the world's first 5G chipset. The company's research and development into 5G technology falls within its corporate social responsibility ethos to bring digital to every person, home, and organization for a fully connected and intelligent world. "Within the 5G platform, the Huawei-TPCAST collaboration will also broaden the opportunities within both VR and augmented reality (AR)," said Reiner Pes, General Manager - EMEA, TPCAST. "Our codec technologies will be a key factor for both accelerating the development and launching these opportunities to the market." Mr. Wang Su, Vice President of Marketing Huawei Middle East added, "This collaboration with TPCAST will help us to support the introduction of 5G-based

cloud VR use case to the market. Huawei, through establishing the Middle East 5G ecosystem program, provides the cloud-based use case development platform, and supports the integration and verification of 5G use cases. Huawei's E2E 5G low latency solution and TPCAST's codec technology will together offer an enhanced experience of VR services. This partnership will promote organizations in the region to seize these new opportunities for growth." Within the theme, '5G is Now, Sailing to New eMBB Horizons', this year's 5G Ecosystem Conference will focus on how 5G will reshape the Middle East's digital ecosystem. As a leading telecommunication supplier, Huawei starts the 5G research from 2009 and contributes the most key technologies for global unified 5G protocol. Huawei is also the first of the industry to provide end-to-end 5G solutions with competitive roadmap to accompany our partners to build 5G leadership. We are honored to be with our partners together to deploy 5G Giga bps everywhere trial network in Middle East by Huawei 5G SingleRAN Pro solutions.

Huawei and Dragon INFO Partner to Deliver AI-driven Video Cloud Policing Big Data Solution

Huawei, a leading global provider of information and communications technology (ICT) infrastructure and smart devices, signed a memorandum of understanding (MoU) with Dragon INFO to develop a Video Cloud Policing Big Data Solution. The two companies signed the MoU at the region's largest technology exhibition, GITEX, in Dubai. An integrated artificial intelligence (AI) analysis tool for public security customers, the Video Cloud Policing Big Data Solution will enable intelligent crime investigation and prevention. It can analyze huge volumes of data to obtain valuable information on first time visitors, frequent access statistics, movement patterns and suspicious activity. It provides a holographic profile of key personnel, background information and activity track dynamics. On a wider scale, it supports cross-regional and global information sharing. "This year's AI theme at GITEX provides the ideal platform to launch this new collaboration," said Mo Chen, Chief Executive Officer, Dragon INFO. "This intelligent new platform will enable us to deliver authorities with the tools to increase the safety and stability of our communities." Lin Xijiang, Director, Huawei Solutions Middle East Development Centre, added, "The Huawei-Dragon INFO partnership will help us bring the power of AI to deliver better public safety to the Middle East. It falls in line with our joint aim to support the national visions and agendas of regional governments in building diversified, knowledge-based economies, and safe communities." Huawei's AI portfolio includes its new Ascend series of AI chips

– the world's first AI IP and chip series designed for a full range of scenarios. The portfolio also includes new products and cloud services that are built on Ascend chip capabilities. The Huawei-Dragon INFO collaboration will be enabled by the emerging 5G broadband digital ecosystem. Globally, Huawei was first to unveil a full range of end-to-end 3GPP-compliant 5G product solutions, covering the core network, bearer network, base station and terminals, and the world's first 5G chipset. Huawei is a pioneer in the emerging 5G technology which will provide users with multiple gigabit speeds within homes, offices and public spaces.



Huawei iLab Releases a White Paper to Help Move Medical Images to the Cloud

Huawei iLab has officially released its Medical Imaging Cloud Scenario White Paper. Using the current status of the healthcare industry and the service characteristics of medical images as a basis, the White Paper analyzes and identifies five application scenarios that are most closely related to operators, have the most commercial potential, and are most likely to be implemented: cloud image storage, imaging cloud application, cloud-based medical collaboration, cloud-based medical education, and cloud-based health management. This information can then be used by operators to develop the medical imaging cloud market. As medical imaging technologies continue to develop, the amount of image data being generated has grown enormously, a fact that now poses higher requirements on the data storage and processing capabilities of medical IT systems. A traditional

picture archiving and communication system (PACS) cannot read or share data sufficiently, and as a result, it is difficult to obtain the full application value of historical medical images. In the interim, China's National Health Commission (NHC) has proposed establishing a medical union and a regional healthcare system that promote collaborating over and sharing medical image data. Platform- and cloud-based medical image data is therefore becoming a trend of the industry. Operators can construct medical imaging clouds and connect them with information systems at medical institutions using cloud computing and Internet technologies, storing and sharing medical images on the cloud. By carrying out in-depth research into the features of medical image services, user experience requirements, and the overall business value, Huawei iLab has been able to identify for operators the most

commercial application scenarios.

Scenario 1: Cloud image storage

It implements the storage and interaction of large amounts of image data for medical institutions, and helps to achieve multi-level disaster recovery and backup. This in turn ensures that medical institutions can provide services continuously and stably in the event of a natural disaster, hard disk fault, hack, or human damage. This scenario is suitable for operators expanding their B2B cloud storage services.

Scenario 2: Imaging cloud application

The PACS is cloudified, and image data can be exchanged between multiple medical institutions. Images can also be read on the cloud. Cloud image processing functions, such as image comparison, image fusion display, and 3D reconstruction, help doctors find and diagnose causes of diseases quickly

and accurately, improving the overall efficiency of diagnoses. Mobile imaging clouds are also supported, which enables doctors and patients to view images and diagnosis reports anytime and anywhere, and facilitates communication between doctors and patients. This scenario is suitable for operators promoting their B2B cloud-based PACS and mobile image reading services.

Scenario 3: Cloud-based medical collaboration

Building regional imaging cloud centers and remote imaging consultation centers helps to implement the centralized storage and sharing of image data for the medical institutions in a specified region. This also serves to optimize the distribution of healthcare resources and improves the quality and efficiency of healthcare services, thereby facilitating the implementation of a hierarchical diagnosis and treatment system. This scenario is suitable for operators providing remote B2B imaging and consultation services for medical unions.

Scenario 4: Cloud-based medical education

Based on the medical imaging cloud platform, this implements functions such as online image lessons, live surgical demonstrations, VR/AR/MR virtual imaging lessons, and online image discussions. These functions are highly interactive. They overcome geographical constraints, make the distribution of quality medical education resources more balanced, and help to economize Chinese Government's investment in medical education. This scenario is suitable for operators providing B2B cloud image lessons and B2C live surgery broadcasts.

Scenario 5: Cloud-based health management

This implements a number of cloud services, including chronic disease and inspection data management. It provides online health consultations, online guidance, scheduled referrals, follow-ups, and extended prescription services. This saves patients' time, reduces pressure on medical institutions, and allows people to

consult on and manage their health more quickly and efficiently. This scenario is suitable for operators providing 2C online health consultation services.

Huawei iLab believes that with support from government policies and the development of cloud computing and Internet technologies, medical institutions are accelerating the deployment of medical imaging clouds. It also notes that more and more operators are stepping into the field of medical imaging clouds. With good network infrastructure, cloud-based data centers, and powerful O&M support, operators can join forces with ecosystem partners and build a holistic medical imaging cloud solution – one that significantly improves the efficiency and quality of healthcare collaboration and provides better services for doctors, patients, and medical institutions alike. In this regard, Huawei is keen to work with operators on accelerating the cloud transformation of the healthcare industry and expanding the industry's market space.



Etiad Etisalat (Mobily) Succeeds in Improving Its Revenues for the Fourth Consecutive Quarter

As a result of Mobily success in decreasing its quarterly losses, net losses for the first 9 months of 2018 showed a decrease in losses by 61.5%. Net losses for the first 9 months of 2018 amounted to SAR 202.9 million versus SAR 527.2 million in the first 9m of 2017. Revenues of the first 9m in 2018 increased by 2.1% to SAR 8,703 million versus SAR 8,524 million for the same period last year. This has been achieved despite the market, regulatory and economic challenges, including:

- (1) The reduction of mobile termination rates.
- (2) The continuous adverse impact from releasing the ban on VoIP application on international calls revenue.

By taking out the impact of the decrease of the mobile interconnection rates, revenues would have grown by 2.7% Gross profit increased by 4.5% to SAR 5,196 million for the first 9 months in 2018 versus SAR 4,970 million for the same period last year. This is mainly due to the reduction of cost

of sales as a result of reduction mobile termination rates. In addition, the company succeeded in the first 9 months of 2018 to raise EBITDA to reach SAR 3,190 million for the first 9 months of 2018 compared to SAR 2,734 million for the same period last year, an increase of 17%. This is reflecting the company efficiency in managing its operational expenses, the decrease in the general and administrative expenses and the reversal of certain provisions and the implementation of IFRS 15 and 9. EBITDA margin for the first 9m in 2018 reached 36.6% versus 32.1% for the same period last year. Furthermore, Mobily succeeded for the third consecutive quarter in reducing its losses, as Q3 2018 net losses reached SAR 30.9 million compared to SAR 174.4 million in Q3 2017 or a reduction by 82%. Q3 2018 revenues witnessed a YoY growth of 6.1%: Q3 2018 revenues amounted to SAR 2,976 Million compared to SAR 2,805.7 Million in Q3 2017. This is mainly due to the improvement in consumer

revenues, growth in FTTH sales and growth in business unit revenues driven by sales to government sectors. This was achieved despite the market, regulatory and economic challenges including the reduction of mobile termination rates. By taking out the impact of the decrease of the mobile termination rates, quarterly revenues would have grown by 8.0%. Additionally, Mobily succeeded to improving its EBITDA reaching SAR 1,088 million in Q3 2018 versus SAR 904 million in Q3 2017, or an increase of 20%. This is reflecting the company efficiency in managing its operational expenses, the decrease in the general and administrative expenses and the reclassification of SAR 84 million provision (built in Q1) from pre-EBITDA to post EBITDA, the reclassification did not affect the calculated net losses. EBITDA margin reached 36.6% for Q3 2018 versus 32.2% for the same quarter last year.



Nokia and Netia Deploy First Virtualized Distributed Access Architecture Cable Network in Europe

Nokia has announced that Netia, one of the largest regional telecommunication operators in Poland, will deploy its Unified Cable Access solution to significantly increase the network capacity needed to support surging bandwidth demands. Initially targeting the cities of Warsaw and Krakow, the deployment will create Europe's first fully virtualized Distributed Access Architecture (vDAA) cable network and enable Netia to deliver enhanced ultra-broadband services to residential and business customers and quickly expand its network into new service areas. Annual data traffic growth of 40-60% is placing enormous pressure on cable operators' Hybrid Fiber Coax (HFC) networks globally. To meet this growing demand, cable operators are turning to software-driven, all-IP Distributed Access Architectures (DAA), which increase the capacity of existing networks, reduce operating costs and improve signal quality. Estimated to be a \$1.6 billion market by 2022, DAA architectures are becoming essential for cable operators looking to rapidly deploy new services and cost-effectively upgrade their networks. Nokia's Unified Cable Access solution is based on a virtualized Distributed Access Architecture (vDAA) which delivers greater space and power savings, as well as superior architectural flexibility, compared to traditional DAAs. Nokia's Unified Cable Access solution will

enable Netia to establish a fully distributed and virtualized access architecture that can support new, competitive Gigabit and IPTV services over great distances. By moving the cable access layer functions in its headend and hub sites to the access nodes that sit closer to customers, Netia can eliminate some of its legacy cable-specific hardware and significantly extend its reach into new communities. It also can increase the performance needed to ensure a better internet experience for subscribers. Netia will begin deploying Nokia's Unified Cable Access solution, including the Gainspeed Access Controller and Gainspeed Access Nodes, into its network in Q4 2018. Once fully deployed, Netia will be able to effectively replace analog optical transmission with 10Gbps Ethernet, establishing an all-IP architecture capable of backhauling and transmitting digitized video over long distances. This will help reduce the space and power costs in the hub while significantly increasing the network's capacity, reach and signal quality, thus improving ultra-broadband services for its customers. Jaimie Lenderman, Senior Analyst at Ovum, said: "DAA is a key transformation in next generation cable access networks, enabling cable operators to deliver higher bandwidths and new service offerings to residential and business clients. Virtualized network functions and

automation optimize network capability, producing a more efficient and agile cable network. Furthermore, the business case for DAA enables operators to realize cost savings in the space-starved headend." Andrzej Abramczuk, President of the Board, General Director at Netia said: "To support the growing demand for new ultra-broadband services in Poland, we need to quickly grow our network in both capacity and reach. Nokia is the only vendor that can provide an innovative approach and solution that allowed us to achieve huge capacity gains and expand into new areas without augmenting the metro network we had in place. With Nokia's Unified Cable Access solution, we can more easily deploy and deliver new services that ensure our customers receive the best TV experience and fastest Internet speeds in Poland." Federico Guillén, President of Nokia Fixed Networks, said: "We are excited to be working with Netia to build a network capable of delivering some of Poland's fastest broadband speeds. Netia is stepping forward and distinguishing themselves as a technology leader. With Nokia's vDAA solution, Netia will be able to quickly enhance their network to deliver the additional capacity and reach they need to meet rising customer demand for ultra-broadband services."

Nokia to Publish Third-Quarter and January-September 2018 Results

Nokia will publish its third-quarter and January-September 2018 results on October 25, 2018 at approximately 8 a.m. Finnish time (CET+1). The financial report will be made available on the Nokia website immediately after publication. Nokia only publishes a summary of its financial reports in stock exchange releases. The summary focuses on Nokia Group's financial information as well as on Nokia's outlook. The detailed segment-level discussion will be available in the complete financial report available at www.nokia.com/financials. Investors should not solely rely on summaries of Nokia's financial reports, but should also review the complete reports with tables. Nokia's analyst conference call will begin on October 25, 2018 at 3 p.m. Finnish time. A link to the webcast of the conference call will be available at www.nokia.com/financials.



"In Q3 2018, we saw excellent momentum in orders, growth across all five of our Networks business groups, and improved profitability compared to the first half of the year."

Rajeev Suri
President and CEO

NOKIA

Nokia to Sharpen Customer Organization Focus as the 5G Era Accelerates and Announces Changes in the Composition of the Nokia Group Leadership Team

Nokia announced plans to realign its primary customer-facing organization into two regional groups: one covering the Americas and the other responsible for Europe, Middle East, Africa and Asia. The company also announced changes in the composition of the Nokia Group Leadership Team. "As we enter the 5G era, extreme customer focus is a must," said Nokia President and Chief Executive Officer, Rajeev Suri. "The changes we are announcing today will ensure that we continue to have the senior management capacity necessary for superb customer relationships in a world of increasing speed and complexity. I am extremely pleased that we have two very strong leaders, Ricky Corker and Federico Guillén, to lead these new groups." Ricky Corker is appointed President of Customer Operations, Americas. Corker is currently Executive Vice President and President North America, and he has played an instrumental role in returning the business in North America to growth and positioning Nokia strongly in 5G and other technologies. Prior to this he was Head of the Asia Pacific Region and held senior roles in Europe and Australia. He has a degree in Communications and Electronics from RMIT University in Melbourne, Australia. Corker will report to Suri and, effective January 1, 2019, will join the Nokia Group Leadership Team. Federico Guillén is appointed President of Customer Operations, EMEA & Asia. Guillén is currently President, Fixed Networks, where he has delivered consistently strong financial performance while also investing in future-oriented

opportunities such as the cable market. Prior to this he was President of Alcatel-Lucent Spain and head of the Telefónica account team. His extensive international experience includes leadership roles across Europe, Latin America, Middle East, Africa and India. He also sits on the board of Nokia Shanghai Bell. He has a degree in Telecommunications Engineering and a Master's degree in Switching & Communication Architectures from the ETSIT at the Polytechnic University of Madrid. Guillén will continue to report to Suri and remain a member of the Nokia Group Leadership Team. A new leader for Fixed Networks will be announced in due course. Ashish Chowdhary will continue to lead Customer Operations and remain a member of the Nokia Group Leadership Team until the end of 2018. He will then leave Nokia to take a leadership position in another company. "Everyone has a

time in their career when they want to try something new and, after 15 successful years at Nokia, Ashish has reached that moment," said Suri. "The decision to leave Nokia was his alone, but he goes with my full support. Ashish has been a close friend, confidant and business partner for many years. He is a person with deep integrity, far-reaching insight, strong leadership skills and a work ethic like few others. I am pleased that he will be joining one of the world's great companies in a prominent role, and I wish him every success." As a result of these changes, Nokia's Group Leadership Team will, effective January 1, 2019, consist of the following members: Rajeev Suri, Basil Alwan, Hans-Juergen Bill, Kathrin Buvac, Ricky Corker, Joerg Erlemeier, Barry French, Sanjay Goel, Bhaskar Gorti, Federico Guillén, Kristian Pullola, Sri Reddy, Marc Rouanne, Maria Varsellona and Marcus Weldon.

Nokia is stepping up a gear

- Accelerating strategy execution**
Creating an Enterprise Business Group and better aligning Nokia's structure to our strategy.
- Sharpening customer focus**
Speeding up our strong 5G momentum and strengthening in Cloud Core.
- Optimizing operating model**
Ensuring our disciplined operating model remains a real source of competitive advantage.

"With the successful Alcatel-Lucent integration and cost-saving program soon to be behind us, we are taking steps to accelerate the execution of our strategy and sharpen our customer focus."
Rajeev Suri, CEO

NOKIA

Nokia and Samsung Extend Their Patent License Agreement

Nokia announced, in conjunction with its results announcement for Q3 and January-September 2018 that it has extended the patent license agreement between Nokia and Samsung, which would otherwise have expired at the end of 2018. Under the agreement, Samsung will make payments

to Nokia for a multi-year period beginning 1 January 2019 onwards. The terms of the agreement remain confidential between the parties. "Samsung is a leader in the smartphone industry and has been a Nokia licensee for many years," said Maria Varsellona, Nokia Chief Legal Officer and

President of Nokia Technologies. "We are pleased to have reached agreement to extend our license. This agreement demonstrates the strength of our patent portfolio and our leadership in R&D and licensing for cellular standards including 5G."

Nokia AVA Helps Hutchison 3 Increase Network Efficiency and Improve the Customer Experience in Indonesia

Nokia is helping Hutchison 3 Indonesia increase network efficiency on the operator's LTE network and boost the customer experience. Using Nokia's Spectral Performance Management solution has led to a 17% increase in Hutchison 3's spectral efficiency, meaning more mobile broadband for more subscribers, with faster data speeds and a more reliable service. Hutchison 3 Indonesia wants to provide the best quality service, especially for younger subscribers who are using bandwidth-hungry applications such as video and mobile gaming. Due to high growth in subscribers and traffic, the operator must make the most out of its LTE radio network resources without adding hardware, spectrum or cell sites. Nokia's spectral performance management technology has enabled Hutchison 3 Indonesia to proactively identify and resolve network performance issues and provide the best quality service for its growing subscriber base. Nokia AVA's cloud-based analytics generates automated recommendations that improve spectral efficiency and help prioritize investment in additional capacity. Nokia AVA collects, stores and analyzes data from multiple sources, including Minimization of Drive Test (MDT) data. A 3GPP feature, MDT enables the collection of performance data from Nokia and other vendors' networks, tapping into billions of anonymized measurement reports sent by ordinary mobile phones. Machine Learning algorithms, developed by Nokia's services experts in partnership with Nokia Bell Labs, analyze the data and identify patterns of

usage and network behavior to provide highly granular, sub-cell level insights about subscriber density, application throughput and radio signal performance. This forensic level of analysis helps network engineers understand where capacity is running out and how data throughout can be increased while predicting future demand from subscribers. These granular insights allow Hutchison 3 Indonesia to plan more accurately and increase the return on network investments including, future-proofing its evolution to 5G. Desmond Cheung, CTO of Hutchison 3 Indonesia, said: "We provide high quality 4G data services with particular focus on the millennial across Indonesia. We are very pleased that Nokia and their Spectral Performance Management solution, using the latest innovations in AI and machine learning, help us to reduce the latency and increase capacity so that our customers can respond to their mobile games much quicker and enjoy superior video quality."

John Byrne, Service Director for Global Telecom Technology and Software at research firm GlobalData, said: "Mobile operators of all stripes face the same reality: network demand continues to increase, but available spectrum generally stays the same. As a result, they must do everything they can to squeeze more capacity and performance out of the same pipe. Analytics-informed artificial intelligence plays a vital role in ensuring strong network performance and maximizing spectral efficiency." Dennis Lorenzin, Head of the Network Cognitive Service unit at Nokia, said: "Spectrum is a finite resource, so making the most out of it is the smart thing for any operator to do. Hutchison 3 Indonesia is addressing head-on the challenge posed by growing subscriber numbers and new bandwidth-hungry apps such as video and gaming. With the help of Nokia AVA, they can improve network efficiency and boost the experience for their subscribers."



Nokia, Telia Take 5G to the Ports, Test Tech in Electricity Grids

Telia's emerging businesses arm Division X and Nokia taking part in a series of industrial trials exploring how 5G's ultra-reliable low latency communications (URLLC) can aid smart electricity and harbor automation. The telcos are part of the Wireless for Verticals research project, comprising the public sector body Business Finland, academic organizations and enterprises. Nokia worked with automation company ABB in the first trial, which showed how

URLLC could be deployed to ensure faults are near instantly reported in medium voltage electricity networks. Low latency communications would ensure a network would keep running, personnel will be kept safe and equipment will remain undamaged. Petri Hovila, Program Manager at ABB, said: "Managing power distribution networks with an increasing amount of distributed energy resources and an increasing need of flexibility

requires advanced technology for protection, control and monitoring. "The 5G URLLC technology provides an affordable communication platform for deployment of these advanced technologies. The results of the WIVE project are encouraging for future utility-scale implementation of 5G." A second trial, involving Nokia and cargo handling company Kalmar, used URLLC to advance the automation of container yard operations. Automation research

Director Pekka Yli-Paunu from Kalmar said: "Network slicing in 5G networks brings a higher level of predictability and control for our safety-related applications. 5G connections should work at the same level of reliability, latency, and bandwidth as cables, and its management should be simple enough." Participants in WIVE have said that 5G would present a huge economic potential to the industrial internet, ensuring the quality of safety automation, remote control of hardware and energy efficient power and storage. Mikko Uusitalo, Head of wireless advanced technologies research at Nokia, said: "Industry collaboration is essential in fostering innovation around 5G and for enabling different industries to take full advantage of the promises of 5G, especially the low latency combined with high reliability. "The WIVE project has provided us with greater insight into the requirements and opportunities for experimentation to test our solutions. In this project, Nokia created concepts of how to make 5G URLLC possible and implemented some of these technologies as a prototype that has been tested. It is great to see the solutions moving towards reality." Tomi Sarajisto, Research Manager from Telia Company's emerging businesses unit Division X said: "Within the WIVE



project we are working with participating companies to accelerate the industrial revolution in Finland. Telia has explored new areas where 5G solutions will most likely produce breakthroughs in introducing new, more effective processes. In the trials we studied how lightning-fast 5G will advance electricity grid infrastructure protection and harbor automation."

BSNL Selects Nokia for Smart Pole Deployment across India

Nokia has been selected by Bharat Sanchar Nigam Limited (BSNL) to support the transformation of India's cities through intelligent infrastructure. Nokia will supply, install, commission and maintain the Smart Telecom Poles across India in all of BSNL's telecom circles. Under the contract, Nokia will also integrate the poles with smart LED lighting systems, CCTV cameras, digital billboards and environmental sensors that provide strong revenue generation potential for the operator. The smart pole has been designed for emerging markets and built in India based on Nokia's global services expertise. The Indian urban landscape is evolving, with government and city administrations gearing up to ensure the safety and security of citizens and provide them a better quality of life. BSNL, in line with the Indian government's Smart Cities Mission, is exploring and taking the lead to digitalize cities. With

its Smart Telecom Pole and services expertise, Nokia will help BSNL provide access to mobile connectivity and smart solutions for citizens while ensuring the poles meet the aesthetic and spatial needs in modern cities. Nokia will optimize the telecom infrastructure to provide a shared, secure and scalable platform that ensures the best use of urban resources and prepares BSNL for the needs of new technologies such as IoT and 5G. The pole can be adapted to diverse geographical environments and climate conditions. It also houses a custom-designed power backup solution to provide continuity of services during power outages. Anupam Srivastava, Chairman and Managing Director at BSNL, said: "We at BSNL are committed to India's socioeconomic development. Telecommunications can make a great impact on people's lives and with the new technologies and innovation

that opportunity will only grow. Nokia is already one of our key partners in deploying our network around the country, and we're delighted to be working with them on the smart pole opportunity and showcasing our capabilities for the future smart cities." Sanjay Malik, Head of the India Market at Nokia, said: "At Nokia, we're proud to be at the forefront of driving transformation together with our customers and industry stakeholders. Our Smart Telecom Pole can help ensure urban assets and data are efficiently used while opening new revenue streams. With Nokia's deep knowledge and expertise, we have the ability to customize the solution for various use cases to meet India's smart city infrastructure requirement. By supporting BSNL's smart city initiatives with the latest solutions and services, we also help build the increasingly digitized and connected India of the future."

Nokia Establishes Access Networks Division to Fully Exploit the Opportunities of 5G and Announces Changes in the Composition of the Nokia Group Leadership Team

Nokia announced further steps to align its organizational structure to its strategy, strengthen its leadership team and position the company for success in the

5G era. "Nokia has a unique advantage in the 5G era with its end-to-end portfolio," said Nokia President and Chief Executive Officer, Rajeev Suri. "By creating a single

Access Networks organization that includes both fixed and mobile, we can improve our customer focus, simplify our management structure, and more

efficiently leverage our full portfolio." The Access Networks Division will consist of Nokia's current Mobile Networks and Fixed Networks Business Groups, with the change to take effect on January 1, 2019. The new leaders of Mobile Networks and Fixed Networks Business Groups will report to the President of Access Networks who will be named in due course. Effective immediately, Tommi Uitto is appointed President of Mobile Networks. Uitto is a 23-year Nokia veteran, an expert in radio technologies, and well-known to customers around the world. His most recent role has been leading Mobile Networks Product

Sales since the acquisition of Alcatel-Lucent. As previously announced, Nokia plans to announce a President of Fixed Networks in due course. "Tommi is a strong leader with the right background in both sales and product development and I am pleased that he has accepted this role," said Suri. "He brings deep credibility from across the telecommunications industry and a proven ability to drive product leadership and business performance." With these changes, Marc Rouanne, who has been serving as President of Mobile Networks, will leave Nokia. "I want to thank Marc for his contributions to Nokia

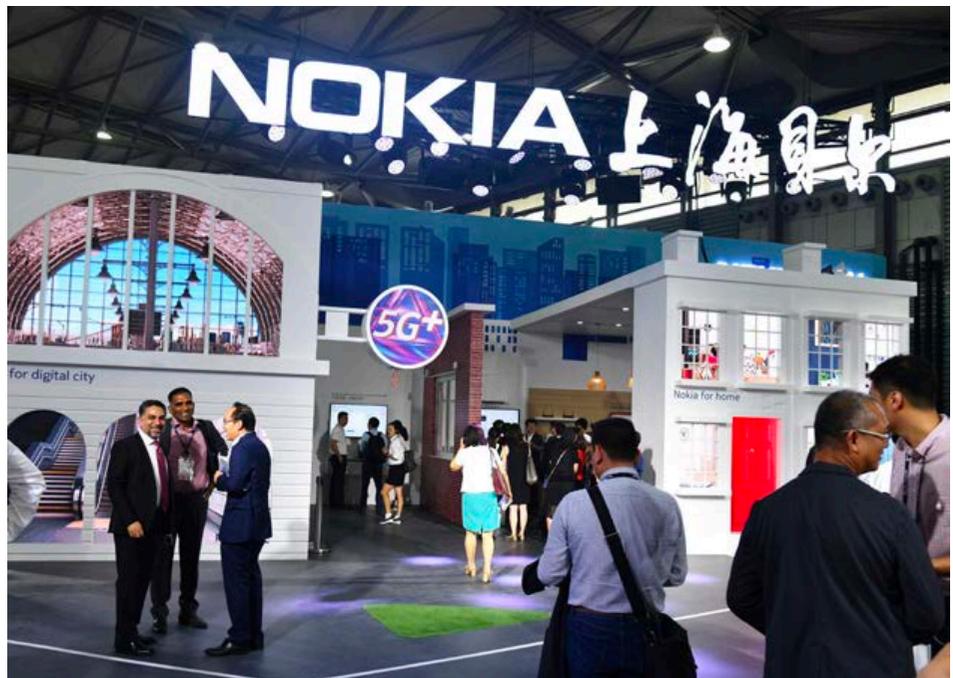
and wish him well in the future," said Suri. As a result of these changes, Nokia's Group Leadership Team will now consist of the following members: Rajeev Suri, Basil Alwan, Hans-Juergen Bill, Kathrin Buvac, Ashish Chowdary, Joerg Erlemeier, Barry French, Sanjay Goel, Bhaskar Gorti, Federico Guillén, Kristian Pullola, Sri Reddy, Maria Varsellona and Marcus Weldon. As announced earlier, Chowdary will step down and Ricky Corker will join as of January 1, 2019. The President of Access Networks will be appointed in due course and will also join the Nokia Group Leadership Team.

China 5G Push Nets Nokia €2B in Operator Deals

Nokia struck separate agreements worth more than €2 billion with China Mobile, China Telecom and China Unicom to boost mobile and fixed networks across the country, as the operators prepare to transition to 5G. The deals, signed at the China International Import Expo in Shanghai, will see Nokia deliver a range of 4G radio and fixed access equipment and services to the three operators through to the end of 2019. In a statement, the Finnish vendor said the services will help the operators to meet growing network needs as the country transitions towards 5G, with demand for mobile internet continuing to rise in China. Nokia will no doubt be hoping the deals stand it in good stead for when the three operators in the world's largest mobile market award network contracts for 5G commercial deployment (expected sometime in the next two years). It will be fighting western rival Ericsson as well as home players Huawei and ZTE for the deals. In July Nokia struck a major 5G deal to supply end-to-end equipment and services for T-Mobile US, which was worth \$3.5 billion. The vendor previously said it expects its end of year performance to be boosted as 5G spending increases, following lacklustre earnings in the first half of 2018. In its Q3 financial report, CEO Rajeev Suri said its early progress in 5G was strong, while indicating a strong win rate for deals. Nokia said it will deliver a range of

technologies for China's largest operator, China Mobile, including radio access, core and passive optical networks; IP routing and optical transport; SDN; network management; and professional services. zaFor China Telecom, the vendor will work to improve the operator's countrywide 4G LTE coverage; FDD-LTE radio access; deploy its end-to-end portfolio; enhance 5G cooperation; and work together to accelerate the country's 5G progress. China Unicom, will benefit from a range of

Nokia technologies as it aims to enhance network quality and capacity to grow its 4G customer base; explore 5G evolution and artificial intelligence in its networks; and expand IoT services. Mike Wang, president of Nokia Shanghai Bell said the company was "excited to continue our close collaboration with these important customers in China, to drive new levels of network performance as they transition toward 5G".



Nokia and Hotwire Deploy XGS-PON Fiber Technology to Bring New Ultra-Broadband Services to Customers in Florida and North Carolina

Hotwire, one of the leading US fiber-optic telecommunications providers specializing in residential and commercial services, will deploy Nokia's XGS-PON1 fiber solution to enhance its network and deliver new, high-quality 10Gbps broadband services to its customers. The roll-out brings some of the fastest broadband speeds to Hotwire's Florida and North Carolina customers, including Salisbury, North Carolina - Hotwire's latest public-private partnership - and will expand to support other such partnerships in the future. Hotwire's deployment of Nokia's XGS-PON solution reflects its commitment to continually develop the capabilities and speed of its market-leading network, and is an important step towards extending new ultra-broadband services such as streaming video in 4k, 8k and 12k. The deployment also provides a

cost-effective upgrade path for Hotwire's existing fiber network, which covers most of the US east coast, allowing the company to seamlessly move from GPON (2.5Gbps) to XGS-PON (10Gbps) using the same access node. Jonathan Bullock, VP of Corporate Development & Government at Hotwire, said: "From the beginning, Hotwire has focused on deploying cutting-edge technology to ensure our customers experience the very best of broadband. This is why we invest in future-proof fiber and build direct fiber infrastructure into every home and business we serve. We're now making that network even faster for our customers by rolling out the first 10-Gigabit service in Florida and North Carolina. Hotwire is excited to partner with Nokia, which is at the forefront of next-generation PON technology. With Nokia's solution, we can radically enhance the capacity of our

network with minimal impact or network upgrades." Federico Guillen, president of Nokia Fixed Networks business group, said: "We are excited to help Hotwire kick off their 10Gbps service and provide the tools, resources and expertise they need to deliver better, faster and smarter ultra-broadband access to customers in Florida and North Carolina. With a proven track record of next-generation fiber technology deployments, we were able to demonstrate how our XGS-PON solution could help provide a cost-effective path to 10Gbps and support the enhanced ultra-broadband services Hotwire required. We look forward to continuing supporting Hotwire as it provides best-in-class broadband to its residential, commercial and government customers throughout the US Southeast."

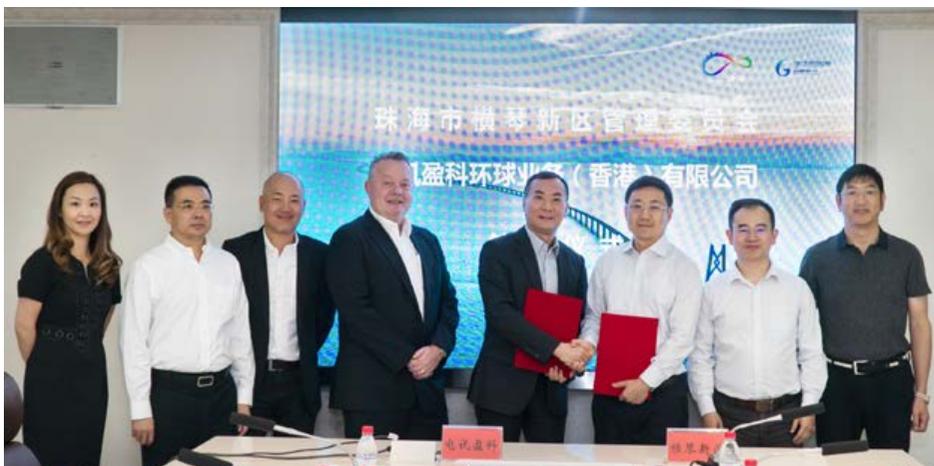


PCCW Global and Administration Committee of Hengqin New District Sign Collaboration Agreement to Foster Smart City Development

The Administration Committee of Hengqin New District and PCCW Global have signed a collaboration agreement to capture opportunities brought by the opening of the Hong Kong-Zhuhai-Macao Bridge and the Greater Bay Area development, and to accelerate the cooperation among Guangdong, Hong Kong, and Macao in the fields of telecommunications and technological innovation. Located 34 sea

miles from Hong Kong, Hengqin offers massive trade and business potential. It is optimally located, covering an area of 106.46 square kilometers and is less than an hour's travel from Hong Kong via the newly opened Hong Kong-Zhuhai-Macao Bridge. Based on this collaboration agreement, the two parties will engage in in-depth cooperation in such areas as Internet of Things (IoT), smart city

development and artificial intelligence (AI). PCCW Global has established a wholly-owned subsidiary in Hengqin New District to build and operate a next generation IoT smart city R&D services platform, international IoT operation platform, Guangdong-Hong Kong-Macao Greater Bay Area AI training and demonstration centers, and operation centers. PCCW Global is the international operating division of HKT, Hong Kong's premier telecommunications service provider. HKT offers a wide range of telecom services in Hong Kong. PCCW Global's network spans more than 3,000 cities and 150 countries, supporting a portfolio of integrated global communications services and covering most of the countries under the "One Belt One Road" initiative. PCCW Global is headquartered in Hong Kong, and maintains regional centers in Australia, Belgium, China, France, Greece, Japan, Korea, Singapore, South Africa, the United Arab Emirates, the United Kingdom and the United States of America.



PCCW Global's Console Connect Announces On-Demand Direct Connections to Google Cloud across Asia, Europe and the Americas

PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, announces support for Google Cloud Partner Interconnect by providing enterprises direct, on-demand connections to the Google Cloud platform. PCCW Global's Console Connect provides Google Cloud customers with fast, low-latency, and secure direct connectivity from the PCCW Global Tier 1 IP network which spans more than 150 countries around the globe. Console Connect provides Google Cloud customers with on-demand, direct access to their business-critical applications, and can connect any and all points in customer networks with simple-to-use, yet sophisticated, automation software that eliminates the complexity of network configuration. It also enables enhanced performance, visibility, monitoring, and security, while providing additional reach for Google Cloud Partner Interconnect customers. Console Connect also brings enterprises and cloud providers together into a unique

networking community created by and for network engineers from around the world. The complete solution includes the tools needed to manage multiple secure direct connections, monitor connection performance, and view bandwidth allocation and utilization. Google Cloud Partner Interconnect is available now across Europe, Asia and the Americas, and is one of the many cloud and SaaS providers offered via Console Connect. Mr. Paul Gampe, Chief Technology Officer of

PCCW Global, said, "Connecting the Google Cloud platform to Console Connect at multiple points around the world enables businesses to quickly establish secure and high performance direct connections to business-critical workloads in the cloud. The agility and performance benefits of Google Cloud Partner Interconnect integrate perfectly with a superior cloud networking experience offered by Console Connect."



ITW Global Leaders' Forum Demonstrates How Blockchain Can Transform Inter-Carrier Settlement



ITW Global Leaders' Forum (GLF) has announced the successful completion of a multi-lateral blockchain Proof of Concept (PoC) involving several of its members. The PoC, led by PCCW Global and Colt Technology Services, in collaboration with BT, Orange, Telefonica and Telstra, has demonstrated the viability of a platform that can settle voice transactions between multiple carriers in minutes rather than hours. The breakthrough is the latest in a series of blockchain PoCs carried out by GLF members

and supported by technology partner and blockchain specialist Clear. The trial just completed is the first to involve a multi-lateral series of relationships among the wholesale telecommunications industry, and points to a future of secure and frictionless settlement across the sector. The GLF is now reviewing options around a potential governance structure to develop the technology further and implement a solution for the industry that replaces existing and cumbersome processes for settlement of voice as well as other types of transactions, examples such as mobile roaming or data on demand. Mr. Marc Halbfinger, Chief Executive Officer of PCCW Global and the Chairman of the GLF, said, "We are very pleased that this latest Proof of Concept has expanded to include more carriers. It has been a strong belief within the GLF that innovative technologies such as blockchain can be harnessed to improve the overall efficiency of the industry, and it is now clear that the industry can look forward to the benefit of becoming further aligned. Industry cooperation in this area will be a game changer for the whole sector." Mr. Carl Grivner, Chief Executive Officer of Colt, said, "Following the successful trial with live data by Colt and PCCW Global, it was an important next step to prove the use case for blockchain technology in our industry by repeating it with multiple carriers. This latest PoC signals

nothing less than the future of telecoms, whereby intensive manual practices can be securely automated across the wholesale ecosystem. This is a major step forward by Colt and its partners, meaning we can now invest further resources into driving both our and our customers' businesses forward using the power of blockchain." The first GLF-backed PoC saw PCCW Global and Colt working bi-laterally to demonstrate how the inter-carrier settlement of wholesale international voice services could be automated through the use of blockchain. By using technology from Clear, the two partners were able to reduce a normally labor-intensive process from hours to minutes. The PoC was expanded in May, when BT, Orange, Telefonica and Telstra joined the trial to study the viability of the blockchain platform to settle traffic

in a multi-carrier environment. The PoC was able to demonstrate that the initial trial that saw successful input of live data feeds into the ledger, enabling traffic to be automatically verified and settled between two carriers, could be scaled to work across multiple touchpoints. Mr. Damien Staples, Vice President, Global Wholesale Voice, BT, said, "BT is pleased to have joined this initiative aimed at simplifying key settlement activities between leading global carriers. It is essential that the carrier industry innovates to reduce complexity and reduce operating costs. This PoC has been an important stepping stone in that journey." Mr. Pierre-Louis de Guillebon, Chief Executive Officer of Orange International Carriers, said, "It was essential to establish that blockchain-powered settlement of international voice

transactions could be done on a multi-lateral basis and in a secure environment that is able to handle the fast pace of transactions between operators. We are proud to have been a part of that proof." Mr. Juan Carlos Bernal, Chief Executive Officer of Telefonica's International Wholesale Business, said, "We believe that blockchain has the potential to drive forward the entire wholesale sector, helping it to gain efficiency as well as acting as a sound base for the launch of vital new services." Mr. Oliver Camplin Warner, Telstra's International Sales and Service Executive, said, "We are delighted to be part of this pioneering PoC to explore how blockchain can bring increased efficiency, productivity, scalability and security to wholesale telecommunications transactions."

PCCW Global and HENGTONG Group to Connect Three Continents with High Speed PEAC



PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, and Chinese technology and industrial giant, the HENGTONG Group, have signed a cooperation agreement to connect China to Europe and Africa via the Pakistan East Africa Cable Express (PEACE) undersea cable project, a new high-speed connection which is planned to go live in early 2020. When complete, the high-speed PEACE cable system will offer the shortest routes from China to Europe and Africa, interconnecting three of the world's most populous continents whilst at the same time dramatically reducing latency, delivering a superior connectivity experience which will be ideal for a vast array of commercial and consumer applications. Traditionally under-served, Africa has the fastest-growing youth population in the world and is a market particularly ripe for investment because of the rapidly growing number of Internet users and increasing demand for connectivity to, and across, Africa. The backbone of the project will connect Pakistan, Djibouti, Egypt, Kenya and France, providing critical interconnections to key Asia, Europe, and Africa economic corridors, while other routes and connection agreements will stretch to South Africa, with planned landing points

en route. PCCW Global and HENGTONG will cooperate to steer the overall project. Another PEACE collaborator, Huawei Marine, is already engaged with the construction of a primary segment of the 12,000km-long PEACE cable. PCCW Global is the manager of the commercial side of the cooperation and is responsible for all capacity services and landing party arrangements, in addition to bundling capacity on the new submarine cable with existing network products and services. Innovative new technologies are being deployed in the construction phase of the project which will enable each country's bandwidth allocation to be modified during the lifetime of the cable. Once the cable is live, individual cable stakeholders will have the ability to design the network to their own specifications, without impacting others using the same cable system. The PEACE cable project also paves the way for PCCW Global and HENGTONG to collaborate on other regional connectivity projects as well as the establishment of smart cities across multiple continents. Mr. Sameh Sobhy, Vice President, Middle East & North Africa, PCCW Global, said, "We are proud that two such reputable industry leaders – HENGTONG Group and Huawei Marine – have entrusted us and our expertise in cable planning and management to be the commercial channel for the PEACE project." Mr. Sun Xiaohua, Vice President, HENGTONG Marine, a subsidiary of HENGTONG Group, said, "We see the PEACE project as a strategic pivot for the HENGTONG Group to grow from our experience as a subsea cable investor and look forward to identifying new investing opportunities in this market in the future. We are extremely proud to have appointed PCCW Global and Huawei Marine as key collaborators in this project and to achieve a more effective approach for the investment. It is the power of this cooperation that is spearheading the deployment and commercialization of better connectivity between Europe, Asia and Africa."

PLDT Enterprise Rolls Out Global Business Voice Services in Collaboration with PCCW Global

Following a successful launch in the Philippines, PLDT Enterprise, the B2B arm of PLDT, the leading ICT and digital services provider in the Philippines, is on track to roll out a suite of global Unified Communications-as-a-Service (UCaaS) business communication services to multinational companies, using technology and international presence provided by PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider. Traditionally operating out of Manila, PLDT Enterprise's development roadmap for the new global UCaaS offering will enable the service provider to expand beyond its home market to serve multinational companies across multiple regions, while simultaneously capturing global revenues. By connecting to PCCW Global's worldwide network and points of presence, PLDT Enterprise is able to serve 21 countries across four continents, providing access to over 73% of the global UCaaS telecommunications market. PLDT Enterprise's PLDT Cloud UC offers businesses with a reduced total cost of ownership and provides enterprise-wide extension dialing and self-service provisioning. Enterprise customers

also benefit from predictable monthly telecommunications costs for their global footprint, while billing itself can be provided via a single, centralized invoice for each regional office. Furthermore, the modern telecommunications technologies that are being made available through the UCaaS offering enable businesses to take advantage of more productive management techniques. Flexible seating through telecommuting enables employees to organize their own lives, thereby boosting both staff retention and productivity. Telecommuting removes the hassle and cost of the daily commute by allowing employees to connect to the workplace from home. Instead of insisting on fixed work hours, "flex time" enables employees to pick a schedule that best suits their needs. While modern management and working styles provide advantages, success hinges on modern and effective communications that are able to keep colleagues and customers in contact, regardless of their respective geographic locations. PLDT Cloud UC allows anyone to be just a call, or even a video enabled conference call away. PLDT Enterprise's global teams are increasingly relying on enterprise voice technologies

to gain a competitive advantage. PCCW Global's enterprise voice solutions enable knowledge sharing, faster circulation of information and improved decision-making processes – all advantages that ultimately lead to the quicker introduction of products and services to market. The global solution that PLDT Enterprise plans to roll out will enable businesses to scale their communications via an agile deployment, minimizing upfront capital expenditure while reducing overall time to provide services. Connectivity and access will be provided using PCCW Global's resilient and international fiber network that spans over 3,000 cities in 150 countries, including relationships with over 200 operators. This year, PLDT Enterprise expanded its fixed, wireless, and ICT services, digitally enabling key industries to meet their growing demands. The B2B arm posted a 9% revenue growth as more and more businesses shift to digital. Mr. Marc Halbfinger, Chief Executive Officer, PCCW Global, said, "PLDT has excelled in its home market by providing excellent customer service, backed with reliable and robust technology and connectivity. We are excited to work with PLDT to expand its offering to compete on a global scale, expanding its target market across multiple countries and regions with a rapidly scalable infrastructure." Mr. Jovy Hernandez, Senior Vice President and Head of PLDT & Smart Enterprise Business Groups, said, "We are very privileged to have expanded our collaboration with PCCW Global to further elevate the communication capabilities of enterprises in the Philippines. There is still an increasing demand for voice services in the workplace, and we are committed in meeting that demand with the best solutions and services for our customers and the people they serve in turn."





Tech Mahindra and Rakuten Collaborate to Set Up World-Class 5G Labs in Tokyo and Bengaluru

Tech Mahindra, a leading provider of digital transformation, consulting and business reengineering services and solutions, and Rakuten Mobile Network Inc., the mobile network subsidiary of Rakuten Group, the Japan-based global leader in internet services, signed an MoU (Memorandum of Understanding) to collaborate on building world-class next generation (4G & 5G) software defined network laboratories in Tokyo and Bengaluru. This collaboration will drive innovation to bring about the transformation of mobile network technology and enhance customer experience for users in Japan. The announcement comes on the sidelines of Prime Minister Narendra Modi's visit to Japan and meeting with Prime Minister Shinzo Abe to further strengthen Indo-Japan business ties. With this collaboration, Rakuten and Tech Mahindra aim to build a

world-class 5G ready network lab which will be one of its kind in the industry. With Tech Mahindra's capabilities in the 5G domain - Mobile Networks, IT, Cloud and Enterprise Applications, and Rakuten's vision to create a resilient fully automated 5G ready network in Japan and beyond, the labs in Tokyo and Bengaluru will focus on fostering innovation in the telecom space. Tech Mahindra will also provide network integration capabilities to add value to the lab operations. CP Gurnani, Managing Director & Chief Executive Officer, Tech Mahindra said, "5G has the capability to unlock unprecedented opportunities in every industry vertical and domain. Our collaboration with Rakuten will help us further drive innovation in the 5G space, and enable us to enhance customer experience and lead the transformation in mobile network technology from the forefront".

Mickey Mikitani, Chairman, President and CEO, Rakuten, Inc. said, "Rakuten is on the path to launching the most disruptive innovation in the mobile industry to date to consumers in October 2019, delivering unprecedented convenience to users across our ecosystem of over 70 e-commerce, fintech and communications services. As we prepare for this launch, we are very excited to collaborate with Tech Mahindra to launch world-class labs in Tokyo and Bengaluru that will contribute to creation of the next generation of mobile broadband, enabled by 5G, and the transformation of industries across the globe." As part of the TechMNxt charter, Tech Mahindra has a deep focus on 5G technology and is currently engaged with multiple service providers globally on their network transformation journey.



VIVA Bahrain Introduces eSIM Technology

VIVA Bahrain, the Kingdom's leading telecom operator, announced the launch of the revolutionary eSIM technology, available for the first time in Bahrain. VIVA's innovative eSIM service offers flexibility and convenience by enabling customers to use both SIM card slots available in their Apple devices, such as iPhone Xs, Xs Max or Xr. VIVA subscribers can seamlessly switch between multiple lines without the

need for a physical SIM. Additionally, for those who wish to continue the use of their physical SIM, they can still use it in conjunction with the eSIM technology and thus have two lines active on their phone. All VIVA post-paid and pre-paid subscribers using the iPhone Xs, Xs Max or Xr devices can take advantage of the new service instantly. Customers who are interested in activating an eSIM can visit any of the 19

VIVA retail stores for assistance with the installation of the eSIM add-on. VIVA Chief Commercial Officer, Karim Tabbouche said, "We are pleased to be the first to introduce the eSIM technology in Bahrain, which will simplify the mobile experience for our VIVA customers. This is a great example of our dedication to always be pioneers in telecom and digital innovation within the Kingdom"



introducing eSIM
another **VIVA** first
get yours today!



Yahsat Planning Successor for Thuraya Fleet

With the acquisition of fellow Emirati satellite operator Thuraya completed this August, Yahsat is planning to order two replacement satellites by the end of 2019 to continue Thuraya's L-band connectivity service. Executives from Yahsat and Thuraya said having both UAE operators under the ownership of the state-owned Mubadala Investment Company gives solid footing for Thuraya to jumpstart fleet refresh plans from 2016 that had stalled out. "The continuity of service for all of the customers of Thuraya is key and paramount," Masood M. Sharif Mahmood, CEO of Yahsat, said during a September interview at the World Satellite Business Week conference in Paris. "And the fact that we are well capitalized and owned by a shareholder that is very well capitalized and owned by the government in Abu Dhabi should give a lot of confidence." Dubai-based Thuraya had announced plans at World Satellite Business Week two years earlier for a geostationary constellation that would replace its two aging L-band satellites by 2020 with more powerful satellites carrying L- and Ka-band capacity. Funding delays and the February 2017 departure of CEO Samer Halawi for Intelsat by way of OneWeb clouded that program, known as "Futura." Mahmood said Thuraya's new satellites "might not be exactly the same concept that the previous management team had," but plans are moving ahead to replace the 10-year-old Thuraya-3 and 15-year-old Thuraya-2 spacecraft. Thuraya's new CEO, Ali Al Hashemi, said he is confident

Mubadala — a sovereign wealth fund with \$45 billion in revenue and \$125 billion in assets — will bankroll the new satellites provided Thuraya presents a solid business plan. "Mubadala has a coherent process of how to get the funding and we think we have a big story to [tell] Mubadala to get the funding for the next two satellites," he said. Hashemi said Yahsat and Thuraya's owner provides more than just ready capital. "They have big investments in artificial intelligence, data centers, [Internet of Things] solutions, aerospace and manufacturing, and semiconductors — all this can be leveraged to enhance our services," he said. The two Boeing-built satellites Thuraya operates today were designed to last at least 12 years, meaning Thuraya-2 is already three years past its expected end date. Geostationary telecom satellites often last beyond their design lives, but eventually run out of fuel and are forced to retire. Hashemi said discussions are underway with five satellite manufacturers for the replacements. Hashemi, who is also Yahsat's general manager of government solutions, said Yahsat and Thuraya have two committees working on the next-generation satellite system, one on the spacecraft and the other on the ground segment, including user devices and applications. Hashemi said Thuraya's target is to sign a contract for the two replacement satellites by the end of 2019. "Mubadala will back us if we have our fundamentals right," he said. One difference between Thuraya's Futura plan and the new plan under Yahsat ownership

is an emphasis on deepening Thuraya's presence in regions covered by its current satellites rather than expanding to global coverage. Mahmood said Thuraya's existing L-band coverage area, which includes most of the world except for the Americas, still encompasses markets the company hasn't penetrated. Yahsat is open to global coverage for Thuraya, "but as a priority it comes second," he said. Yahsat also brings Ka-band coverage over the Middle East, Africa, Brazil and parts of Asia through its three-satellite fleet. Hashemi said Thuraya wants to create products that leverage the signal strength of L-band with the high-throughput ability of Ka-band. "After 10 years, the long-term vision is you have one device as a user," he said. "You don't know if it is L-band or Ka-band. If you are going to Facebook or video streaming, it will be immediately switched to Ka-band, but if you want to send an emergency signal to your parents, or to the police, it will be L-band. That will be the future." Hashemi declined to state Thuraya's revenue, citing the operator's status as a private company. He said Thuraya has been performing "excellently" in commercial markets, but has lagged behind in government services. Thuraya will seek new business with the UAE, which is already a Yahsat customer, and other governments, he said. Thuraya said by email it has around 300,000 active subscribers for voice and data services. For comparison, competitor Iridium has nearly 1.1 million subscribers.

Yahsat Launches MYSAT-1 CubeSat to the ISS

Yahsat, UAE-based global satellite operator, wholly-owned by Mubadala Investment Company, and Khalifa University of Science and Technology, a research university dedicated to the advancement of learning through the discovery and application of knowledge, and Northrop Grumman Corporation, a global security company, has announced the successful launch of the MYSAT-1 CubeSat to the International Space Station (ISS) on board the Northrop

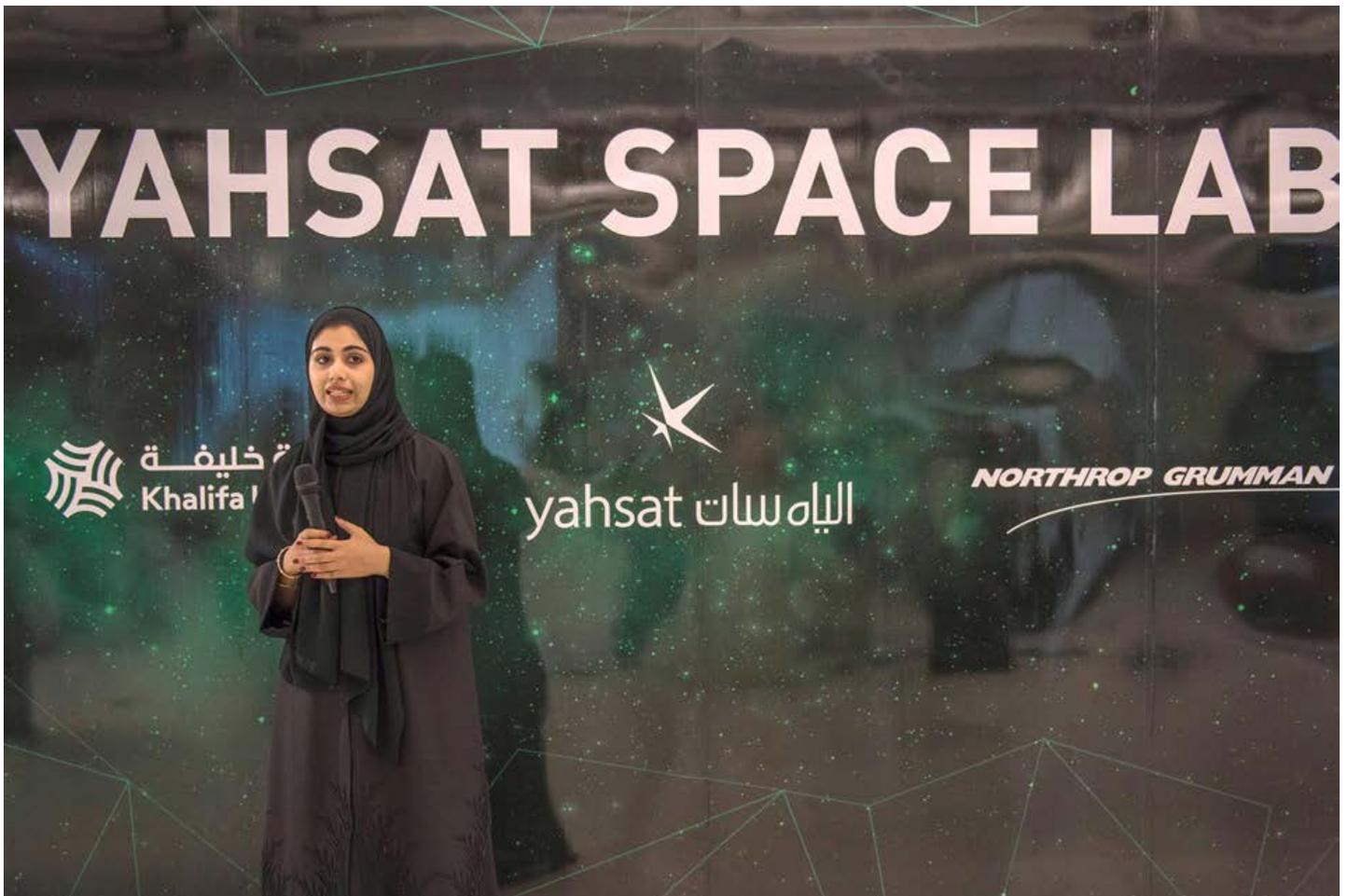
Grumman Cygnus spacecraft. The launch took place at the Wallops Flight Facility in Virginia, USA and was attended by a group of Khalifa University students and faculty who have participated in the development of the Nano satellite. Developed in the Yahsat Space Lab by the students of Khalifa University of Science and Technology, the miniature satellite (also known as a CubeSat) will be used for educational and research purposes once it is deployed

to its final orbit in the beginning of 2019. The Nano satellite carries two payloads, including a camera to take images of the UAE from space, demonstrating the process of remote sensing, as well as an innovative lithium-ion battery developed at Khalifa University to be tested in the extreme temperatures and radiation in space. Dr. Arif Sultan Al Hammadi, executive vice president, Khalifa University of Science and Technology, said, "The

successful launch of MYSAT-1, developed and built by students of Khalifa University's Master's Concentration in Space Systems and Technology, demonstrates that our university possesses the academic and scientific rigor required to transform the UAE's promising students into tomorrow's space engineers and scientists. Through our Small Satellite Program and the Master's Concentration, Khalifa University is proud to play a critical role in the UAE's broader space ambitions. We will continue to develop local talent that will be part of the Emirati space engineers and scientists who will contribute to the UAE's Hope Mars Mission and the vibrancy of the country's overall space sector." Muna AlMheiri, chief human capital officer, Yahsat said, "MYSAT-1's expedition into space marks

an exciting accomplishment by the students of Khalifa University. It is also a testimony to the UAE's growing talent pool in STEM education. Yahsat is proud to have collaborated with Khalifa University and Northrop Grumman to create the first multi-disciplinary academic space program in the UAE which has resulted in the creation and successful launch of MYSAT-1. We are committed to developing the national talent pool through providing talent with unique opportunities to enhance their capabilities and drive innovation." The launch of MYSAT-1 to ISS follows the rigorous testing of the Nano satellite's engineering model for space environment conditions as well as the integration of the final launch satellite to NanoRacks' external Cygnus CubeSat

deployer. The Cygnus is an automated cargo resupply spacecraft destined for the International Space Station. MYSAT-1 is the first Cubesat (or Nano satellite) built at the Yahsat Space Lab at Khalifa University. The laboratory was launched in 2017 at Masdar Institute in collaboration with Yahsat and Orbital ATK – part of Northrop Grumman– to develop and advance technologies within the space sector in line with the UAE's space ambitions. It is the first space systems lab in the UAE to be equipped with Assembly Integration and Verification (AIV) facilities that cater to CubeSats of up to 6U in size (12kg 12x24x36cm) and a mass up to 10 kg. The lab also has a VHF/UHF/S-Band ground station capable of autonomous operations. 





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ARTICLE

Taxation in the Digitalized Economy – Challenges and What Countries are Doing About It

Digitalization of our economic activities and pervasive new technologies have been and are a key driver of change and bring significant benefits and opportunities. They are also disrupting the world as we know it, and have a profound reach into everyday life. They affect how we live, work, communicate and interact,

Governments are increasingly concerned with tax revenue losses arising from multinational tax planning by MNEs that result in base erosion and profit shifting (BEPS) and other, broader tax challenges and local distortions. Tax revenue losses resulting from BEPS have been conservatively estimated by the OECD to amount to US\$100-240 billion per annum globally.

connect, consume and produce, how we create knowledge, how we function and act as a society, and so much more. According to CISCO, the global internet community consisted of 3 billion users in 2015, with 16.3 billion devices connected to the internet globally, which CISCO expects to increase to 4.1 billion users and 26.3 billion devices by 2020. New businesses are created that range from being entirely digital, relying on intangible assets and user participation, no longer requiring physical assets such as offices or sales outlets or large numbers of employees, to businesses that have digitalized some of their aspects and functions. For example, Airbnb, the world's largest accommodation provider, owns no real estate and Uber, the world's largest taxi company, owns no vehicles. Alibaba, the most valuable retailer, has no inventory, and Facebook, the world's most popular media owner, creates no content. While we used to look at these companies and their activities as distinct from traditional and domestic businesses and economic activities, it is increasingly difficult to do so. This is particularly so for taxation purposes. The OECD in its 2015 Action 1 Report acknowledges that it would be difficult, if not impossible, to 'ring-fence' the digital economy from the rest of the economy for tax purposes because of the increasingly pervasive nature of digitalization. Instead, it considers "digitalization as



Imme Philbeck

Chief Economist and Director Sector Development
SAMENA Telecommunications Council



a transformative process affecting all sectors brought by advances in ICT". Thereby the "digital economy" is becoming the economy itself.

In this context of convergence, governments are increasingly concerned with tax revenue losses arising from multinational tax planning by MNEs that result in base erosion and profit shifting (BEPS) and other, broader tax challenges. Tax revenue losses resulting from BEPS have been conservatively estimated by the OECD to amount to US\$100-240 billion per annum globally. BEPS is not a new problem – MNEs have always pursued tax minimization strategies – but certain features of the digitalized economy exacerbate the issues. These features have created a mismatch or disconnect between where profits are made, taxes are paid and where value is created. Also, this mismatch has repercussions at the local level, and can lead to distortions along the digital value chain and across different economic sectors. Therefore, the international community such as the OECD and leading jurisdictions such as the EU are examining how the international tax framework is being challenged by changes in how global businesses are managed and structured and are undertaking efforts to identify – for the long term – how the international taxation framework can be adjusted to cater better to an increasingly digitalized world. In the short term pending an international solution, individual countries are moving unilaterally, such as the UK, India or Slovakia, but also the EU, putting forward and implementing proposals to ensure that digital businesses pay tax that reflects the value they derive from users located in consumption countries. Such measures include digital services taxes, digital transaction taxes, digital platform taxes, equalization levies and changes to concepts of permanent physical establishment.

The article briefly examines the key features of the digitalized economy and the key issues that arise from them for taxation under current international tax rules, their repercussions at the local level, and summarizes what countries are doing to address the issues identified.

Features of the Digitalized Economy and the International Tax Framework

The way in which businesses carry out their global activities has been fundamentally changed by digitalization and technological advancement. With borderless digital infrastructures, such as the Internet, new business models have emerged that facilitate the creation of global digital companies that are much more flexible and have instant global reach. These digital companies create economic value by relying on platform economics (e.g. network effects, economies of scale and market power), intangible assets and user-generated data, with suppliers, consumers and marketplaces often located in different tax jurisdictions. Where once companies had a physical establishment in the country of consumption, digital companies / platforms now have greater flexibility over where they locate their business activities with the ability of connecting employees in different countries through their online platforms and accessing different geographic markets with ease from a limited number of remote locations, without the need for a material local presence. Moreover, for many digital businesses that operate in markets through an online platform, the users of the platform (which may or may not be identical to a business's consumers) play a more integral role in the pursuit of revenue and create material value for a business through their sustained engagement and active participation. In addition, new multi-sided business models have emerged that are far more flexible and allow for much greater reach. These business models used by e.g. over-the-top businesses enable much easier connection of geographically distinct user groups to maximize value on each side, where for example, resources designed to collect data can be located near individual users, whereas the infrastructure necessary to sell this data to paying customers can be located elsewhere.

The OECD within its Base Erosion and Profit Shifting Project ("BEPS") has identified several key features of the digitalized economy that are potentially relevant from a tax perspective. These include mobility, reliance on data, network effects, use of multi-sided business models, tendency towards monopoly

or oligopoly and volatility. Mobility has significantly increased as it relates to intangible, users and customers, as well as business functions. Digital companies rely on and invest heavily in the exploitation and development of intangibles (e.g. software), which are a core contributor to value creation and economic growth. The OECD Report 2015 finds that under existing tax rules, the rights to those intangibles can often be easily assigned and transferred among associated enterprises, with the result that the legal ownership of the assets may be separated from the activities that resulted in the development of those assets. In addition, digital companies also serve a much more mobile user- and customer base than traditional businesses.

The OECD within its Base Erosion and Profit Shifting Project ("BEPS") has identified several key features of the digitalized economy that are potentially relevant from a tax perspective. These include mobility, reliance on data, network effects, use of multi-sided business models, tendency towards monopoly or oligopoly and volatility.

The mobility of users and customers relates to users' ability to purchase services in one location and consume these services in other locations, when e.g. travelling. In a digitalized economy, where the location of a user may be concealed, difficulties can arise to determine the location of an ultimate sale which has repercussions for e.g. VAT collection. Moreover, entire business functions can easily be managed over long distances from one central location and with a minimum need of personnel present, where operations are carried out in one location and suppliers and customers are located in another location, enabled through improved telecommunications, information management software, and

personal computing. This has improved the capacity of businesses to manage their global operations on an integrated basis and adopt global business models that centralize functions at a regional or global level, rather than at a country-by-country level. This enables individual group companies to exercise their functions within a framework of group policies and strategies set by the group as a whole and monitored centrally. This way, companies can achieve “scale without mass”, which has also enabled SMEs to become “micro-multinationals” that operate and have personnel in multiple countries and continents.

Digital companies also heavily rely on user generated data and user participation in their value creation. This has been facilitated by an increase in computing power and storage capacity and a decrease in data storage cost. This, in turn, has greatly increased the ability to collect, store, and analyze “big data” at a greater distance and in greater quantities. Whereas companies have always relied on data regarding customer preferences to improve products and services, the scale and complexity of data collection, storage and processing is exponentially greater in the digitalized economy. The OECD 2015 report highlights that traditional data collection for utility companies was limited to yearly measurement, coupled with random samplings throughout the year. With smart metering on the other hand, the measurement rate could be increased to 15 minute samples, which would equate to a 35 000 time increase in the amount of data collected. This capacity to collect and analyze data will continue to rapidly increase as the number of sensors embedded in devices that are networked to computing resources increases.

Network effects are also a key component of new digital business models as they relate to user participation, integration and synergies: a product or service gains additional value as more people use it, e.g. social networking, instant messaging, chat services, or a widely-adopted operating system and corresponding software written for it, resulting in a better user experience. Network effects are positive externalities, where the welfare of a person is improved by the actions of other persons, without explicit compensation. Leveraging these network effects, multi-sided business models have emerged as another key feature of the digitalized economy, in which the two sides of the market may be in different jurisdictions. A multi-sided business model is based on a market in which multiple distinct groups of persons interact through an intermediary or platform, and the decisions of each group of persons affects the outcome for the other groups of persons through a positive or negative externality. In a multi-sided business model, the prices charged to the members of each group reflect the effects of these externalities. If the activities of one side create a positive externality for another side (e.g. more clicks by users on links sponsored by advertisers), then the prices to that other side can be increased.

INFOBOX on BEPS – what does it mean, and why it is relevant to the debate?

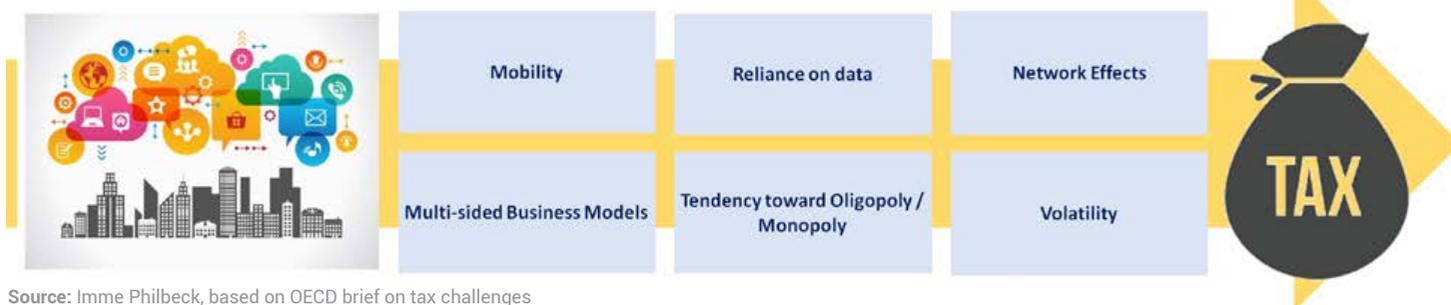
Base erosion and profit shifting concerns (BEPS) are raised by situations in which taxable income can be artificially segregated from the activities that generate it, or in the case of VAT, situations in which no or an inappropriately low amount of tax is collected on remote digital supplies to exempt businesses or multi-location enterprises that are engaged in exempt activities. These situations undermine the integrity of the tax system and potentially increase the difficulty of reaching revenue goals. In addition, when certain taxpayers are able to shift taxable income away from the jurisdiction in which income producing activities are conducted, other taxpayers may ultimately bear a greater share of the burden. BEPS activities also distort competition, as corporations operating only in domestic markets or refraining from BEPS activities may face a competitive disadvantage relative to MNEs that are able to avoid or reduce tax by shifting their profits across borders.

The February 2013 OECD report “Addressing Base Erosion and Profit Shifting” (February BEPS Report) identifies a number of coordinated strategies associated with BEPS in the context of direct taxation, which can often be broken down into four elements:

- **Minimization of taxation in the market country** by avoiding a taxable presence, or in the case of a taxable presence, either by shifting gross profits via trading structures or by reducing net profit by maximizing deductions at the level of the payer;
- **Low or no withholding tax at source;**
- **Low or no taxation at the level of the recipient** (which can be achieved via low-tax jurisdictions, preferential regimes, or hybrid mismatch arrangements) with entitlement to substantial non-routine profits often built-up via intra-group arrangements; and
- **No current taxation** of the low-tax profits at the level of the ultimate parent.

BEPS is relevant in the context of a digitalized economy, as certain features of the digitalized economy exacerbate the issues of BEPS and create other, broader tax challenges.

Figure 1: Key Features of Digitalization potentially relevant for taxation



Source: Imme Philbeck, based on OECD brief on tax challenges

<https://www.oecd.org/tax/beps/brief-on-the-tax-challenges-arising-from-digitalisation-interim-report-2018.pdf>

It should be noted that multi-sided business models are more prevalent in a cross-border context and feature two specific characteristics: flexibility and reach. Digital businesses are able to flexibly use resources (content, user data, executable code), that don't expire due to their ability to be stored. These resources can create value for a company long after they have been produced and can be dynamically adapted based on evolving technology. They can also be used to enhance the value to one side of a market of the participation of the other side of the market. Moreover, digital businesses such as over-the-top platforms have much greater reach through the ability to more easily connect two sides that are located far from one another to maximize value on each side.

Taken together, the OECD 2015 Report finds that the prevalence of network effects and multi-sided business models that are often cross-border, coupled with reliance on intangible assets such as IP have a tendency toward creating monopolistic or oligopolistic structures. Where network effects are combined with low incremental costs, a company can quickly achieve a dominant position. The effect is exacerbated, where a company holds a patent or other intellectual property rights, so that it can seamlessly innovate. The OECD highlights that the impact of these network effects tends to lead to such structures, for example, where companies provide a platform or market in which users on one side of the market prefer to use only a single provider, so that value to those users is enhanced when a single standard is chosen, and the price that can be charged to the other side is enhanced because the platform becomes the only means of access to those users. Moreover, given low barriers to entry for Internet-based businesses due to progress in miniaturization and a downward trend in the cost of computing power, coupled with rapid technological development, digital markets can be volatile. While volatility could provide a check on monopolistic structures, it is strategically counteracted by long-term successful digital companies through vertical and horizontal integration and acquisition of start-ups with innovative ideas (e.g. Facebook, who bought WhatsApp and Instagram to complement

its social networking site). This enables digital companies to stay relevant, launching new features and new products, and continually evaluating and modifying business models in order to leverage their market position and maintain dominance in the market. Figure 2 shows the Web World and Who owns Who.

These new features of mobility, reliance on data, network effects, use of multi-sided business models, tendency towards monopoly or oligopoly and volatility as described above, are said to enable economic actors to operate in ways that avoid, remove, or significantly reduce, their tax liability within traditional tax bases. They may also generate base erosion and profit shifting concerns in relation to both direct and indirect taxes. The OECD 2015 Report states, for example, that the importance of intangibles in the context of the digitalized economy, combined with the mobility of intangibles for tax purposes under existing tax rules, may generate substantial base erosion and profit shifting opportunities in the area of direct taxes. It also highlights

that the mobility of users may create substantial challenges and risks in the context of the imposition of value added tax (VAT). Furthermore, the ability to centralize infrastructure at a distance from a market jurisdiction and conduct substantial sales into that market from a remote location, combined with the increasing ability to conduct substantial activity with minimal use of personnel, may generate potential opportunities to achieve base erosion and profit shifting by fragmenting physical operations to avoid taxation.

So, in how far do these features affect taxation? Why do these features create issues with current international tax rules and make governments worry about losing corporate tax revenue, collecting VAT, or broader issues such as their effect on local competition or the creation of asymmetries vis-à-vis other economic sectors? To understand why the features as identified above create problems for the current international tax framework, we need to understand what the international tax framework is based on and designed to do.

Figure 2: The Web World and Who owns Who 2018



Source: <http://uk.businessinsider.com/big-tech-companies-buying-smaller-startups-2018-3?r=US&IR=T>

Key Issues at the heart of the Digital Tax Debate

Cross-border taxation issues are regulated using domestic tax law, tax treaties and other international law instruments, such as international tax rules and standards. Whilst the classic example is a tax treaty that resolves double-taxation issues, there are also rules and standards relating to matters such as transfer pricing, dispute resolution mechanisms and tax information exchange. The OECD's Model Tax Convention on Income and on Capital serves as a basis for more than 3500 bilateral tax treaties, along with the United Nations Model Double Taxation Convention between Developed and Developing Countries. The OECD has also developed Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations. Furthermore, the Global Forum on Transparency and Exchange of Information for Tax Purposes (Global Forum) is a framework where OECD and non-OECD member jurisdictions are working together to promote standards in the international exchange of tax information between tax administration bodies.

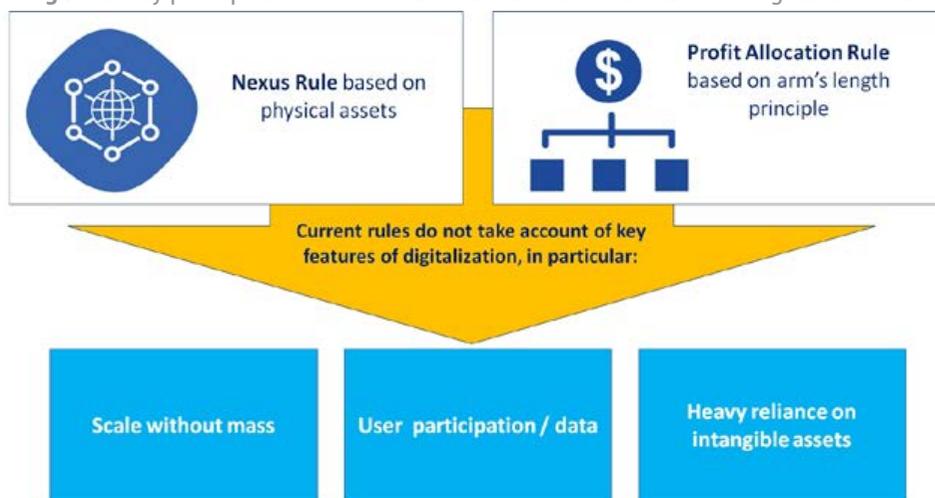
The current international tax framework was developed in the 1920s and determines how business profits from cross-border activities are taxed. It allocates taxing rights based on the location of physical assets, capital and labour, the source of income and the residence of taxpayers. It is based on two key concepts, namely (1) the nexus rule to determine jurisdiction to tax a non-resident enterprise and, (2) the profit allocation rule, based on the arm's length principle. It does not take

account of the extent to which businesses have become globalized and digitalized. Because digitalization and its new business models have created a mismatch between where profits are made and where value is created, questions are arising with regards to the relevance and effectiveness of these two key concepts. To examine the question of why the two key concepts of nexus and profit allocation may no longer hold in the digitalized economy, we need to first understand how highly digitalized businesses are taxed. In most jurisdictions, highly digitalized companies are normally subject to the market country's domestic tax framework, just like traditional businesses operating in the consumption country. Their consumption country sourced profits will be subject to the consumption country's domestic income tax, and the goods and services consumed by the consumption country's consumers will generally be subject to VAT. However, problems arise because many foreign-based, highly digitalized companies have relatively small consumption country sourced profits, because the majority of their profit-generating assets and labour are located outside the consumption country. Moreover, the development of new digital products or means of delivering services creates uncertainties in relation to the proper characterization of payments made in the context of new business models, particularly in relation to cloud computing. Also, companies gather and use information across borders to an unprecedented degree, which raises the issues of how to attribute value created from the generation of data through digital products and services, and of how

to characterize for tax purposes a person or entity's supply of data in a transaction (e.g., as a free supply of a good, as a barter transaction, or in some other way). Further, the fact that users of a participative networked platform contribute user-generated content, with the result that the value of the platform to existing users is enhanced as new users join and contribute, may raise other challenges.

As identified above, a common characteristic of most digital businesses is the ability to access a market via technological means without necessarily having a physical presence or a significant number of employees in that market, i.e. they have the ability to achieve "scale without mass". Because the current international tax framework relies on nexus based on physical assets, a mismatch is created between "consumption" and "production" countries, as profits are taxed where digital companies hold their physical assets, but not where they generate most of their value through e.g. user participation and data generated through digital services and products. Moreover, digital businesses often rely heavily on highly mobile, intangible assets. These assets, such as algorithms, can be located anywhere in the world, and usually only require a network to be established for them to be accessed. As a result, a digital business may have a significant economic presence in one jurisdiction, while the majority of its profit-generating assets and labour can be located in a different jurisdiction. In this way, under the international tax framework and the consumption country's corporate income tax systems, only a relatively small amount of the global profits of a highly digitalized multinational company may be sourced in the consumption country. It should be noted that a multinational enterprise's capacity to have a significant economic presence in the consumption country, but pay a small amount of tax there is not a new challenge. For decades, foreign businesses in a range of sectors of the traditional economy have operated business models where the majority of profit-generating assets and labour have been located offshore. However, increasing digitalization and increasingly mobile intangible assets intensify this challenge, particularly in sectors of the economy most affected by digital disruption.

Figure 3: Key principles of the International Tax Framework and its "digital" shortfalls



Source: Imme Philbeck

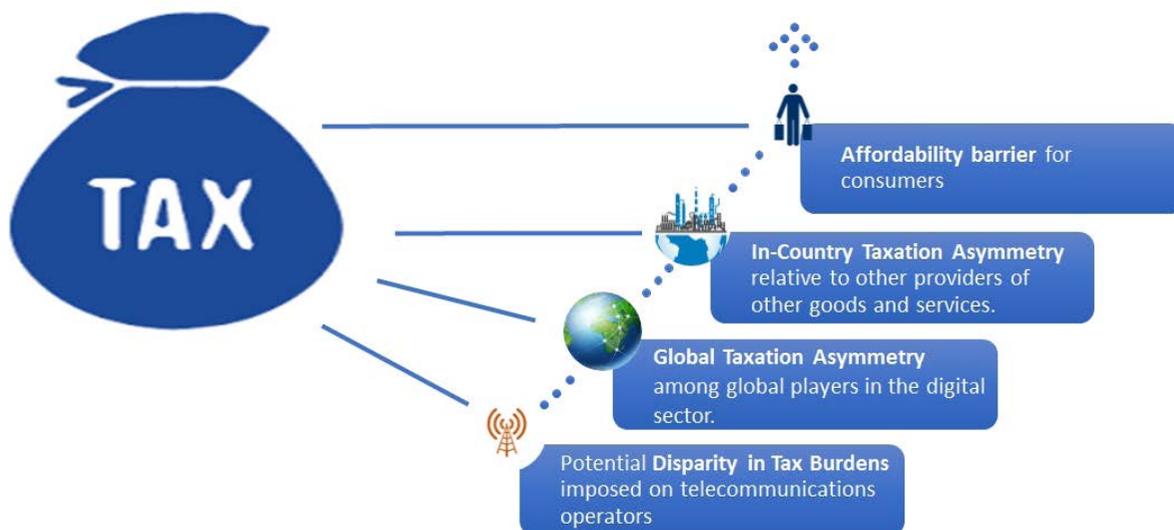
Challenges for tax policy makers

Taxation is essentially about managing the interests of governments, industry stakeholders and consumers, which often lie at opposite ends of the spectrum: governments need to ensure that they have enough revenue to finance their expenditures for public services; businesses need to make sure they are incentivized and have sufficient funds available for investment, and consumers

“residence” countries are managed in a neutrally balanced manner. Ensuring this principle in the digital economy, however, is a lot more complex than it used to be in the analogue world and has created new and more systemic challenges for tax policymakers and tax administrators. As a first step, however, the international tax framework must be in line with domestic corporate income tax systems, which should reflect the changed way of doing

tax mix. For decades, companies have contributed to public expenses via a broad range of taxes in addition to corporate income tax. These taxes include employment taxes, environmental taxes, property and land taxes. These fall to the wayside, with less businesses requiring physical presence and serving markets from remote locations. This, in turn, may increase the pressure on a smaller number of taxpayers to compensate for the related

Figure 4: Distortive Effects of taxes in the Digital Ecosystem



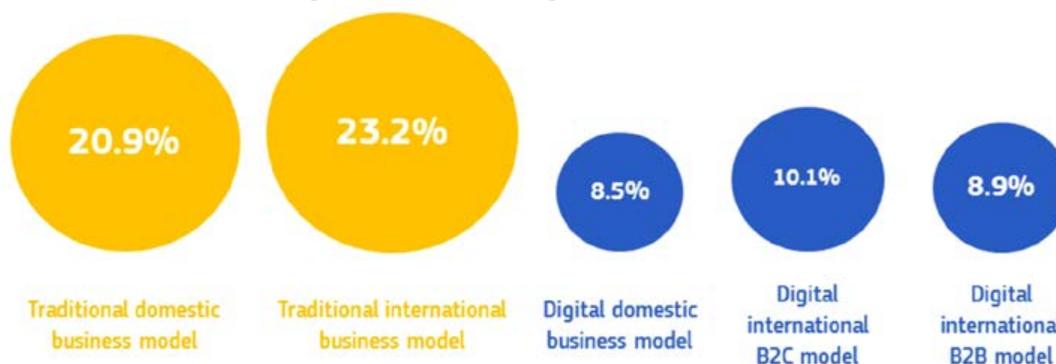
must have enough income to consume. It is therefore essential to understand what the implications are from addressing those interests through taxation. Taxes can bring these interests into imbalance when they affect the choices of stakeholders made over and above what would happen in the absence of them. Therefore, in principle, taxation should attempt to be neutral and equitable across all sectors of the economy. At the global level, this principle should also hold and it should be ensured that the interests of “consumption” and

business based on the new features of the digitalized economy, to avoid distortive effects at the local and global levels. Figure 4 shows the distortive effects that can arise when tax effects are not neutral and when the international tax framework and domestic tax systems are not aligned.

The OECD Interim Report 2018 finds that from a strategic tax policy perspective the uptake of digital technologies may potentially constrain the options available to policymakers in relation to the overall

loss of revenues, e.g. increases of taxes and fees imposed on the telecommunications sector vis-à-vis other economic sectors to bridge the revenue gap. This can negatively impact investment incentives and uptake through increased costs. A study by the European Commission found that the average effective tax rate for tech businesses was only between 8.5%-10.1% – less than half of the 23.2% for traditional businesses.

Figure 5: Effective average tax rate in EU 28



Source: Digital Tax Index, 2017, PWC and ZEW

What individual countries and supranational organizations and different jurisdictions are doing

To address the high-level tax challenges relating to the international tax framework, the OECD and the EU have been working to drive the development of an international solution to digital economy taxation issues, with the focus on “nexus” (namely, addressing the disconnect between tax jurisdiction and the location of value creation by expanding the definition of PE to encompass “digital presence” as determined by the location of a service’s users), and reallocating profits (namely, reallocating taxing rights among the “countries of residence”, the tax havens, and the “countries of consumption” by modifying the formulas for allocating taxable income with the users’ contribution in mind (boosting the share taxable by the countries of consumption)).

Individual countries do not want to wait, pending globally agreed solutions, and are moving forward with short-term gap-stop measures, including the UK, Australia, France, Italy, Slovakia, India, and many others. Australia is currently consulting on its corporate tax system in the context of the digital economy and is specifically consulting on the questions whether taxing rights should change to reflect user-created value and value associated with intangibles; whether existing profit attribution rules should be changed; whether existing nexus rules for determining which countries have the right to tax foreign resident companies should be changed; and lastly, whether changes can only apply to highly digitalized businesses. The consultation closes on 30 November 2018. While the UK government remains committed to reform of the international corporate tax framework for digital businesses, pending global reform, it is undertaking interim action, to ensure that digital businesses pay tax that reflects the value they derive from UK users. The UK government has therefore announced that it will introduce a Digital Services Tax (DST) from April 2020, which is estimated to raise £1.5 billion over four years. French President Emmanuel Macron proposed a new tax on internet companies in April 2018, although without providing any detail. Other examples of unilateral action include Italy, which established a 3% web tax on digital transactions, effective January 1, 2019; Slovakia, which amended its income tax in January 2018 to add a tax on providers of services on digital platforms; Hungary, which proposed an internet tax in October 2017; and India, which introduced an equalization levy on online advertising revenue in 2016 and a revised permanent establishment concept in 2018.

Spotlight: United Kingdom's introduction of a Digital Services Tax as an Interim Measure

(Source: UK HM Treasury Digital Services Tax fact sheet)

The UK government, pending international efforts, decided to introduce a Digital Service Tax to ensure that the corporate tax system is sustainable and fair across different types of businesses, i.e. that digital businesses pay tax that reflects the value they derive from UK users. The tax will come into effect in April 2020 and will apply only to digital businesses that are profitable and generate at least £500 million a year in global revenues.

- The development of the digital economy has brought significant benefits to all of us, but poses a challenge for the international corporate tax system. The government has set out these challenges in two position papers, published at Autumn Budget 2017, and Spring Statement 2018. They explain the need to reform international tax rules to ensure they reflect the value users create for digital businesses.
- While the government believes that the long-term answer to these challenges is reform of the global tax system – and has been pushing for that to happen internationally – the outcome of that process remains uncertain.
- As a result, the government has decided to act now and will introduce a Digital Services Tax (DST) from April 2020. The DST will raise £1.5 billion over four years and ensure digital businesses pay tax in the UK that reflects the value they derive from UK users.
- The government will continue to lead efforts with its partners in the EU, G20 and OECD to reach international agreement on future reforms to the international corporate tax framework, and will dis-apply the DST when an appropriate international solution is in place.

How will the tax work?

- The DST applies a 2% tax on the revenues of specific digital business models where their revenues are linked the participation of UK users. The tax will apply to: search engines; social media platforms; and online marketplaces. That is because the government considers these business models derive significant value from the participation of their users.
- The DST is not a tax on online sales of goods – as a result it will only apply to revenues earned from intermediating such sales, not from making the online sale.
- It is also not a generalised tax on online advertising or the collection of data. Businesses will only be taxed on the revenues derived from these services to the extent they are performing one of the in-scope business models, which are the provision of a search engine, social media platform or online marketplace.
- The DST will apply to the revenues that are attributable to in-scope business models whenever they are linked to UK users. This means that, for the purposes of the DST, what matters is the location of the user, not the business. For example:
 - if a social media platform generates revenues from targeting adverts at UK users, the government will apply a 2% tax to those revenues
 - if a marketplace generates commission by facilitating a transaction between UK users, the government will apply a 2% tax to those revenues
 - if a search engine generates revenues from displaying advertising against the result of key search terms inputted by UK users, the government will apply a 2% tax to those revenues

- The DST is intended to be narrowly-targeted, proportionate and ultimately temporary, pending a comprehensive global solution. As such it includes the following features:
 - » **A double threshold** – this means businesses will need to generate revenues from in-scope business models of at least £500m globally to become taxable under the DST. The first £25m of relevant UK revenues are also not taxable. This means that small businesses will not be in scope of the tax.
 - » **A safe harbour** – this means that businesses can elect to calculate their liability on alternative basis, which will be of benefit to those with very low profit margins. The outcome is that those making losses under this calculation will not have to pay the DST and those with very low profit margins will pay a reduced rate of tax. The government will be consulting on the precise design of the safe harbour which is intended to ensure the DST is proportionate.
 - » **A review clause** – this means that the DST will be subject to formal review in 2025 to ensure it is still required following further international discussions. This underlines the government’s commitment to continue seeking a global solution to ultimately replace

- the DST. In addition, the government will dis-apply the DST if an appropriate international solution is in place prior to 2025.
- The DST will be an allowable expense for UK Corporate Tax purposes under ordinary principles. However, given the DST will not be within the scope of the UK’s double tax treaties, it will not be creditable against UK Corporate Tax.
- Financial and payment services, the provision of online content, sales of software/hardware and television/broadcasting services will not be in scope of the DST. The government will explore with stakeholders during the consultation whether further exemptions should be made.

Next steps

- The government will be issuing a consultation on the design of the DST in the coming weeks. It intends to use this consultation to explore the key questions and challenges concerning the application of the DST, ensure it operates as intended and that it does not place unreasonable burdens on businesses. The DST will then be legislated for in the 2019/2020 Finance Bill, and apply from April 2020.

Scorecard Year/ Yield (£m)	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
	N/A	+5	+275	+370	+400	+440

The OECD

In June 2012, more than 110 countries and jurisdictions came together to deal with these and other international tax issues within the OECD/G20 Base Erosion and Profit Shifting (BEPS) project. The OECD-G20 BEPS project aimed to respond to identified weaknesses in the international tax framework which were frustrating the principle of aligning profits with value creation and creating opportunities for multinational groups to break that alignment through artificial structures. The process produced a series of multilaterally agreed recommendations and best practice approaches. This included steps to protect the definition of a permanent establishment against avoidance, act against groups shifting

taxable profits overseas through interest payments and revise the transfer pricing guidelines to put greater emphasis on real economic activities in determining how profits are allocated between countries. The BEPS project’s “final report,” released in the fall of 2015, fell short of a concrete agreement on measures to address the tax challenges of the digital economy. Since then, talks have continued under the OECD/G20 Inclusive Framework on BEPS, with the goal of issuing another final report in 2020.

The Inclusive Framework’s interim report, “Tax Challenges Arising from Digitalization,” was released in mid-March 2018 and presented to the G20 finance ministers and central bank governors

at their March 19–20 2018 meeting. While none of the fundamental long-term taxation solutions advocated by the “countries of consumption” found their way into the report, the members did agree to review the “nexus” and “profit allocation” rules for determining tax jurisdiction and assigning business income, raising hopes of a decision that would substantially broaden the definition of PE and facilitate the taxation of business profits where they are generated. It was also agreed that any indirect taxes on digital services imposed by individual jurisdictions in the interim should be compliant with existing tax treaties and the rules of the World Trade Organization.

Spotlight: OECD Base Erosion and Profit Shifting (BEPS) Project, BEPS Package, BEPS Package implementation, the Inclusive Framework on BEPS, Interim Report

(See: <http://www.oecd.org/tax/beps/beps-about.htm>)

Background: With political support of G20 Leaders, the international community has taken joint action to increase transparency and exchange of information in tax matters, and to

address weaknesses of the international tax system that create opportunities for BEPS. The internationally agreed standards of transparency and exchange of information in the tax area have put an end to the era of bank secrecy. With over 130 countries and jurisdictions currently participating, the Global Forum on Transparency and Exchange of Information for Tax Purposes has ensured consistent and effective implementation of international transparency standards since its establishment in 2009. At the same time, the financial crisis and aggressive tax planning by multinational enterprises (MNEs) have put BEPS

high on the political agenda. **With a conservatively estimated annual revenue loss of USD 100 to 240 billion**, the stakes are high for governments around the world. The impact of BEPS on developing countries, as a percentage of tax revenues, is estimated to be even higher than in developed countries.

Development of a comprehensive Action Plan: In September 2013, the G20 Leaders endorsed the ambitious and comprehensive BEPS Action Plan, developed with OECD members. On the basis of this Action Plan, the OECD and G20 countries developed and agreed, on an equal footing, upon a comprehensive package of measures in just two years. These measures were designed to be implemented domestically and through tax treaty provisions in a co-ordinated manner, supported by targeted monitoring and strengthened transparency.

The BEPS Package: *The BEPS package provides 15 Actions that equip governments with the **domestic and international instruments** needed to tackle BEPS. Countries now have the tools to ensure that profits are taxed where economic activities generating the profits are performed and where value is created. These tools also give businesses greater certainty by reducing disputes over the application of international tax rules and standardising compliance requirements.*

- The BEPS package consists of reports on 15 actions, and sets out a variety of measures ranging from new minimum standards, the revision of existing standards, as well as common approaches which will facilitate the convergence of national practices, and guidance drawing on best practices.
- In particular, four minimum standards were agreed, to tackle issues in cases where no action by some countries or jurisdictions would have created negative spill overs (including adverse impacts of competitiveness) on others. Their consistent implementation will allow countries to protect their taxable base. Existing standards have also been updated and will be implemented, noting however that not all countries that have participated in the BEPS Project have endorsed the underlying standards on tax treaties or transfer pricing.
- In other areas, such as recommendations on hybrid mismatch arrangements and best practices on interest deductibility, countries and jurisdictions have agreed a general tax policy direction. In these areas, domestic rules are expected to converge through the implementation of the agreed common approaches, thereby still enabling further consideration of whether such measures should become minimum standards. Guidance based on best practices will also support governments intending to act in the areas of mandatory disclosure initiatives or controlled foreign company (CFC) legislation.

Implementing the BEPS Package: *The BEPS package was agreed and delivered by OECD members and by G20 economies, and subsequently endorsed by the G20 Leaders Summit in Antalya on 15-16 November 2015. Effective and consistent implementation of the BEPS package requires an inclusive*

implementation process.

- First, the implementation of the BEPS package into different tax systems should not result in conflicts between domestic systems. Furthermore, the interpretation of the new standards should not lead to increased disputes.
- Finally, it is necessary to ensure a level playing field among countries and jurisdictions in the fight against tax avoidance. Jurisdictions identified as relevant to the work of the Global Forum on Transparency and Information Exchange for Tax Purposes (Global Forum) have already been subject to monitoring and peer review of the implementation of the Global Forum's standards on transparency and the exchange of information for tax purposes. A similar process is being developed for the implementation of the BEPS package.
- Inclusiveness also means that the implementation process is open to interested countries and jurisdictions. Therefore, the G20 Leaders called in their Communique from November 2015 on the OECD to develop a framework which is open to all interested countries and jurisdictions, including developing countries: "...We, therefore, strongly urge the timely implementation of the project and encourage all countries and jurisdictions, including developing ones, to participate. To monitor the implementation of the BEPS project globally, we call on the OECD to develop an inclusive framework by early 2016 with the involvement of interested non-G20 countries and jurisdictions which commit to implement the BEPS project, including developing economies, on an equal footing."

The Inclusive Framework on BEPS: *The **Inclusive Framework on BEPS** brings together over 115 countries and jurisdictions to collaborate on the implementation of the OECD/ G20 Base Erosion and Profit Shifting (BEPS) Package.*

- In response to the call of the G20 Leaders, the OECD members and G20 countries have developed an Inclusive Framework which allows interested countries and jurisdictions to work with OECD and G20 members on developing standards on BEPS related issues, and to review and monitor the implementation of the whole BEPS package.
- To join the framework countries and jurisdictions are required to commit to the comprehensive BEPS package and its consistent implementation and to pay an annual BEPS Member fee (reduced when applied to developing countries). However, it is recognized that interested developing countries' timing of implementation may differ from that of other countries and jurisdictions, and that their circumstances should be appropriately addressed in the framework. With a strong political support, the Inclusive Framework is now in place.
- The first meeting of the Inclusive Framework on BEPS was held on 30 June – 1 July 2016 in Kyoto, Japan, and the second one on 26 - 27 January 2017 in Paris, France. To date, 48 countries and jurisdictions have joined the Inclusive Framework with the existing group of 46 countries (including OECD, OECD accession and G20 members), making the total

number of countries and jurisdictions participating 94.

- International organisations and regional tax organisations also play an important role in the Inclusive Framework on BEPS, in particular to support the implementation of the BEPS package in developing countries. The African Tax Administration Forum (ATAF), the Centre de rencontres et d'études des dirigeants des administrations fiscales (CREDAF), the Centro Interamericano de Administraciones Tributarias (CIAT) together with other international organisations such as the International Monetary Fund (IMF), the World Bank (WB) and the United Nations (UN) participate in the BEPS work as observers. Furthermore, the IMF, the OECD, the UN and the WBG intensified their co-operation on a wide range of international tax issues through the Platform for Collaboration on Tax, which has been established in April 2016.

Interim Report March 2018: *On March 16, 2018, the OECD published its interim report regarding taxation of the digital economy under the title "Tax Challenges Arising from Digitalization". The OECD interim report, which is the result of a consensus reached between more than 110 member countries, presents an in-depth analysis of the different digital business models and how they create value.*

- The challenges of the digitalisation of the economy were identified as one of the main focuses of the Base Erosion and Profit Shifting (BEPS) Action Plan leading to the 2015 BEPS Action 1 Report. In March 2017, the G20 Finance Ministers mandated the OECD, through the Inclusive Framework on BEPS, to deliver an interim report on the implications of digitalisation for taxation by April 2018. This report, Tax Challenges Arising from Digitalisation – Interim Report 2018 (the Interim Report) has now been agreed by the more than 110 members of the Inclusive Framework.
- The Interim Report provides an in-depth analysis of the main features frequently observed in certain highly digitalised business models and value creation in the digitalised age, as well as the potential implications for the existing international tax framework. It describes the complexities of the issues involved, the positions that different countries have in regard to these features and their implications, and which drive their approach to possible solutions. These different approaches towards a long term solution range from those countries that consider no action is needed, to those that consider there is a need for action that would take into account user contributions, through to others who consider that any changes should apply to the economy more broadly.
- Members agreed to undertake a coherent and concurrent review of the "nexus" and "profit allocation" rules – fundamental concepts relating to the allocation of taxing rights between jurisdictions and the determination of the relevant share of the multinational enterprise's profits that will be subject to taxation in a given jurisdiction. They will

work towards a consensus-based solution, noting that at present, there are divergent views on how the issue should be approached. It was agreed that the Inclusive Framework would carry out this work with the goal of producing a final report in 2020, with an update to the G20 in 2019. The Inclusive Framework's Task Force on the Digital Economy will meet next in July 2018.

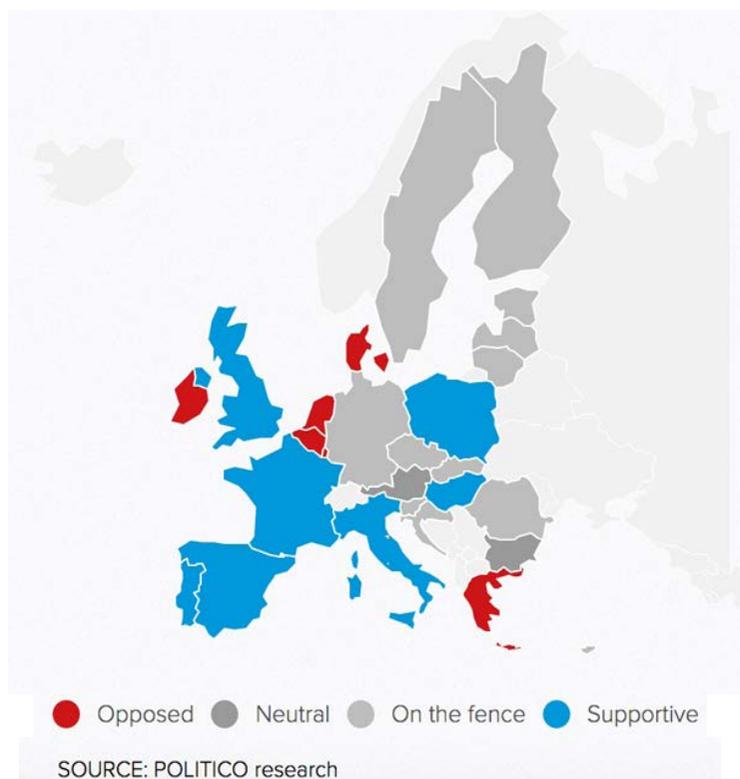
- In addition, the Interim Report discusses interim measures that some countries have indicated they would implement, believing that there is a strong imperative to act quickly. In particular, the Interim Report considers an interim measure in the form of an excise tax on the supply of certain e-services within their jurisdiction that would apply to the gross consideration paid for the supply of such e-services. There is no consensus on the need for, or merits of, interim measures, with a number of countries opposed to such measures on the basis that they will give rise to risks and adverse consequences. The Interim Report describes, however, the framework of design considerations, identified by countries in favour of introducing interim measures, which should be taken into account when considering introducing such measures.
- The Interim Report also takes stock of progress made in the implementation of the BEPS package, which is curtailing opportunities for double non-taxation. Country-level implementation of the wide-ranging BEPS package is already having an impact, with evidence emerging that some multinationals have already changed their tax arrangements to better align with their business operations. The measures are already delivering increased revenues for governments, for example over 3 billion euros in the European Union alone as a result of the implementation of the new International VAT/GST Guidelines. Also, the impact of widespread implementation of the BEPS package, including recent EU directives as well as some aspects of the US tax reform should result in neutralising the very low effective tax rates of some companies. Nonetheless, BEPS measures do not necessarily resolve the question of how rights to tax are shared between jurisdictions, which is part of the long term issue.
- Finally, the Interim Report identifies new areas of work that will be undertaken without delay. Given the availability of big data, international cooperation among tax administrations should be enhanced, in particular, as regards the information on the users of online platforms as part of the gig and sharing economies, to ensure taxes are paid when they are due. The Forum on Tax Administration, working with the Inclusive Framework, will develop practical tools and cooperation in the area of tax administration and will also examine the tax consequences of new technologies (e.g., crypto-currencies and blockchain distributed ledger technology).
- An update on this work will be provided in 2019, as the Inclusive Framework works towards a consensus-based solution by 2020.

The European Union

The European Commission does not want to wait until a global solution has been agreed for fear that current structures will manifest and more public revenue is lost, and has put forward its own proposals of how to address the issues in the long-term and in the short-term. As a first step in late 2017, the EU Commission and Council officially identified various possible avenues to make the taxation of digital activities fairer. It put forward a long-term solution, which proposes to embed the taxation of the digital economy in the general international tax framework, and a short-term solution in the interim, such as an equalisation tax on turnover of digitalised companies, a withholding tax on digital transactions or a levy on revenues generated from the provision of digital services or advertising activities. On 21 March 2018, the Commission advanced two Directive proposals, namely (1) a long-term solution to reform corporate tax rules so that profits are registered and taxed where businesses have significant interaction with users through digital channels, and (2) a short-term solution of an interim tax which covers the main digital activities that currently escape tax altogether in the EU.

The long-term solution is aimed at setting out a comprehensive solution within the existing EU corporate tax systems to tax digital activities in the EU. The proposal lays down rules to determine a taxable nexus for digital businesses operating across border in case of a non-physical commercial presence or "significant digital presence". The concept of "significant digital presence" is meant at creating a taxable nexus in a jurisdiction where the digital business does not have any physical presence. Secondly, the proposal sets out principles for attributing profits to a digital business. These principles should better capture the

Figure 6: Where EU Member States stand regarding the EU Commission proposal



Spotlight: EU Commission proposal

On March 21, 2018, the European Commission presented a series of measures aimed at ensuring a fair and efficient taxation of digital businesses operating within the EU. The package includes both interim measures, in the form of a 3% Digital Services Tax on revenues, and a long-term solution, introducing the concept of a digital permanent establishment.

Introduction of a Digital Services Tax

The proposal for a Directive on the common system of a digital services tax on revenues resulting from the provision of certain digital services intends to avoid potential disparities arising within the EU as a result of the implementation of unilateral initiatives by Member States and proposes a coordinated approach to tax revenues from certain digital services.

The new Digital Services Tax (DST) would apply as of January 1, 2020, and would be levied at the single rate of 3% on gross revenues:

1. The DST would apply to certain digital services, including the supply of advertising space, the making available of marketplaces that facilitate transactions directly between users, and the transmission of collected user data, while the supply of digital content or payment services, as well as trading venue and regulated crowdfunding services, would be excluded.
2. Businesses that cumulatively meet certain thresholds would be subject to the DST, i.e. entities with a total annual worldwide revenue above EUR 750 million and a total annual revenue stemming from digital services in the EU above EUR 50 million. If the entity is part of a consolidated group, thresholds should be assessed at the level of the group.
3. The DST should be due in the Member States where the users are located. If the users are located in different Member States, the proposal also provides for the tax base to be attributed between Member States based on certain allocation keys. The Directive also provides for cooperation between Member States in the form of a one-stop-shop mechanism, allowing taxpayers to have a single point of contact to fulfill all administrative obligations in relation to the new tax (i.e. identification, reporting, and payment). In addition, taxpayers should have the possibility to deduct the DST from their corporate income tax liability, so as to partially mitigate double taxation.

Introduction of a Digital Permanent Establishment

The proposal for a Directive laying down rules relating to the corporate taxation of a significant digital presence

value creation of digital business models which highly rely on intangible assets. As regards profit attribution, the rules will be built on the current principles for profit attribution and be based on a functional analysis of the functions performed, assets used and risks assumed by a significant digital presence. Transfer pricing rules are explicitly referred to. In determining the attributable profits, due account shall be taken of the economically significant activities performed by the significant digital presence relevant to the development, management and exploitation of intangible assets (see Infobox on the EU Proposals for further detail.)

While EU governments agree that tax rules should be changed to increase levies on digital services that are currently undertaxed, they want to pursue different strategies to get there. Smaller states with lower tax rates such as Luxembourg and Ireland, home to large American multinationals, want EU changes to come together with a global reform of digital taxation, which has been under discussion for years to no avail.

In the short-term, the EU Commission has proposed a Digital Services Tax (DST) for adoption by EU member states. The measure is meant to prevent unilateral, non-coordinated actions by single EU member states (e.g. Italy, Slovakia, other). The DST is a 3% levy on gross revenues that would be levied alongside corporate income tax. The DST is charged annually and will also apply to domestic transactions to avoid being in breach of the provision of the freedom of providing inter-EU services. In relation to this solution proposed, there is a need to assign taxing rights. To that extend the focus is placed on user value creation: for example, in the case of sale of advertisements space, the focus will be on where the advertisement is placed; in the case of sale of data, where the user whose data are sold used a device to access a digital interface, whether during that tax period or any previous one; and in the case of availability of digital platform / marketplaces to the user, where the user uses a device in that tax period to access the digital interface and concludes an underlying transaction on that interface.

Europe is split regarding the European Commission's proposals. While EU governments agree that tax rules should be changed to increase levies on digital services that are currently undertaxed, they want to pursue different strategies to get there. Smaller states with lower tax rates such as Luxembourg and Ireland, home to large American multinationals, want EU changes to come together with a global reform of digital taxation, which has been under discussion for years to no avail. Larger states, such as France and Italy, which claim to have lost millions of euros of tax revenue due to digital giants' shift of taxable profits to lower-tax countries, want a quick solution and support the proposals. Figure 6 below shows where EU member states stand regarding the EU Commission's proposal.

Austria, as the current EU's rotating presidency holder, highlighted in a document for a meeting scheduled to take place in September 2018, that in the context of eleven of the 28 members states already considering their own national measures, reaching a uniform agreement was important

has a broader scope than the Digital Services Tax and is designed to introduce a taxable nexus for digital businesses operating within the EU, with no or only a limited physical presence. It also sets out principles to attribute profits to businesses having such "significant digital presence":

1. The Directive aims at taxing under the normal corporate income tax system of a Member State, profits generated by businesses providing certain digital services and having a "significant digital presence" within this Member State.
2. The notion of "significant digital presence" builds on the existing permanent establishment concept and covers any digital platform such as a website or a mobile application that meets one of the following criteria: annual revenue from providing digital services in a given Member State exceeds EUR 7 million, the annual number of users of such services is above 100,000, or the annual number of online contracts concluded with users in a given Member State exceeds 3,000.
3. The Directive would be applicable to EU taxpayers, as well as enterprises established in a non-EU jurisdiction with which there is no double tax treaty with the Member State where the taxpayer is identified as having a significant digital presence. However, it does not affect taxpayers established in a non-EU jurisdiction where there is a double tax treaty in force, unless such treaty includes a similar provision on digital presence.
4. The proposed rules on profit allocation are mainly based on the current OECD framework applicable to permanent establishments and suggest the profit split as preferred method. Nevertheless, the Directive also details a list of economically significant activities that should be taken into account to reflect the fact that value is created where users are based and data is collected. Finally, the measures proposed by the European Commission include Recommendations to the Member States to amend their double tax treaties with third countries, so that the above rules also apply to non-EU companies. The objective of the recommendations is to address situations involving non-EU jurisdictions without violating the Member States' existing treaties. It is expected that once a Member State applies provisions to comply with the above concept of a digital permanent establishment with respect to a country, that Member State will also cease to apply the DST with respect to that country. The proposals will now be submitted to the European Parliament for consultation and to the Council for adoption by unanimity.

so as to not undermine the EU common market. Under the current proposal, only firms with a global annual turnover of 750 million euros and EU revenue of at least 50 million euros a year would be taxable. Some 200 companies would fall within the scope of the new tax proposed by the Commission, with an estimated additional annual revenues of about 5 billion euros (\$5.7 billion) at EU level. To overcome some of the criticism of the measure by the strongest opponents, Austria proposed to reduce the scope of the tax, which would no longer be applied to the sale of users' data as in the Commission proposal. Only revenue from online advertising services (e.g. Google, Facebook), and from virtual marketplaces, such as Amazon, would be subject to the new tax, under the Austrian plan. A final decision and adoption of the EU proposal is pending, but likely to be carried over into 2019.

Concluding summary

The article sought to briefly examine the key features of the digitalized economy and the key issues that arise from them for taxation under current international tax rules, their repercussions at the local level, and provide a summary of what countries are doing to address the issues identified.

At the high level, the challenges brought about by the digitalized economy relate to the inability of the current international tax framework to ensure that profits are taxed where economic activities occur and where value is created.

At the high level, the challenges brought about by the digitalized economy relate to the inability of the current international tax

framework to ensure that profits are taxed where economic activities occur and where value is created. This is so because the two key concepts that the international tax framework is based on, namely the nexus rule based on physical assets and the profit allocation rule based on the arm's length principles are outdated and do not take account of the features that a digitalized economy exhibits. These features include mobility, reliance on data, network effects, use of multi-sided business models, tendency towards monopoly or oligopoly and volatility. These new features are said to enable economic actors to operate in ways that avoid, remove, or significantly reduce, their tax liability within traditional tax bases. They may also generate base erosion and profit shifting concerns in relation to both direct and indirect taxes.

In terms of challenges for the tax policy makers, the international tax framework must be in line with domestic corporate income tax systems, which should reflect the changed way of doing business based on the new features of the digitalized economy, to avoid distortive effects at the local and global levels. To address the high-level tax challenges relating to the international tax framework, the OECD and the EU have been working to drive the development of an international solution to digital economy taxation issues, with the focus on "nexus" (namely, addressing the disconnect between tax jurisdiction and the location of value creation by expanding the definition of PE to encompass "digital presence" as determined by the location of a service's users), and reallocating profits (namely, reallocating taxing rights among the "countries of residence", the tax havens, and the "countries of consumption" by modifying the formulas for allocating taxable income with the users' contribution in mind (boosting the share taxable by the countries of consumption)). While global solutions to fix the international tax

system are pending, individual countries such as the UK, Australia, France, Italy, Slovakia, India, and many others are moving forward with consultations, proposals and implementation of short-

To address the high-level tax challenges relating to the international tax framework, the OECD and the EU have been working to drive the development of an international solution to digital economy taxation issues, with the focus on "nexus", and reallocating profits .

term gap-stop measures, including digital services taxes, digital transaction taxes, digital platform taxes, equalization levies and changes to concepts of permanent physical establishment.

In summary, taxation should manage the interests of stakeholders at the domestic but also at the global level, and its effect should be neutral across different sectors of the economy and countries. The advent of the digitalized economy exacerbates issues, some of which were already present with global activities of MNEs prior to the extent of digitalization that we face today. This is currently not reflected in the international tax framework. It is therefore important that countries continue the dialogue and jointly identify solutions to adjusting the international tax framework to reflect technological and economic advancement and societal development and thereby minimize global asymmetries and local distortions. 

REGIONAL NEWS

International Telecommunications Union Elects Emiratis to Important Posts

Reinforcing the UAE's leading position in information communications technology, ICT, Saif Bin Ghalaita, Executive Director of Technology Development Affairs Department, Telecommunications Regulatory Authority, TRA, was elected as Vice Chairman of the International Telecommunications Union, ITU, Council and Abdul Aziz Al Zarooni, Information Security Engineer at the TRA, was named Chairman of the Working Group on the Child Online Protection initiative of the ITU. Tariq Al Awadhi, Executive Director of Spectrum Management at the TRA, chaired the Arab Group during the conference. The selection was announced on the concluding day of the ITU's Plenipotentiary Conference, PP-18, which was held at the Dubai World Trade Centre. The achievement reflects the on-going efforts of the UAE in the ICT sector and acknowledges the outstanding potentials of the UAE citizens, who have, time and again, proved their competence in scientific, economic and cultural fields. Commenting on his selection, Bin Ghalaita said, "I am proud to be representing my country in this important position and I will work hard to implement the policies and promote initiatives that serve the Sustainable Development Goals, SGDs, and help in the implementation of our national policies. Also, I will spare no effort to achieve the vision of the ITU in

ICT, which is the driving force behind the prosperity and development of people, worldwide." He added, "The ITU Council is the governing body and its role is to consider broad telecommunication policy issues and ensure that the union's activities, policies and strategies are equipped to handle today's dynamic and rapidly changing telecommunications environment." Bin Ghalaita stressed that the UAE's future-ready leaders have always proved that they are capable of leading global positions. He added, "We are the children of Zayed, we have learnt from and have grown up in the presence of great leaders. They have wanted us to emerge as examples in success and leadership." Al Awadhi chaired the Arab Group, one of the member groups out of a total of five that proposed their technological contributions and assessed the state of ICT in their countries. "The Arab Group offered technical contributions and presented its role in enhancing the ICT sector in the Arab region. The UAE is positioned at the forefront to lead the smart transformation, connecting the world and building the right infrastructure, hence we are happy to lead the Arab Group." Al Zarooni said, "It is a great honour for me to lead a team that protects the younger generation from the perils of cybercrime, which is one of the more serious threats faced by children

today. As part of this team, our workload is overwhelming, especially at a time when most countries of the world are adopting smart education policies that facilitate easy internet access to children and hence making them more vulnerable to cybercrime." "We will work collaboratively with other sectors to create a safe digital community for children while enabling them to surf the internet. We will do this by adopting a comprehensive approach towards promoting child safety on the internet and by developing strategies that cover five key areas, including legal, technical and procedural measures, organizational structure, capacity-building and international cooperation," he explained. The Child Online Protection initiative, which aims to create a safe and empowering digital community for children around the world, also helps member states implement these initiatives. The initiative came into being during the wake of multiple child frauds on the internet, fuelled by the proliferation of smart devices and unlimited access to the internet. The conference, which was held in Dubai from 29th October to 16th November 2018, closed with the signing of the Final Acts. The conference attracted more than 2,300 participants from 180 countries this year, up from 171 countries in 2014.



Eng. Saif Bin Ghalaita
Executive Director of Technology
Development Affairs Department,
(TRA)



Eng. Tariq Al Awadhi
Executive Director of Spectrum
Management at the TRA



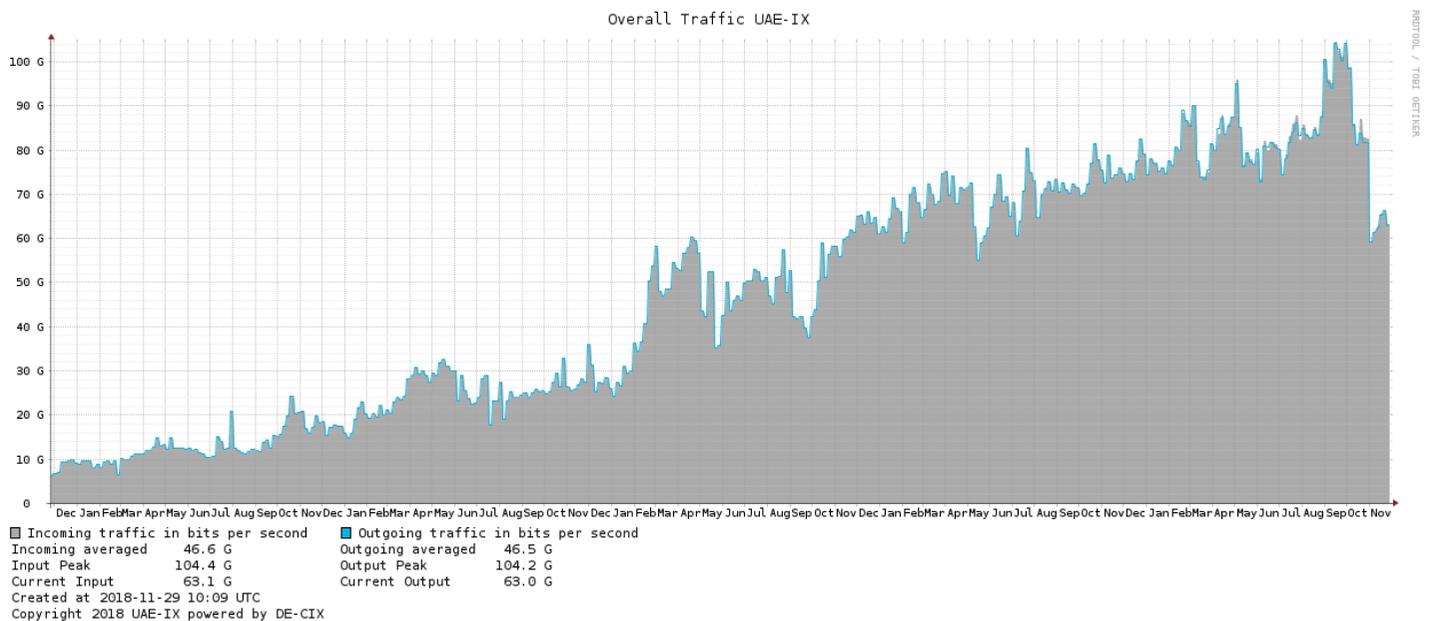
Eng. Abdul Aziz Al Zarooni
Information Security Engineer at the
TRA

UAE-IX Soars Past 100Gbps of Traffic

UAE-IX, an Emirates Integrated Telecommunications Company (EITC) initiative with support from the UAE's Telecommunications Regulatory Authority (TRA), has announced that it has exceeded 100Gbps of internet peering traffic, with over 64 regional and global customers now using the carrier-neutral Internet Exchange Platform (IXP). Farid Faridooni, Deputy CEO Enterprise Solutions, EITC, said: "Attaining 100Gbps traffic has benchmarked our capabilities far beyond expectation and this most recent accomplishment truly highlights UAE-IX as a more than

competent player in the IXP market. He added, "With latency being reduced by up to 80 per cent and costs being reduced by up to 70 per cent for users, UAE-IX is making gallant strides towards realizing the needs of interconnected global networks, network operators and content providers in the region." UAE-IX, managed in partnership with Global Internet Exchange operator DE-CIX, delivers a local alternative for regional traffic exchange by localizing internet content. Initiated by EITC, with support from the UAE's Telecommunications Regulatory Authority

(TRA), UAE-IX improves IP network resilience, routing efficiency and the quality of the Internet experience for end-users. The IXP is built on a fully redundant switching platform located in datamena (DX1) in Dubai. Since its inception in 2012, UAE-IX has become the biggest IXP in the Middle East and North Africa in regards to the number of participating networks and traffic volumes. UAE-IX's highly anticipated Annual Peering Event will take place on the 28 November, 2018 in Dubai.



UAE Elected Fourth Time for ITU Council Membership

The UAE has been elected four time in a row for the ITU Council membership and representing Asia and Australia region as E Area in ITU. International Telecommunications Union has 13 seats in the area (E). Additionally, the UAE secured 164 votes. UAE Succeeding Fourth Time for ITU Council Membership. Furthermore, the elected countries for Area E included Saudi Arabia, Kuwait, Australia, China, India, Indonesia, Iran, Japan, South Korea,

Pakistan, the Philippines and Thailand. Hamad Obaid Al Mansoori, TRA director general, said: The UAE's election for the ITU Council confirms the UAE's leading role in shaping the future, and the great trust it has received by other countries. The UAE has become a key player in all international forums and is actively contributing to the development of strategies and plans on which the world of tomorrow will be built. He further added that: The UAE is keen to

spread security and prosperity among all countries in the world. Over the next four years, the UAE will activate all decisions and proposals adopted by the ITU aimed at achieving sustainable development and reaching a more secure, stable and prosperous word. Furthermore, this fourth time winning results shows the UAE's leading position in the global ICT sector. Additionally, it has been a key supports of all the development struggle in the world.

UAE Makes Big Leap in ICT Competitiveness

The UAE has made a big leap in the Global Competitiveness Index (GCI), according to the recent Global Competitiveness Report issued by the World Economic Forum (Davos) 2018. The country has advanced 18 places in "ICT Adoption" from 24th to 6th place globally. This theme measures the efficiency of the telecommunications sector in countries through a number of global competitiveness indicators. The report also showed that the UAE has ranked first in the world in the Global Competitiveness Index for mobile broadband subscription rate, and ranked second globally in the mobile subscription index. These results reflect the significant progress made by the UAE in ICT, which is the outcome of TRA's diligent work, guided by the directives of the country's wise leadership, said a TRA statement. "Such results also reflect the effectiveness of strategies adopted by the UAE in the fields of ICT, Artificial Intelligence and the Fourth Industrial Revolution," it said. Hamad Obaid Al Mansoori, TRA Director General, said: "These results reflect the great efforts made by the TRA, in collaboration with its public and private partners, in the development of the ICT sector, guided by the directives of the wise leadership, which has provided us with a roadmap to reach the sky. The remarkable success that the UAE is witnessing these days is the fruit of many years of planning and hard work. "Today, we are in the world's top rankings in various technical and economic fields. We launched Khalifa Sat and have the Hope Probe, our own project for discovering Mars. Today, we are hosting ITU's Plenipotentiary Conference (PP-18), the most important ICT event. The UAE is not only involved in shaping the future, but also

promotes happiness and prosperity around the world through a comprehensive sustainable development based on a well-established future knowledge economy," Al Mansoori said. The TRA continues to work with operators to raise the country's ranking in global competitiveness indicators by continuing to develop the telecommunications sector and its infrastructure, providing the best services to subscribers, and regulating and facilitating the entry of state-of-the-art telecommunications technology to the UAE, thereby contributing to its global leadership in this sector.

The United Arab Emirates Achieves Great Progress in the Global Competitiveness Index



According to the Global Competitiveness Report 2018
issued by the World Economic Forum

Pakistan Government Considers Imposing Regulatory Duty on Unregistered Mobile Phones

The government is considering to impose a regulatory duty (RD) along with a minor penalty on unregistered & used mobile phones. The duty levied will be contingent on the category the phone set falls in. As per media reports, blocked mobile phones will be unblocked once the duty and the penalty have been paid at the nearest customs point. For now, the government is mulling over how much of a regulatory duty it will charge on phones, depending on their make and model. The duty rates will be presented before the federal cabinet for approval before notifying them to the public. Government is considering levying this duty in order to prevent the hefty losses it faces because of illegal phone imports. According to an estimate,

annual revenue losses due to illegal phone imports amount to \$1.5 billion. Moreover, legal imports of mobile phones were valued at \$847.656 million in 2017-18. The previous years have seen a sharp drop in legally imported mobile phones. These imports were once more than \$1 billion, which resulted in an increased customs duty and ultimately led to the smuggling. As for blocking the used and refurbished cell phones that have been smuggled in the country via different channels, authorities are going to employ the Device Identification, Registration, and Blocking System (DIRBS) mechanism. Notably, the Pakistan Telecommunication Authority (PTA) rolled out the DIRBS system in May 2018 to prevent the smuggling of illegal

and substandard phones in the country. An official sources informed the media that from November 15, all consumers will have to text the International Mobile Equipment Identity (IMEI) number of the handset to 8484. The IMEI number is printed on the box of a new cell phone. After texting the IMEI, the consumer will receive a reply stating whether the set complies with the regulatory standards. If the set is non-compliant, the customer will receive a text asking him/her to pay the customs duty along with the penalty within two months. It should be kept in mind that all the unregistered mobile phones will be blocked after two months.

Kuwait Elected ITU Board Member

Kuwait was elected member of the International Telecommunication Union (ITU) Board for a four-year term. President of Kuwait's Communication and Information Technology Regulatory Authority (CITRA) Eng. Salim Al-Ozainah expressed in a statement to KUNA his satisfaction over winning the ITU council membership, which he dedicated to His

Highness the Amir Sheikh Sabah AlAhmad Al-Jaber Al-Sabah. Kuwait was elected member of the ITU Board following the Union internal voting on other posts, on sidelines of the 2018 ITU Plenipotentiary Conference held in Dubai. Al-Ozainah expressed gratitude to the Kuwaiti Foreign Ministry, namely the permanent representative at the UN and International

Organizations in Geneva, Ambassador Jamal AlGhunaim, for their efforts that paved the way for winning a seat in the international board. Kuwait has advanced significantly in the telecommunication field, ranking 37th globally over the past two years. It has been a member of the ITU since 1982.



Members of Kuwaiti Delegation Participating at the 2018 ITU Plenipotentiary Conference held in Dubai

Telecom Subscribers Reached 22.8 Million in UAE

According to the report of Telecommunication Regulatory Authority (TRA) report, the telecommunication subscribers including fixed-line and data services in reached 22.8 million in UAE by the end of August 2018. Telecom Subscribers Reached 22.8 Million in UAE. According to the same statistics, the number of mobile phone subscribers reached around 19.154 million which equivalent to 217 lines per 100 inhabitants. Furthermore, at the same place, mobile phone services become the reason for the 80 percent of the revenue. The country's main telecom operators Etisalat Group and Emirates Integrated Telecommunications Company took great parts in accounting 80 percent revenue. Pre-paid subscribers reached 15.734 million by the end of August 2018. Additionally, mobile subscribers reached 3.419 million at the end of August 2018. This is recorded that up to 1.360 million people are going to subscribe internet services by the end of August 2018. There are 99.9 percent of people who are choosing broadband services. Additionally, fixed-line subscribers hit 2.326 million by the end of August.



Fixed Broadband in Sri Lanka Cheapest in Asia

The cost of fixed broadband in Sri Lanka is the cheapest within Asia and second globally, according to the latest survey conducted by Cable.co.uk with the assistance of international consumer insight consultancy BVA BDRG between 15 August and 20 September 2018. Data from 3,303 fixed-line broadband deals in 195 countries was gathered and analyzed to compile the latest rankings (available at www.cable.co.uk/broadband/deals/worldwide-price-comparison/) released yesterday. Sri Lanka's average package price was quoted as \$ 5.65 per month. "Sri Lankan broadband is supplied by incumbent provider Sri Lanka Telecom, providing 21 Mbps ADSL and 100 Mbps FTTH. It is incredibly cheap, with ADSL available from just \$ 3.19 per month," Cable.co.uk said. It said Ukraine offers the world's cheapest broadband, with an average cost of \$ 5.00 per month. The West African nation of Mauritania is the most expensive, with an average package price of \$ 768.16. Within Asia, Iran at \$ 8.20 came second followed by Nepal (\$ 16.47). The Maldives (\$ 81.55), Brunei Darussalam (\$ 123.29) and Laos (\$ 239.25) provide the most expensive package prices per month in Asia. Four of the top six cheapest countries were formerly a part of the USSR (now collectively known as the Commonwealth of Independent States or CIS) including the Russian Federation itself, which is the world's fourth cheapest country, with an average package cost of just \$ 9.77 or around one-seventh the cost of broadband in the US. Commenting on the findings of the research internationally, Dan Howdle, consumer telecoms analyst at Cable.co.uk, said: "Despite many countries providing faster access year-on-year, and the price of broadband fluctuating

– sometimes wildly – from country to country, on average the price of broadband worldwide remains largely unchanged, falling just 1.64% since the fourth quarter of 2017. "In our worldwide broadband speed comparison, released earlier this year, similar disparities were apparent to those seen here. The countries with slow, patchy broadband infrastructure that supplies only a fraction of the population tend to be the most expensive. Likewise, those with exceptional, often full-fibre (FTTH) infrastructure supplying the majority of the population tend to be the cheapest, if not in absolute terms, certainly on a cost-per-megabit basis. Within Western Europe, Italy is the cheapest, with an average package price of \$ 29.48 per month, followed by France (\$ 31.14), Germany (\$ 36.68) and Monaco (\$ 37.00). The UK came in fifth cheapest out of 29 Western European nations (and 61st cheapest worldwide), with an average package price of \$ 39.58 per month. In the Near East region, war-ravaged Syria came in cheapest with an average monthly price of \$ 13.00 per month (and ranked seventh overall), with Saudi Arabia (\$ 95.72), Bahrain (\$ 96.29), Qatar (\$ 140.58), Oman (\$ 150.63) and the United Arab Emirates (\$ 157.10) providing the most expensive connectivity in the region. Mexico is the cheapest country in which to buy a broadband deal in Central America, with an average broadband package cost per month of \$ 33.32. Panama is the most expensive with an average package price of \$ 108.38 per month. In North America, Canada offers the cheapest broadband on average (\$57.66), coming in 22 positions ahead of the United States globally (\$67.69). Bermuda provides the most expensive packages in the region with an average

price of \$124.36 per month. Saint-Martin (France) offers the cheapest broadband in the Caribbean, with an average package price of \$23.78 per month, with the British Virgin Islands (\$141.17), Cayman Islands (\$158.69), Antigua and Barbuda (\$177.15) and Haiti (207.39) at the most expensive end, both regionally and globally. Sub-Saharan Africa fared worst overall with almost all of its countries in the most expensive half of the table. Réunion, off the east coast of Madagascar, was the cheapest in the region, coming in 48th overall with an average package price of \$35.45. Mauritania, meanwhile, charges residential users an average of \$768.16 per month and is the most expensive in the world. Mali (\$160.53), Tanzania (\$181.80), Burkina Faso (\$201.94) and Namibia (\$383.83) join Mauritania as the most expensive countries in the region, and sit among the ten most expensive countries in the world. 11 of the 12 countries studied in Oceania were found in the most expensive half of the global table (Australia being the only exception). Generally, larger landmasses such as Australia and New Zealand are cheaper than smaller islands states. Vanuatu (\$138.54), Cook Islands (\$171.34) and Papua New Guinea (\$571.67) are the most expensive in the region, with Papua New Guinea coming in second-most expensive in the world. Despite significant year-on-year ups and downs in broadband pricing in various countries around the world, the average price of a broadband deal globally remains constant, dropping just \$0.12 overall, from \$73.04 to \$72.92, or around 1.64%, between the fourth quarter of 2017 and the fourth quarter of 2018.

Wataniya Palestine Grows Customer Base to 1.3 Million in Q3

Wataniya Mobile's subscriber base increased by 57 percent year-on-year to 1.3 million at end-September, benefiting from the Gaza launch in October 2017. The total was up from 1.2 million customers reported at the end of June. The operator made good progress in the first nine

months of the year, with the launch of the 3G network in the West Bank in January, parent company Ooredoo announced. Revenue increased to KWD 23.0 million in the first nine months, up by 19 percent compared to KWD 19.3 million for the same period in 2017. EBITDA increased to KWD

5.8 million compared to KWD 5.1 million a year ago. Wataniya also announced that it's started the process of rebranding to the Ooredoo name. The switch should be completed in the coming weeks with a formal ceremony with Ooredoo officials.

Pakistan Re-Elected for Administrative Council of International Telecommunication Union

Pakistan taken a four-year term (2018-2022) for the Administrative Council of the International Telecommunication Union (ITU) during the elections held in Dubai, UAE. Pakistan Re-Elected for Administrative Council of International Telecommunication Union. During the elections, Pakistan has secured 155 out of a total 177 votes to become one of the 13 countries elected to this important body from the Asia and Australasia region. Furthermore, Pakistan will remain engage with the work of the council and will collaborate with member states. This effort will make ITU stronger and more responsive to the current challenges and opportunities in ICTs.

Additionally, the winning Member States, for the ITU Council from 2018-2022, are:

Region A – The Americas (9 seats) – Argentina; Bahamas; Brazil; Canada; Cuba; El Salvador; Mexico; Paraguay; United States.

Region B – Western Europe (8 seats) –

France; Germany; Greece; Hungary; Italy; Spain; Switzerland; Turkey.

Region C – Eastern Europe and Northern Asia (5 seats) – Azerbaijan; Czech Republic; Poland; Romania; Russian Federation.

Region D – Africa (13 seats) – Algeria; Burkina Faso; Côte d'Ivoire; Egypt; Ghana; Kenya; Morocco; Nigeria; Rwanda; Senegal; South Africa; Tunisia; Uganda.

Region E – Asia and Australasia (13 seats) – Australia; China; India; Indonesia; Iran (Islamic Republic of); Japan; South Korea; Kuwait; Pakistan; Philippines; Saudi Arabia; Thailand; United Arab Emirates.

Last week in New York, Pakistan was also re-elected to the United Nations Committee on Contributions (CoC) by acclamation. The committee is one of the key UN bodies that work on the methodology to determine each UN member state's individual mandatory share of financial contribution to the United Nations budget.

The winning candidates to serve on the

Radio Regulations Board from 2019-2022 are:

The Americas – Chantal Beaumier (Canada); Fernando Borjón Figueroa (Mexico).

Western Europe – Yvon Henri (France); Lilian Jeanty (Netherlands)

Eastern Europe and Northern Asia – Sahiba Hasanova (Azerbaijan); Nikolay Varlamov (Russian Federation).

Africa – Elsayed Azzouz (Egypt); Samuel Mandla Mchunu (South Africa); Hassan Talib (Morocco).

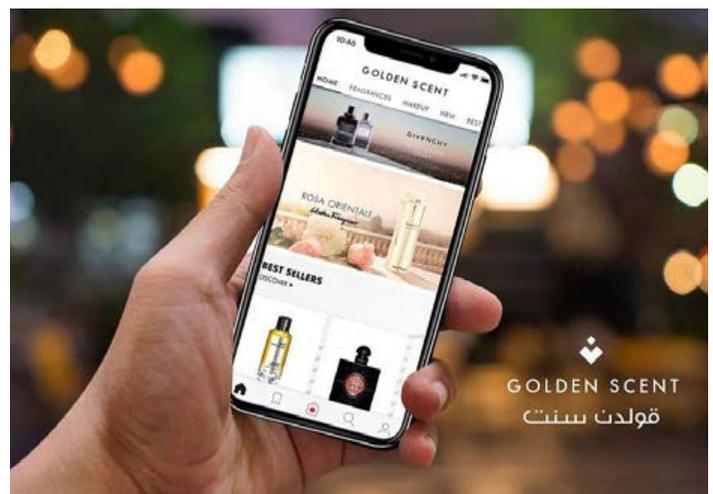
Asia/Australasia – Tariq Alamri (Saudi Arabia); Akira Hashimoto (Japan); Doan Quang Hoan (Vietnam).

According to the telecom experts, Pakistan's image in the telecom world has amended in the recent past due to the efforts by the Ministry of Foreign Affairs, Ministry of Information Technology and Telecommunication as well as Pakistan Telecommunication Authority (PTA) by winning the elections.

Saudi e-Commerce Start Up Golden Scent expands to UAE, Kuwait

Saudi-based perfume and cosmetics platform Golden Scent has expanded to the UAE and Kuwait, crossing 1 million app downloads and raising its product portfolio by 250%. The start-up expects to triple its customer base in 2018 compared to the year before as many move to shopping on their mobile phones. "The online shopping behavior of Saudi consumers has seen a major shift from web to app usage in e-commerce over the past years," said CEO Malik Shehab. "Therefore, we gave the customers exactly what they are looking for and made their shopping experience more convenient with our new app. On the other hand, our app offers tremendous advantages to featured brands - such as higher conversion rates and a boost to customer loyalty and retention." He added that the app will boast new features in the coming months, while the platform itself will include more local brands. Golden Scent's product offerings in the makeup and skincare category grew 40%, while new categories such as beauty tools and hair care were introduced. "Our first step was to streamline the purchase experience. We're now investing in scaling up both our presence and our product lines so consumers have incredible choice mated to convenience. We're not just giving our clients access to the widest possible range of beauty

products but are also going the extra mile to tie up with trending brands that are available exclusively through us," Shehab said. Last year, the start up's Series A funding was backed by Saudi Aramco Entrepreneurship Venture, Equitrust, Wamda Capital and Raed Ventures.



Oman's Largest Commercial Data Center to Come Up in Jebel Akhdar

A leading data center hosting Services Company in Oman, Data Mount is planning to establish the largest commercial data center in the country in Jebel Akhdar. The company has signed a Memorandum of Understanding (MoU) with Cisco, which will provide data center technology and enable Data Mount design, deploy and secure its next-generation cloud services in a data center in Oman's famous green mountains - Jebel Akhdar. The MoU establishes a framework for closer collaboration between Cisco and Data Mount, leveraging Cisco's innovative networking, data center and security infrastructure solutions, cloud hardware and managed services for cloud and collaboration. The MoU also outlines a number of potential areas for strategic cooperation to deliver state-of-the-art cloud services in the data center. 'In line with the Digital Oman Strategy, more businesses are looking at cloud

computing as an enabler on their digital transformation journeys. To meet the ever-increasing demand of Omani companies to host their critical IT infrastructure in the cloud, we are planning to build a brand new data center in Jebel Akhdar. From there, we will offer customers the option to store their data securely in the cloud inside the country,' said Abdull Hakeem al Muslahi, deputy chairman, Data Mount. 'Cisco, as a global technology leader and an expert in intelligent data center technology, is the perfect company to help us in this project. We look forward to working closely with them and leveraging their knowledge, expertise, innovative technologies, best practices and skilled resources. From this new data center, we plan to offer cloud and disaster recovery services to government organizations and enterprises, with a strong focus on the banking industry.' The new data center in Jebel Akhdar,

located in the Al Hajar mountain range will offer a safe and secure location with moderate temperatures, so that Data Mount can save on power consumption and protect its data center equipment from overheating. Ali al Lawati, general manager of Cisco Oman, said, 'Oman has been at the forefront of prioritizing digital transformation, innovation and the adoption of advanced technologies, with cloud computing leading the charge. We are excited to collaborate with Data Mount and help them establish an innovative and intelligent data center of the future. 'One of the fundamental principles of the next-generation data center is the ability to dynamically deliver business critical applications. Massive data volumes, speed of access and the longevity of data are key drivers for the transformation of data centers in the region.'

Saudi Telecom Sector Profits Rise 11 Percent in Q3

Saudi Arabia' telecommunication services sector's profits increased by 11% year-on-year in the third quarter of 2018, supported by strong financial results of Mobile Telecommunication Company Saudi Arabia (Zain) and Saudi Telecom Company (STC). Profits of three telecom firms listed on the Saudi Stock Exchange (Tadawul), namely Zain, STC, and Etihad Etisalat Co (Mobily), amounted to SAR 2.66 billion during the three-month period ended September, up from SAR 2.4 billion in the year-ago period, according to Mubasher's statistics based on the companies' statements. During the first nine months of 2018, the three companies' profits grew 6% to SAR 7.4 billion, compared to SAR 7 billion in the same nine months a year earlier. The Saudi telecommunication services sector

comprises of four firms. The fiscal year of three of them ends in December, while Etihad Atheeb Telecommunication's (Go) fiscal year finishes in March. The telecom sector's operational profits went up 15.3% to SAR 3.6 billion from July to September this year, compared to SAR 3.13 billion in the same period of 2017. The sector's operational profits rose 9.3% to SAR 9.7 billion in the nine-month period ended September, from SAR 8.87 billion in the corresponding period a year before. STC acquired the largest profit of the Saudi telecom sector with SAR 2.64 billion during Q3-18, up from SAR 2.57 billion in Q3-17. STC's profit also rose 2.85% to SAR 7.76 billion in the first nine months of this year, compared to SAR 7.46 billion in the same period a year earlier. Earlier Saudi Zain

stated that net profits skyrocketed 1500% to SAR 48 million during Q3-18, from SAR 3 million in Q3-17, while it turned to loss in the first nine months of 2018 after incurring SAR 67 million, against a profit of SAR 57 million during the same period last year. Mobily previously reported trimming losses by 82.3% to SAR 31 million during Q3-18, compared to SAR 174.5 million during the same quarter in the year before, in addition to reducing losses by 61.5% to SAR 203 million in the January-September period of 2018, from SAR 527.2 million in the same period a year earlier. By 2:09 pm Saudi time, Mobily's stock rose 1.66% to SAR 17.16, followed by STC's stock with 0.47%, reaching SAR 85.90, and Zain's stock surged 8.05% to SAR 6.58.

IRGC Exits Iran's Telecoms Sector

Iran's Islamic Revolutionary Guards Corps (IRGC) has sold off its stakes in the country's largest fixed and mobile operators. The financial arm of the military force says it has offloaded its shares in Tose'e Etemad Mobin, a consortium which holds interests in

fixed operator Telecommunication Company of Iran (TCI) and TCI's 90%-owned cellular subsidiary Mobile Communication Company of Iran (MCI). The move came after calls from politicians for the armed forces to exit Iran's economy.

Oman Data Park Introduces New Service Portfolio

Oman Data Park (ODP), the first managed service provider in the Sultanate of Oman, introduced artificial intelligence services to the Omani market at Omantel ICT Summit 2018. The service emulates human actions to automate and perform repetitive, high volume and time consuming business tasks. A new product, Robot as a Service, improves response times and increases accuracy in production, while improving productivity, allows 24x7x365 operations through the use of non-sleeping robots, increases efficiencies and optimizes the use of employees. ODP allows organizations in Oman to capitalize on the newly launched service with zero capital investment, as the service is charged on a monthly subscription basis to automate any function across the organization, whether it is the finance, HR, procurement or IT departments. Regarding the new services, Eng. Maqbool Al Wahaibi, CEO, Oman Data Park, said, "ODP is a leader in managed services,

and we are now leveraging advancements in artificial intelligence, and it is a proud moment for us as we bring forth the futuristic technology by launching Robot as a Service. The industry is evolving to meet the digital demands of tech-savvy customers, though many organizations are still relying on manual tasks in their operations. Organizations can now benefit

from such services to increase efficiency, reduce errors and drive employee-focus to more innovative tasks, since robots can be implemented in no time". Oman Data Park brings an unparalleled blend of experience, stature, and goodwill to provide managed services with the highest standards of reliability, security and responsiveness.



Pakistan's e-Commerce Market Nearly Doubles

Pakistan's e-commerce market almost doubled in fiscal year 2017-18 as digitalization paved the way for the services sector to increase its contribution to the gross domestic product (GDP) from 52% to 60%, according to the State Bank of Pakistan (SBP). E-commerce is booming in the country due to relatively larger penetration of internet, which is further making it easier to do business by lowering the cost of transaction. The business-to-consumer (B2C) side of e-commerce is growing rapidly whereas large-scale investment in the business-to-business (B2B) category is under way. Sales of local and international e-commerce merchants reached Rs40.1 billion in FY18 compared with Rs20.7 billion in FY17, an encouraging growth of 93.7%. However, the data only covers transactions made via digital channels such as credit/debit card, interbank funds transfer (IBFT), prepaid cards and mobile wallets, stated the SBP in its annual report for FY18. Market estimates put the share of postpaid cash-on-delivery (COD) settlements at around 80-90% of the total

volume and about 60% of the total value of e-commerce in Pakistan. It suggests that the total e-commerce activity in FY17 and FY18 may have touched Rs51.8 billion and Rs99.3 billion respectively, the report added. Digitalization of services is helping businessmen set up easier business systems. For example, a conventional exchange would involve multiple agents such as producers, transporters, wholesalers, retailers and consumers whereas e-commerce allows the possibility to bypass the middle parties, thereby allowing direct dealing between buyers and suppliers – a disintermediation of the process. In Pakistan, leading producers of apparel, smartphone, food and electronics industries now have a one-to-many online "e-retailing" channel in place. The country has got 152 million cellular subscribers, almost 73% of the total population of 207 million, out of which 59 million are 3G/4G subscribers with total internet subscribers at 62 million. Although there are lots of challenges that hinder the internet speed, the country has got a great potential to boost its online

economy. The major reason behind cash on delivery (COD) of up to 90% is that online platforms have not yet succeeded in building trust among customers. Longer delivery times are also often cited as a major deterrent to the wider adoptability of the e-commerce channel. Delivery times are usually affected when either a third-party logistics partner fails to deliver on time or the inventory management system of sellers proves inadequate to fulfill the flexible needs of the electronic channel, stated the SBP report. Despite its challenges, the e-commerce is growing in the country from a macroeconomic perspective. This notion is supported by some gains that have already been made as well as estimates of future potential. "According to a McKinsey Global Institute (MGI) report, Pakistan can experience an increase in its GDP by a cumulative seven percentage points (roughly \$36 billion) and create around four million new jobs during 2016-2025 via an increase in the use of digital financial services (DFS) alone," the report added.

Innovation Park Established with Collaboration of IPO & PCSIR Pakistan

Science, technology and innovation is the most important aspect and have brought tremendous advances around the world and become a massive power for the development of a country. By grouping the three gears science, technology and innovations we can promote knowledge-based economy in the country. The establishment of Science, Technology and Innovation Park (STIP) is a need of time. Keeping in mind the need, Intellectual Property Organization Pakistan (IPO-Pakistan) will fully support Pakistan Council of Scientific and Industrial Research (PCSIR) for the establishment of Science, Technology and Innovation Park (STIP). Intellectual Property Organization Pakistan (IPO-Pakistan) Chairman, Mr.

Mujeeb Ahmad Khan commit the strong determination with Mr. Shahzad Alam, Chairman, Pakistan Council of Scientific and Industrial Research (PCSIR). Pakistan Council of Scientific and Industrial Research (PCSIR) Chairman Mr. Shahzad Alam, briefed IPO Intellectual Property Organization Pakistan (IPO-Pakistan) about the establishment of Science, Technology and Innovation Park (STIP). PCSIR was establishing the innovation park at the basis of Pakistan scientific and industrial research Labs Complex, with an endeavor to develop an environment that will rouse research, creativity, innovation, technology development, entrepreneurship and commercialization in Pakistan. Pakistan Council of Scientific and Industrial

Research (PCSIR) stated that upon the completion of STIP, this model Park would promote the concept of "Knowledge-based Economy" in the country. IPO-Pakistan praised the idea of establishment of a model Park and assured that Intellectual Property Organization Pakistan (IPO-Pakistan) would extend its complete support in this regard. Science, technology and Innovations Park establishment is a widespread project through which a multiple opportunities are welcoming the youth to utilize their keen interest in the domain of industry-academia practically and to bring sensation in the career as well as in the country's economic development.

PTA, GSMA & CACF Organized Workshop on Advanced Spectrum Management for Mobile Telecommunications

Pakistan Telecommunication Authority (PTA), GSMA and Central Asian Cellular Forum (CACF) held its capacity building training workshop on "Advanced Spectrum Management For Mobile Telecommunications" at PTA headquarters in Islamabad under its strategic agreement to conduct a series of workshops in the region. The workshop was conducted by experts from GSMA at PTA Headquarters to enhance the policy & regulatory environment for the successful growth of spectrum in Pakistan. It is a two-day workshop that focuses on Spectrum Management For Mobile Telecommunications. Chairman PTA, Muhammad Naveed thanked the GSMA team who took out time to visit Pakistan for this workshop and shared their knowledge and experience. PTA is in the process of redrafting regulatory framework and its opportune time to take advantage of the recommendations by GSMA. The expert from GSMA Cristian Gomez, Director Spectrum Policy APAC while conducting the workshop on "Advanced Spectrum Management For Mobile Telecommunications", discussed case studies of regulatory environment and sector forces driving spectrum allocation

and assignment in APAC. Last year, the GSMA Capacity Building Program and the Central Asian Cellular Forum (CACF) signed a strategic agreement to deliver GSMA course content in several countries across Central Asia including Pakistan, Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. This workshop was another

training session under this agreement. The fundamental objective of the agreement between these two organizations is to help policymakers, regulators and other mobile eco-system stakeholders to keep pace with the latest industry developments through training courses that highlight examples of policy and regulatory best practice from around the world.



Bangladesh Fares Well in South Asia in ICT Adoption

Bangladesh has outperformed most of the South Asian nations in adopting information communication technology (ICT). According to the Global Competitiveness Index 4.0 2018, released by the World Economic Forum (WEF) on October 16, Bangladesh scored 39.8 in ICT adoption, while its neighboring country India scored 28 followed by Pakistan 23.6 and Sri Lanka 32.9. Nepal, the land-locked Himalayan country, has scored 40.4, a little bit higher than Bangladesh. However, the overall performance and readiness for adopting technology still remains lower compared to developed countries. "Technology is one of the areas where entrepreneurs perceived positive development in all selected indicators during 2018. Progress in ICT based activities both in public and private sectors contributed in this regard. However, overall ranking remains poor and stood at 102," the GCI report said. According to the report, 58% entrepreneurs admitted the improvement in quality of government services by using information technology, while another 40% opined that use of internet for selling goods and services has seen improvement. Another 55% respondent found that businesses use ICT for their smooth transaction and easing the business. "In technology adoption, we have seen positive changes in all indicators, though it is still poor," Centre for Policy Dialogue (CPD) research director Khondaker Golam Moazzem said, who presented the report on behalf of WEF in Dhaka. Technological readiness is slowly making progress. ICT-led education, trainings and business activities are getting popular. It is a good sign, said Moazzem in his presentation. The Republic of Korea is the world's champion in terms of broad-based ICT

adoption, with a near perfect score of 91.3 on this pillar. By contrast, India is among the weakest performers, with a score of 28 (117th), despite its vibrant IT sector, the report said. ICT adoption and innovation capability are the two areas where the South Asian region lags further behind the rest of the world, with the region's median performance is at only one-third of the global theoretical frontier, the report added. Commenting on India and Pakistan's performance on ICT adoption, the report stated that these two countries demonstrate the region's lowest levels of technological readiness, confirming the challenge for large emerging economies to fully integrate their entire population—especially those living in the most remote areas—into modernization processes. In last couple of years, both the government and private sector invested heavily in technology as the government has given policy supports to achieve the vision of a digital Bangladesh. These helped Bangladesh to earn a better score, business people opined. "A worker can send money to her parents using mobile banking. People can avail internet connectivity from any corners of the country," the Federation of Bangladesh Chambers of Commerce and Industry (FBCCI) president Shafiqul Islam Mohiuddin told the Dhaka Tribune. In providing services to people and business community using information technology, Bangladesh has seen a lot of progress. The development happened in the economy due to joint efforts of private sector and the government, said Islam. The government has provided policy supports and the private sector made investments. Besides, the government invested a lot to digitize public sector organizations, said Islam. Now the government has to concentrate on more transformation to digital services and making it a sustainable one, he added. Entrepreneurs said that ICT adoption facilitated business process and gave a boost to accessing to markets across the county, and beyond. "Due to broad-base adoption of information technology private sector is being benefited significantly. Businesses, whether it is big or small have been able to access to a bigger

market place as well as customer base from anywhere in the globe," Nihad Kabir, President of Metropolitan Chamber of Commerce and Industry told the Dhaka Tribune. The adoption of technology reduced the cost of doing business to some extent and expedited process, said Nihad. It has also reduced corruption, Nihad said, adding that the more on-line submission of documents and on-line payment become popular, the possibility of corruption wanes. On the other hand, it has made information available to business people as well as common people. As a result, people do not need to move for information on like getting passports and National Identity Cards (NID), she added. In financial inclusion and introducing digital payment gateway, mobile financial services have achieved a remarkable feat. As of August, there are 2.96 crore active account holders with an average daily transaction of Tk1,109.65 crore in the economy. A total of 18 private commercial banks are providing the services through their 850,363 agents. On top of that, access to Internet has seen a significant rise in last few years, with current 90.50 million Internet subscribers. The number of mobile subscribers rose to 154.15 million as of August. Strength of Bangladesh is the growing number of ICT based freelancers. According to a study conducted by Oxford University, UK, Bangladesh is now home to around 16.8% of all outsourced online workers in the world, a rate that is second only to India, at 24.6%. As many as 18,434 government offices including 58 ministries or divisions, 240 government departments and 64 DC offices of the country are now connected with an integrated network. Meanwhile, Bangladesh government is establishing Software Technology Park including Bangabandhu Hi-Tech City, Bangabandhu Sheikh Mujib Hi-Tech Park, Rajshahi, Sheikh Hasina Software Technology Park in Jessore, Sheikh Kamal IT Training and Incubation Center and CUET IT Business Incubator. The progress in the ICT adoption is praiseworthy. In maintaining the progress momentum in future, it is very important for Bangladesh to focus on information technology with more capital, targeting to bring more services under the ICT coverage.

ICT ADOPTION SCORE		
Country	Score out of 100	Global ranking
Nepal	40.50	101
Bangladesh	40.00	102
Sri Lanka	32.90	109
India	28.00	117
Pakistan	23.60	127

Source: Global Competitiveness Index 2018

UAE TRA Hosts Over 15,000 Visitors at Gitex

UAE's Telecommunications Regulatory Authority (TRA) concluded its participation in the 38th edition of Gitex Technology Week registering well over 15,000 visitors to its pavilion. The TRA's pavilion showcased a range of innovative information and communication technologies (ICT) projects and initiatives that TRA uses to facilitate the creation of an advanced and secure digital community in the UAE. The visitors, as analyzed by a hi-tech sensor system developed by the TRA, included 52 percent males and 48 percent females with the maximum influx of visitors recorded between 2 pm to 3 pm each day. The TRA also signed several significant memorandums of understating (MoUs) with global ICT and professional service companies and government entities during the event. Hamad Obaid Al Mansoori, Director General of the TRA, said: "We are very pleased with the overwhelming response that we got at Gitex. The participation in this edition was aimed at familiarizing visitors with TRA's contributions towards national smart transformation drive along with fostering partnerships with local government

and global entities in the field of ICT. We wanted to bring to the forefront the efforts we make on a regular basis and our future plans, to help create a sustainable and secure digital community within the UAE." "Gitex 2018 has opened up new horizons for the future with artificial intelligence and the fourth industrial revolution. This will enable us to accelerate the digital

transformation march, with sophisticated infrastructure and ambitious strategies that are designed to create a happy society," he added. The TRA was part of 21 federal entities at Gitex, under the umbrella of the UAE mGovernment, showcasing their achievements in using technology to facilitate provision of government services and achieve customer happiness.



Pakistan Set to Witness New IT Revolution

Experts have predicted that Pakistan will be undergoing an Information Technology (IT) revolution after which the Pakistani market would witness a new revolution. They told a media workshop that though the Safe City Project (SCP), Islamabad and Lahore have done wonders to bring the crime rate to an unprecedented low and a lot more is due to take place in the IT field. They said that the world will see an uprise of 40 billion personal smart devices, and 90 per cent of device users will have a smart digital assistant. Data utilization

will reach 86 per cent whereas, Atlas Intelligent (AI) services will be as prevalent as the air we breathe. The AI has become a new general-purpose technology which is set to change all industries and organizations on the planet. Huawei Enterprise Business Group Vice President (VP) and Managing Director (MD) Alaa El Shimy while speaking at the region's largest technology exhibition, GITEX, said "AI is on the verge of transforming industries and organizations across the world and we are committed to helping our

customers and partners make the most of the technology's potential to unlock innovation and economic growth". He said that right now the priority for industry and government leaders is to discuss the challenges and opportunities that AI can most immediately address in order to convert this cutting-edge technology into profitability for organizations. "This AI conference will help us, and regional governments, succeed in our mission to position the Middle East for success in the age of AI," he added. 📍

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ARTICLE

Network of the Future

Dynamically Sliced, Differentially Priced



Manish Singh

VP of Network Services Strategy & Marketing
Tech Mahindra

Tech
Mahindra

Digital Transformation is reshaping almost every industry, heralding unprecedented opportunities and challenges for each vertical. Digital continues to shape the new marketplace as brick-and-mortar gives way to e-commerce, structured industries yield to uberization and content goes over the top. Disrupt or be disrupted, is the mantra of this Digital marketplace. And 5G is about hypercharge this Digital Transformation.

5G will be the transformational tipping point that will deliver unprecedented productivity gains, redefine competitive advantages and accelerate global market reach reshaping every industry vertical.

5G will be the transformational tipping point that will deliver unprecedented productivity gains, redefine competitive advantages and accelerate global market reach reshaping every industry vertical (including agriculture, automotive, healthcare, manufacturing, energy, transport, gaming, media & entertainment etc.). Businesses will reexamine their P&L with a 5G lens. Network will become the differentiator that will redefine business processes, foster business innovation and pioneer new production, distribution and consumption models. Those who prepare well for 5G have much to gain and will be the disruptors. Others run the risk of being disrupted.

5G Use Cases

To meet the diverse Digital requirements of different industry verticals, 5G use-cases are broadly classified into three buckets: eMBB (Enhanced Mobile Broadband), MIIoT (Massive IoT) and uRLLC (Ultra-Reliable Low Latency Communication). Each with different set of requirements for the network:

- eMBB: requires ultra-high bandwidth, low latency to deliver enhanced user experience on mobile devices and to enable new immersive experiences like AR/VR. Lowering cost-per-bit is a major driver to continually meet the latent consumer demand for more and more data.

- **MIoT:** requires low-bandwidth and even low data rates to connect massive number of sensors, but must support extended battery life of sensors that will power Smart Homes, Smart Stadiums, Smart Industries, Smart Cities and more.
- **uRLLC:** requires ultra-reliable, ultra-low latency, high bandwidth to enable new applications like Autonomous Vehicles, Telemedicine, Precision Manufacturing Robots and more.

Following three network KPIs (Key Performance Indicators) succinctly capture the use cases' diverging requirements:

- eMBB requires peak 10Gbps and average 1Gbps data rates,
- MIoT requires 1M devices/km² connection density, and
- uRLLC requires 1ms latency.

5G must solve delivering one network that can meet all these diverging requirements

5 Laws shaping 5G

5G has to solve for delivering one network that meets all the aforementioned diverging requirements. Following are the five laws that are fundamentally shaping the 5G network:

- 1. LAW OF PHYSICS:** Nothing travels faster than the speed of light ($c \sim 3 \times 10^8$ m/s). Today, applications hosted in the Cloud typically deal with ~100ms network latency. 5G is targeting to enable ultra-low latency applications that need <10ms latency. The only way this network latency requirement can be realized is by bringing both the network and the end application closer to the UE. Edge Computing (MEC) and Control-User Plane Separation (CUPS) in 5G will be pivotal in enabling these ultra-low latency applications.
- 2. MOORE'S LAW:** Compute (actually transistors) density doubles every two years, creating ever hungrier devices/things and more processing power for the network infrastructure. Apple's A11 processors have six ARM cores and Intel's latest Xeon processors, Purley, have up to 28 x86 cores. Devices will exponentially demand more and more data. And 5G network too will greatly benefit with the growing infrastructure compute capacity, enabling sophisticated, real-time complex algorithms. MU-MIMO,

Beamforming, Beam tracking etc. will all be beneficiaries of Moore's Law in 5G, paving way for leveraging smart antenna techniques to deploy higher spectrum bands. Increases in compute capacity will enable processing 100MHz wide channel bandwidth in 5G and in handling 1Gbps average data rate. If partitioned right, Telco Cloud can even beat Moore's Law.

Devices will exponentially demand more and more data. And 5G network too will greatly benefit with the growing infrastructure compute capacity, enabling sophisticated, real-time complex algorithms.

- 3. LAW OF THE LAND:** Regulatory frameworks across different countries will significantly shape 5G. Net neutrality is back at the forefront and will pave the way for how 5G networks will be dynamically sliced and differentially priced. Spectrum licensing regimes will shape how 5G networks will be rolled out. Licensed, unlicensed and even shared spectrum regimes will shape both CSP 5G networks as well as Private 5G Networks. Furthermore, licensing regimes need to be harmonized; for ex: 60GHz today is unlicensed in US, but licensed in India. Policymakers will have to collaborate to harmonize spectrum bands to preserve the economies of scale and facilitate cross-border roaming for mobile users. Lastly, as applications gets hosted at the network edge, data privacy regulations like GDPR will become increasingly relevant for 5G networks.
- 4. LAWS OF ECONOMICS:** Production precedes consumption; production has costs while consumption is the ultimate goal. 5G network rollout will incur significant CapEx and OpEx spend from CSPs. Which applications, which industry verticals, which use-cases will drive new monetization opportunities remains uncertain in the short term. Dynamic Network Slicing in 5G networks will provide the essential flexibility

to CSPs to deal with uncertainty and balance network Demand-Supply in this brave new Digital world of fail-fast and scale-fast.

- 5. LAWS OF THE CLOUD:** Nothing is shaping 5G more than the principles of Cloud. Cloud has clearly established the power of centralization with unprecedented economies of scale. Scale matters and best of breed wins in the world of Cloud. On demand, self-service/DIY is the established Cloud operating model. Disaggregation of Network Functions (NF) and SDN/NFV are the bedrock foundations of the Network of the Future. Both Core and Access Networks will be virtualized in 5G and will form the essential building blocks for Network Slicing. 5G gives CSPs the unique opportunity to break traditional vendor lock-in and build their networks with best-of-breed solutions. Stovepiped back office functions will yield to Dynamic Orchestration. Self-Service/DIY, On-Demand operating model will holistically require a new approach to traditional BSS/OSS back office functions.

Dynamic Network Slicing in 5G networks will provide the essential flexibility to CSPs to deal with uncertainty and balance network Demand-Supply in this brave new Digital world of fail-fast and scale-fast.

5G Infrastructure: A Distributed Telco Cloud

Networks are inherently hierarchical and distributed in nature. 5G Infrastructure will be a Distributed Telco Cloud built by leveraging merchant silicon, COTS hardware and Cloud OS. Network Functions (NFs) themselves will be disaggregated, virtualized, will be truly cloud native and deployed as workloads on the Telco Cloud. Decoupling NFs from the underlying infrastructure enables them to be orchestrated and dynamically placed at different locations of the Telco Cloud, thereby, enabling creation of logically

independent network slices on a shared infrastructure. This in turn enables CSPs to create multiple logical network slices that best meet the varying requirements of bandwidth, connection density, latency, elasticity and cost. The distributed infrastructure will further enable CSPs to host NFs as well as 3rd party applications from different industry vertical in a way that best meet both the technical and business requirements. Edge Cloud in particular will bring compute and storage capabilities closer to the end device/thing (UE) and will be critical for meeting the requirements of ultra-low latency applications and for efficiently managing ultra-high bandwidth applications.

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A three tier Distributed Telco Cloud Architecture can vary depending on CSP's existing infrastructure, geographic footprint and end application requirements. Distributed Telco Cloud will enable CSPs to achieve the Cloud-like economies of scale and simultaneously balance stringent requirements like ultra-low latency. The Distributed Telco Cloud operating model will be: "Centralize what you can. Distribute only what you must".

5G Network

5G is changing the network's anatomy to enable CSPs to offer wide range of Digital Services. Historically, appliance centric networks were engineered to meet the requirements of limited set of services like voice, messaging, data and video. These networks however have proven to be inflexible to meet the diverse and varying requirements of Digital Services. As we move past the era of limited killer-apps to an era of diverse Digital Services, 5G

is holistically redefining the network end-to-end, including both the Access and the Core Network.

5G AN: Access Network

To meet the diverging needs of eMBB, MIoT and uRLLC use cases, 5G AN (Access Network) will be dis-aggregated and virtualized. To meet the ultra-high throughput and ultra-low latency requirements, 5G NR (New Radio) will operate in diverse spectrum bands spanning across low, mid and high spectrum bands. To deliver average 1Gbps data rates and to solve for the cell edge problem, 5G AN will employ advanced phased antenna array technologies including MU-MIMO and Beamforming.

In the world of Cloud, best-of-breed has already won. With 5G, CSPs now have the opportunity to dis-aggregate and virtualize the RAN (vRAN) and pave the way for best-of-breed 5G AN solution. Leveraging the vibrant eco-system of vBBU, RRH, AAS, SON and COTS white-box suppliers, CSPs can drive margin stacking out of their supply chain and break the large OEM's vendor lock-in on their RAN. Benefits of vRAN go well beyond the equipment cost, as it greatly simplifies/reduces the RAN site deployment cost and significantly reduces OpEx by driving energy and cooling costs down at the Base Station (BS) sites. vRAN further provides added benefits of energy management, dynamic network scaling and high availability, all of which will be key requirements for 5G.

5G splits the gNodeB architecture into Centralized Unit (CU), Distributed Unit (DU) and the Radio Unit (RU). The architecture offers various options for splitting the gNB stack across real-time and non-real time functions of the RAN. The split choice would depend on a number of factors including underlying transport network, spectrum channel bandwidth, fronthaul bandwidth requirements, connection density and latency tolerance. Above all, vRAN will enable end-to-end network slicing in 5G network.

5G NR (New Radio) will enable operators to tap into mmWave spectrum bands, above 24GHz, to create fat OTA (over the air) pipes. Ample spectrum available in

these mmWave bands, facilitate CSPs to create network that will deliver ultra-high throughput and ultra-low latency. However, use of these higher spectrum bands have their own set of challenges including high propagation loss, required line-of-sight (LoS) and high susceptibility to signal blocking. Challenges span across both indoor and outdoor environments as typically these signals cannot even penetrate walls and can easily be blocked by foliage or even moving vehicles in urban environment. Deploying in mmWave bands necessitates sites to be in close proximity. Poles and other street furniture provide ideal deployment sites as these bands would be best suited for dense urban population areas that need massive capacity boost. Advanced antenna techniques including beamforming and beam tracking will be employed for mobilizing mmWave in non-line-of-sight environments. In addition to mmWave, CSPs will also employ diverse spectrum assets below 6GHz and even below 1GHz to provide ubiquitous 5G coverage. Balancing traffic demand against deployment costs will govern how CSPs acquire and deploy their spectrum assets to create adequate coverage and capacity for their 5G network nationwide.

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5G Core Network

5G Core will be truly cloud-native, deployed on a Distributed Telco Cloud infrastructure, delivering unprecedented Service Agility. SDN and NFV are the foundational pillars of the 5G Core Network. For the very first time, 3GPP has specified Service Based Architecture for 5G Core, in addition to the traditional Reference Point Architecture

(used in 2G, 3G, 4G and now 5G). Service Based Architecture holds the key to rapidly enabling wide range of Digital Services with varying requirements from different industry verticals.

5G Core will be composed of self-contained reusable software modules of network function services. This modularity enables dynamic composition of different network cores on a per slice basis, with varying capabilities, that best meet the end service requirements.

Existing mobile core networks have only one set of logical control functions and this in turn has artificially limited the service set that CSPs can offer to their customers. If a new service introduction required modifying an existing network function or introducing new network function(s), then CSPs had to undertake the complex task of integrating and retesting their entire core network end-to-end and would typically take anywhere from six to eighteen months – this will no longer work in the Digital Services era. This architectural rigidity has fundamentally inhibited CSPs to rapidly offer new services and efficiently seize market opportunities. In sharp contrast, web-scalers have demonstrated rapid service introduction and elastic scaling capabilities. Service Based Architecture brings that cloud agility to the 5G Core Network. Different Network Functions can be quickly composed and orchestrated into a new end-to-end service making it easier to add, modify or remove NFs from service chains and even quickly realize new service chains.

Just like microservices interact to create complex cloud applications, 5G Core will be composed of self-contained reusable software modules of network function services. This modularity enables dynamic composition of different network cores on a per slice basis, with varying capabilities, that best meet the end service requirements. Also like cloud application,

5G core network functions will mostly be stateless decoupling the compute and storage resources which in turn enables faster scale-out, flexible NF placement and new software enabled redundancy models for high availability and geo-redundancy. Minimizing state will be a key challenge for 5G NFs and key is to keep stateful services to a minimum.

Cloud native, Service Based 5G Core lends itself very well for Network Slicing by allowing reuse of network function services and even rapid network function customization, as needed, across slices. In addition to the traditional core network functions like authentication, session management and mobility management, 5G Core introduces new functions like Network Slice Selection Function (NSSF), NF Repository Function (NRF) and Network Exposure Function (NEF) to support cloud native Core and Network Slicing. NRF maintains NF repository enabling registration and discovery of cloud native NFs for cloud-like operations. NEF is like an API Gateway, allowing external users to define and enforce policies per their end application requirements. NEF is particularly important to enable Digital Services for diverse industry verticals and enable cloud like Self-Service/DIY operational models. NSSF enables Network Slicing by assisting selection of the right Network Slice instance, in a multi-sliced core, that best meet service specific requirements.

An important aspect of the cloud native 5G Core is the separation of Control and User Plane functions. Web-scalers have used similar architectures to efficiently scale their cloud applications with centralized control and distributed processing to efficiently scale sessions and transactions. Control and User Plane Separation (CUPS) in 5G Core will enable independent scaling and evolution of control plane and user plane functions. Architecturally this will enable networks to efficiently scale and respond to data tsunamis and/or signaling storms, as the case maybe. Furthermore, this will enable flexible deployment of user plane functions at regional or edge clouds to optimally meet the high throughput and low latency requirements of the end application.

5G Core will be Access agnostic. This will enable CSPs to deploy a converged core network which will integrate both 3GPP ANs (like 5G NR, 4G LTE) as well as non-3GPP Access Network (like WiFi).

Network Slicing

Network of the Future will be dynamically sliced and differentially priced.

Network Slicing will enable CSPs to create different logical networks, on a shared Telco Cloud infrastructure, with varying capabilities that best meet the varying requirements of different applications. Throughput, latency, security, mobility requirements can all vary from application to application. Furthermore, economic models across eMBB, MIIoT and uRLLC will greatly vary and in turn will put varying demands on the network.

Harnessing the power of Virtualized RAN (vRAN) and cloud native Core, 5G network can dynamically allocate resources and generate network topologies with the right set of NFs (Network Functions) that best meet the end service requirement. Resources can be dedicated or shared across slices. A slice itself can support one or many services.

To enable cloud-like On-Demand, Self-Service/DIY models for different industry verticals, Network Slicing will pave the way for CSPs to offer differentiated services at differential price points. CSP can offer network slices with varying throughput, latency, mobility, security etc. to the end user and can even offer varying levels of granular control for the slice.

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In a nutshell, Network Slicing can be summed up as the network adapting itself in software to deliver optimal network topology capability and resources that best meet the end service requirements. To illustrate the adapting capabilities of a 5G network, let's take three different use cases with three different service requirements:

Network Slicing can be summed up as the network adapting itself in software to deliver optimal network topology capability and resources that best meet the end service requirements.

1. Virtual Reality (VR): This use case can be classified under eMBB service which requires high throughput and low latency. To optimally meet these requirements, the network slice would take advantage of CUPS and place Core User Plane (UP) function at the local DC, closer to the end device to optimize latency. Further, 3rd party Gaming Applications and VR Acceleration engines can be hosted and integrated to further optimize service delivery. To meet the high throughput requirements, 5G AN would employ advanced antenna techniques like MU-MIMO and beamforming.

2. Autonomous Car: This use case requires

uRLLC service to meet the stringent ultra-low latency and high throughput requirements. To meet these stringent requirements, the slice would deploy both real-time and non-real-time functions of the 5G AN as well as the 5G Core UP right at the Central Office (CO) Edge Cloud; bringing them closest to the end device. Network would leverage multi-mode AN connectivity to meet high reliability and high throughput requirements. Further, 3rd party autonomous car V2X server can be hosted at the CO Telco Cloud to reduce the application latency even further.

3. IoT Sensors: This use case requires MIoT service to meet the low bandwidth and long battery life requirements. These sensors would mostly be static (low mobility) and largely generate small volume of uplink data periodically. The economics of this market are going to be ultra-low ARPU. Aligned with the principle of "Centralize what you can. Distribute only what you must", this network slice would deploy all the network functions in the centralized Hyperscale Telco Cloud. CSPs can also host 3rd party IoT servers on their infrastructure and even go up the value chain by offering Managed Digital Services.

End-to-End Network Function Disaggregation and Virtualization (of both Access and Core Networks) are the fundamental building blocks of this adaptable and sliceable 5G Network. Ergo Network Slicing necessitates utmost diligence in selecting best-of-breed NFs to achieve highest levels of Service Agility.

5G Rollout

Barring an unforeseen Greenfield operator, 5G will be rolled out in phases. 3GPP

standardized Non-Standalone (NSA) mode in December 2017, and in June 2018 3GPP released the standards for Standalone mode (SA) as well.

Most of the 5G trials and early rollouts will be deployed in Non-Standalone mode leveraging 4G LTE Core and RAN for ubiquitous coverage and 5G NR selectively deployed to boost capacity and data rates. This provides the fastest path for CSPs to launch 5G commercial services. Non-Standalone mode is also currently being used by CSPs to study and characterize RF Propagation characteristics of mmWave spectrum band.

Eventually, to reap the full benefits of 5G, CSPs will migrate to Standalone mode. Enabling wide range of Digital Services will require CSPs to deploy 5G Core Network and automate end-to-end Network Slicing. Progressive CSPs have already initiated deploying their Telco Cloud, LTE vRAN and Virtualizing their 4G EPC. Further, they are also deploying CUPS in their 4G EPC, paving the way for 5G Network and simultaneously minimizing stranded investments. 📍

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Manish Singh is a well-respected industry leader with over 20 years of experience, specializing in Wireless Networks. He is Tech Mahindra's primary liaison to ON.Lab for R-CORD program.

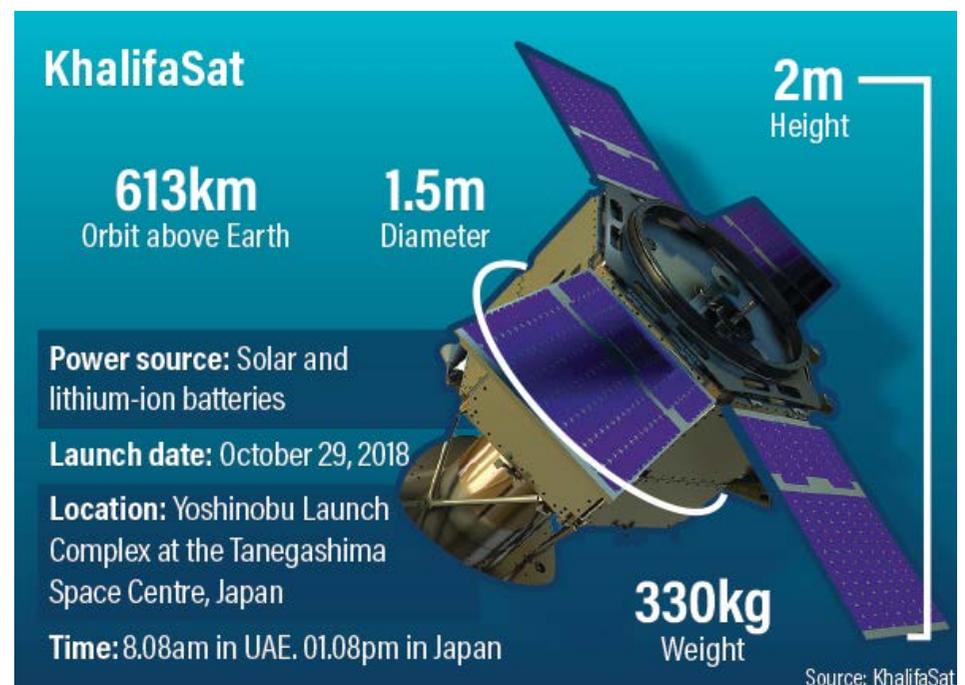
SATELLITE NEWS

UAE's KhalifaSat Successfully Reaches Orbit

Marking a new milestone that adds to the UAE's achievements and a new phase in the development of the national space sector, the Mohammed bin Rashid Space Centre, MBRSC, announced the successful launch of the Emirati satellite KhalifaSat into orbit. KhalifaSat is the first Emirati satellite to be 100 percent developed at the facilities of MBRSC in the UAE by Emirati engineers. One of the most advanced earth observation satellites, KhalifaSat was launched from the Tanegashima Space Centre in Japan, aboard the H-IIA rocket at 1:08 pm Japan time (8:08 am UAE time). H.H. Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai, Chairman of Dubai Executive Council and MBRSC Chairman followed the first contact made by the satellite with the ground station at the Centre. Sheikh Hamdan congratulated President His Highness Sheikh Khalifa bin Zayed Al Nahyan, His Highness Sheikh Mohammed bin Rashid Al Maktoum, the Vice President, Prime Minister and Ruler of Dubai, His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, and the entire nation on this achievement. The Dubai Crown Prince said that this accomplishment is another milestone in securing a bright future for the nation. He noted the UAE has all the assets required to achieve excellence in advanced sciences. Sheikh Hamdan added, "Today, we celebrate a significant national achievement. This project has been 100 percent developed by Emiratis. The UAE is a key partner in the global efforts to make the world a happier and better place through scientific advances. We thank the team that launched KhalifaSat and encourage them to work harder to bring more achievements to this great nation." The launch of KhalifaSat was attended by Dr. Ahmad bin Abdullah Humaid Belhoul Al Falasi, Cabinet Member, Minister of State for Higher Education and Advanced Skills and Chairman of the Board of Directors of the UAE Space Agency;

Hamad Obaid Al Mansoori, Chairman of MBRSC; Khalid Al Ameri, UAE Ambassador to Japan; Yousuf Hamad Al Shaibani, Director-General of MBRSC; Dr. Mohammed Nasser Al Ahbabi, Director-General of the UAE Space Agency, and Salem Humaid Al Marri, Assistant Director-General for Scientific and Technical Affairs at MBRSC KhalifaSat entered into a low earth orbit at an altitude of approximately 613 kilometers at 9:33 AM, 85 minutes after its launch. The first signal was successfully received at the ground station at the Mohammed bin Rashid Space Centre. At a later stage, KhalifaSat will capture and deliver high-quality detailed images of Earth to the ground station at MBRSC, Dubai. At 70cm per pixel panchromatic and 2.98 metres per pixel in multi-spectrum, KhalifaSat can provide images that meet the highest international standards. These detailed high-resolution images can help government and private sector organisations get accurate data for monitoring environmental changes, detecting the effects of global warming, ensuring responsible urban planning and management, and aiding relief efforts at

times of natural disasters. These images can also support the effort to achieve sustainable development goals and improve the quality of life. KhalifaSat is two metres high and weighs only 330 kg. Its speed is estimated at 7km/s, which enables it to orbit the Earth almost 14 and a half cycles daily. It has bagged five patents and developed seven space innovations that have given the satellite an enhanced digital camera; fast image download and high-speed communication capabilities from its position anywhere above the world; an automatic satellite control system with increased storage capacity; a satellite positioning technique that allows it to simultaneously capture multiple 3D images; as well as advanced target positioning for capturing high quality images with pinpoint accuracy and high speed. Hamad Obaid Al Mansoori said, "We are proud of the successful launch of KhalifaSat, which bears the name of His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE. Launching this satellite during the Year of Zayed emphasises the determination of Emiratis to achieve the vision of the late Sheikh



Zayed bin Sultan Al Nahyan, who believed that building a nation begins with investing in its people who are the foundation of any development and real progress. His legacy is continued through the wise leadership of His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE; His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai; and His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces. We are guided by the vision of our leadership to make the UAE one of the best countries in the world. We are honoured to reflect this vision in our projects and achievements and today's success cements MBRSC's contribution to the UAE's advancement and leadership in developing satellites." KhalifaSat contains an advanced positioning system that allows a large number of 3D images to be captured at once, with excellent accuracy and speed. The images will be used to monitor environmental changes and the impact of global warming, effectively manage urban planning, and support relief efforts during natural disasters. It also has a large storage capacity and ability to download images and data at high speed, allowing more images to be captured in less time. Commenting on the launch, Yousuf Al Shaibani said, "We dedicate this

new Emirati achievement to our wise leadership who believes in the capabilities of young Emirati men and women. The leadership has provided them with all the necessary resources to design and build the first Emirati satellite at the Mohammed bin Rashid Space Centre. We also dedicate this achievement to His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and President of the Mohammed bin Rashid Space Centre, who closely monitored the progress of the design and launch of KhalifaSat. His support and encouragement were instrumental in unleashing the capabilities of the team that built one of the most advanced satellites. KhalifaSat is another milestone in the UAE's space journey and its programme to develop space technologies and sciences." KhalifaSat is the third satellite to be developed by MBRSC after DubaiSat-1 and DubaiSat-2. What distinguishes it from the first two satellites is that it is the first satellite to be fully developed by a team of highly qualified Emirati engineers. The hexagonally designed satellite is powered by four deployable solar panels attached to the sides of the satellite bus. There are two decks within the structure, as well as an upper sun shield made of a carbon fibre reinforced polymer (CFRP) that protects the sensitive camera system from temperature fluctuations and radiation.

Amer Al Sayegh said, "KhalifaSat has demonstrated that Emiratis are capable of enhancing the UAE's position as a global hub for the space industry. It has also proved the success of Mohammed bin Rashid Space Centre's strategy of preparing and training Emiratis to develop innovations. Their innovations have made KhalifaSat a pioneering satellite with exceptional advantages in terms of weight, image quality and clarity, and speed of downloading and analysing data. These features have made it one of the best in its category, and a real scientific and technological icon. I congratulate all the team members who have contributed to developing KhalifaSat and followed up on its successful launch. I also thank the management of Mohammed bin Rashid Space Centre for their unlimited support in all the stages of this major project." The MBRSC ground station in Dubai supports KhalifaSat and its functions from Earth. The ground system includes three main subsystems: Antenna and Radio Frequency (RF) subsystem, Mission Control Station (MCS), and Image Receiving and Processing Station (IRPS). The main function of the Antenna & RF subsystem is to transmit imaging orders, give commands to the satellite, receive information and download images through the X-band feed.

Inmarsat Signs Agreements with Europe's leading Air Navigation Services Providers for Iris Program

Inmarsat, the world leader in global mobile satellite communications, has signed agreements with five major Air Navigation Services Providers (ANSPs) in support of the Iris program to modernize air traffic management (ATM) across Europe. DFS (Germany), ENAIRE (Spain), ENAV (Italy), EUROCONTROL MUAC (North-West Germany, Belgium, Luxembourg and the Netherlands) and NATS (UK), who together handle the majority of European air traffic, will join an Initial Operational Capability (IOC) pilot, marking a significant milestone

for the early implementation phase of Iris. Separately, Inmarsat has also signed a contract with European Satellite Services Provider (ESSP), a company owned by European ANSPs and focused on safety of life services, in accordance with International Civil Aviation Organization (ICAO) standards. ESSP will work with Inmarsat to help define the service and certification framework of the future Iris Service Provider, a company that will be appointed under the program to provide the European datalink communication services

for Iris. The Iris program is a partnership with the European Space Agency (ESA) and led by Inmarsat to enable secure, high bandwidth datalink communications over Europe. The objective is to deploy more digital controller-pilot communications to improve the speed and accuracy of air traffic management across Europe's congested airspace. ANSPs will be able to rely on Iris' certified, efficient and sustainable datalink to increase ATM efficiency, relieve air traffic controller workload and enhance flight safety.

Drone Industry Welcomes World's First Ever Drone Standards

The first ever worldwide Standards for the drone industry are being released by the International Standards Organization (ISO). The new, long awaited Standards have been developed after several years of global collaboration between standards institutions from across the world and are expected to trigger rapid acceleration of growth within the drone industry as organizations throughout the world are galvanized to adopt drone technology against a new background of reassurance on safety and security. The new Standards will play an essential role in guiding how drones are used safely and effectively in a framework of regulatory compliance. The ISO Draft International Standards for Drone Operations are formally released today for public consultation, with drone professionals, academics, businesses and the general public being invited to submit comments by 21 Jan 2019 with final adoption of these Standards expected in the US, UK and worldwide in 2019. Announcement by ISO is the first important step in the standardization of the global drone industry, encompassing applications for all environments - Surface, Underwater, Air and Space. The first drone Standards, announced today, are particularly significant for the general public and Government, in that they address Operational Requirements of the more recognized and prevalent aerial drones, including protocols on Safety, Security and overall 'Etiquette' for the use of drones, which will shape regulation and legislation going forward. They are the first in a four part series for aerial drones, with the next three addressing General Specifications, Manufacturing Quality and

Unmanned Traffic Management (UTM). A prime characteristic of the ISO Standards announced today, is their focus on air safety, which is at the forefront of public attention in connection with airports and other sensitive locations. The new Standards act as a new 'etiquette' for drones which promote and reinforce compliance regarding no-fly zones, local regulation, flight log protocols, maintenance, training and flight planning documentation. Social responsibility is also at the heart of the Standards, strengthening the responsible use of a technology that aims to improve and not obstruct everyday life. The effectiveness of the Standards in improving air safety will be further strengthened by the rapid development of geo-fencing, providing frontline protection against 'rogue' drone use. The Standards are also set to address public concerns surrounding privacy and data protection, demanding that operators must have appropriate systems to handle data alongside communications and control planning when flying. The hardware and software of all related operating equipment must also be kept

up to date. Significantly, the fail-safe of human intervention is required for all drone flights, including autonomous operations, ensuring that drone operators are accountable. Empowered by Standards, drones are set to provide the key to some of the most pressing economic, transport, security, environmental and productivity challenges faced by governments and industry throughout the world, reducing road traffic, easing congestion, saving lives through a reduction in accidents and reducing pollution in our cities. New exciting applications for drones are being developed daily. In particular revolutionary approaches are emerging for freight and passenger transportation, with drones providing a cost-effective and environmentally responsible alternative to traditional methods, relieving the burden on our already stretched road traffic system. Further applications in the agricultural, maritime, construction and energy sectors, among others, are already transforming businesses, with all industries and business sectors set to benefit from the Standards-led adoption of drone technology.



Kacific-1 Satellite Enters Testing Ahead of 2019 Launch

Vanuatu-registered Kacific disclosed on its website that its Kacific-1 satellite has begun a testing phase ahead of an expected launch next year. The next-generation satellite – which will provide high speed, low-cost broadband services to Pacific nations – is undergoing testing and integration of its electronic communications systems and satellite

platform including power and propulsion systems. The communications antennas are being prepared for range tests starting in the next few weeks. Kacific has recently recruited additional sales representatives to establish more service provider relationships to grow its broadband capacity business in Asia, Melanesia, Micronesia and Polynesia. Alongside

Vanuatu, other Pacific nations that have been lined up to receive broadband capacity from Kacific include Kiribati, Tuvalu, Solomon Islands, the Federated States of Micronesia, Samoa, Fiji, the Marshall Islands, Papua New Guinea, Nauru, Tonga, Tokelau and others.

Arianespace Vega Launches Second Moroccan Earth-Observation Satellite

An Arianespace Vega rocket launched the Mohammed 6-B satellite for Morocco the evening of November 20, placing the satellite in the same orbit as its twin satellite Mohammed 6-A that launched a year ago, also on a Vega rocket. Eastern from the European spaceport in French Guiana on the northern coast of South America. The 1,100-kilogram satellite separated from the rocket in low Earth orbit about 55 minutes later. The launch completes Morocco's two-satellite constellation for Earth observation. The country plans to use the satellites for purposes including land mapping, natural-disaster prevention and management, environmental monitoring and border surveillance. The Mohammed 6-B launch is Arianespace's ninth mission of the year and second with the light-lift Vega rocket. Airbus Defence and Space built the satellite platform while Thales Alenia Space supplied the payload and the ground segment for image processing. Vega now has a track record of 13 launches, all of which have been successful. Vega will not have any more

missions this year due to delays earlier this year with the European Space Agency's wind-mapping Aeolus satellite. Giulio Ranzo, CEO of Avio, the manufacturer of Vega rockets, said the delay of Aeolus from March to August pushed out a third Vega mission to next year. "The schedule moved due to customer issues," he said

in an interview. Vega's next launch will be in late January or early February for the Italian Space Agency, Ranzo said. Arianespace's next launch is of an Ariane 5 rocket in December with the Indian space agency's GSAT-11 telecom satellite and the Korean Aerospace Research Institute's GEO-Kompsat-2A weather satellite.



VT iDirect Joins ESA SATis5 Consortium to Help Drive Integration of 5G and Satellite Networks

VT iDirect, a company of VT Systems, today announced it has joined SATis5, a consortium funded by the European Space Agency (ESA) to promote the cost-effective integration of satellite technology into 5G networks. Together with the consortium members, VT iDirect's solutions group, based in Killarney Ireland, will drive technology innovation aimed at opening market opportunities for 5G-based connectivity services. Additionally, VT iDirect will be leading the research and development of an end-to-end system to support multi-orbit geostationary equatorial orbit (GEO) and non-GEO satellite integration as part of the 5G architecture with focus on both enhanced mobile broadband (eMBB) and massive Machine Type Communications (mMTC)

Internet of Things (mIoT) usage scenarios. The SATis5 consortium members, VT iDirect, SES and Fraunhofer FOKUS, recently partnered to showcase a live Satellite-5G test bed at the FOKUS FUSECO Forum 2018 event in Berlin, Germany on Nov. 15-16. The companies showed how satellite connectivity could integrate into a 3rd Generation Partnership Project (3GPP) network architecture, comprising a Software-Defined Networking (SDN), Network Functions Virtualization (NFV), and Multi-access Edge Computing (MEC)-enabled 5G testbed. The successful test leveraged iDirect modems, satellite hub and 3GPP-enabled core network, with SES's geostationary satellite Astra 2F. The Consortium also showcased efficient edge delivery and network slicing of eMBB

and mMTC over satellite building upon the Fraunhofer FOKUS' Open5G Core network as a Proof-of-Concept for their integration into a full 5G architecture. "The goal of SATis5 is to foster industry collaboration in using satellite technology for the future 5G connected world," said Richard Lord, Vice President, Engineering, Strategic Initiatives, VT iDirect. "SATis5 is helping to drive major milestones and deliverables led by key innovators across the satellite and telecom industries. This is critically important work that will help service providers extend their global reach, penetrate significant new markets, and shape the future of how the world connects."

SPOT Satellite GPS Messaging Devices Surpass One Billion Messages Transmitted, 6,100 Rescues Worldwide

Globalstar Europe Satellite Services Ltd., a wholly owned subsidiary of Globalstar, Inc. (NYSE American: GSAT) and a leading provider of satellite messaging and emergency notification technologies, today announced that SPOT has reached a new milestone, surpassing one billion messages transmitted and more than 6,100 rescue incidents initiated in 89 countries and on six continents. A trusted and proven satellite communications family of devices, SPOT's fast-growing base of subscribers includes lone workers and outdoor enthusiasts who want peace of mind, reliable communications and SOS capability through the GEOS International Emergency Response Coordination Center (IERCC), even when there is no mobile network coverage. To date there have been a total of 311 rescues in EMEA, with 258 in Europe and 53 in Africa. France (32), Italy (17), Norway (32), Sweden (27), Switzerland (25), Spain (32) and the UK (44) are the busiest rescue locations in Europe. Adventurers who are hiking, mountain climbing and paragliding in Europe and Africa are most likely to request help

from the GEOS International Emergency Response Co-Ordination Centre (IERCC) via SPOT's SOS button. One rescue last winter in Europe was Kjell-Harald Myrseth. He was on a 500km trek using skis, sleds and dogs inside the Arctic Circle in Norway when a deadly storm developed with winds of up to 240km/hr. The snow caves he kept building for protection all collapsed within hours, so he pressed the SOS button on his SPOT Gen3. Helicopters and snowmobiles were unable to venture out in the extreme conditions so Kjell lay by his sled in a sleeping bag and focused on keeping hypothermia at bay. His body temperature had dropped and he had barely slept for 60 hours when the search and rescue team took advantage of a slight drop in the wind to reach his GPS location. "SPOT saved my life. It's a no-brainer for anyone in the wilderness," said Kjell. In April 2018, another user, Markus Huber was paragliding with a friend in Switzerland when he hit a patch of turbulent air, which caused his paraglider to suddenly collapse on one side. Markus deployed his reserve parachute, bailed out

and seconds later was hanging 20 meters up in a tree. Markus pressed the SOS button on his SPOT to initiate a rescue. "Thanks to SPOT, in an instant, IERCC and both of my children were notified of my incident and had my precise location so they could organize a rescue. SPOT is an essential piece of kit. It's obvious to invest in a device that allows my loved ones to find me in an emergency. It makes paragliding much safer." "For more than a decade we have dedicated ourselves to bringing affordable communication technology to our customers to provide peace of mind to their loved ones regardless of the mobile network," said David Kagan, CEO at Globalstar. "This billionth message milestone shows the breadth of our network and the increased demand of people around the world expecting to be able to communicate from wherever they are. We are incredibly proud of the work we have done to keep people connected and take great responsibility in being a reliable source of communication when an emergency strikes."

Future Military Satcom System Puts Cybersecurity First

Electronic threats against satellite communication have rapidly escalated in the last few years and will continue to advance in the foreseeable future, the Defense Science Board cautioned in a March 2017 report. Similar warnings appear in the Trump administration's 2018 national defense strategy: U.S. adversaries are developing electronic jammers and other cyber weapons that can render all commercial and most defense satellite communications inoperable. The Russian military, for instance, has fielded several types of mobile jammers to target specific satellite user terminals within tactical ranges, the Secure World Foundation reported. Russia also has deployed technology to jam communications satellite uplinks over a wide area from fixed ground stations. If a U.S. military satellite were jammed, the public likely would not hear about it, as such events are classified. Only one U.S. satellite communications network is said to be completely jam-proof, the Advanced Extremely High Frequency (AEHF) system the Air Force began deploying in 2010 to replace its legacy Milstar satellites. AEHF is a multi-billion-dollar constellation of four satellites projected to grow to six over the next two years. The newest satellite in the constellation, AEHF-4, Oct. 17 from Cape Canaveral Air Force Station, Florida, aboard a United Launch Alliance Atlas 5 rocket. U.S. Air Force Capt. Elizabeth Forbes, deputy of AEHF Launch Operations, and 1st Lt. Philip M.

Castillo of the Space and Missile Systems Center, prepare for the Oct. 17 launch of AEHF-4, a jam-proof satellite the Pentagon reserves for the most sensitive strategic communications. Due to growing cybersecurity concerns, the AEHF system is in high demand across the U.S. military. But the Pentagon reserves AEHF capacity for the most sensitive strategic communications — like nuclear command and control or planning air strikes — and wants to move tactical users to less expensive alternatives. The Defense Department has asked the Air Force to provide another option for tactical users that need jam-resistant satellite communications.



Liquid Telecom Partners with Kymeta to Deliver Enhanced Mobile Satellite Communications to Africa's Most Remote Locations

Leading pan-African telecoms group Liquid Telecom is extending its award-winning VSAT service through a new partnership with Kymeta, enabling it to deliver enhanced satellite mobile connectivity across Africa. As part of a master distribution agreement announced at AfricaCom 2018, Kymeta's lightweight, high throughput satellite communication systems will be integrated with Liquid Telecom's satellite connectivity. This will provide high-speed bandwidth mobile internet access to private and public-sector organizations that would normally have difficulty accessing reliable, affordable internet, particularly in remote locations. Quick and easy to deploy, this modern satellite connectivity has the potential to enable new service innovations



and transform society in the most under-served and remote parts of Africa. Mobile medicine or healthcare vehicles, for example, will be able to deliver screening and remote diagnostics to isolated communities across the continent. It can be used by aerospace, maritime and ground transport customers to create new services and connections across isolated areas. It can even support the growth of IoT capability across a range of vehicles to support a fully connected automotive future including self-driving cars. "This new strategic partnership between Liquid Telecom and Kymeta marks a disruptive moment in the evolution of VSAT services for the African continent," said Scott Mumford, Group Managing Executive, Satellite & VSAT, Liquid Telecom. "By pairing the latest Liquid VSAT internet platform with Kymeta's groundbreaking satellite terminals, the two companies are bringing unrivalled connection quality, speed and availability to people on the move and in places that have never been connected before. "This new satellite mobility partnership offers limitless opportunities for communication and collaboration in Africa," said Neville Meijers, Chief Commercial Officer, Kymeta. "This mass market broadband platform can be deployed quickly and easily without skilled personnel – delivering Gigabit connectivity instantly and anywhere. Applications of all types can benefit from this future-facing technology: from new digital IoT services in connected transport systems, to healthcare applications and education systems."

Inmarsat Enhances Cyber Security Offering for Maritime Industry

Inmarsat has introduced two new components to its maritime cyber security service, Fleet Secure, as it continues to develop solutions that combat ever-increasing cyber threats faced by ship owners and ship managers. Vessel operators will benefit from a powerful, multi-layered endpoint security solution, Fleet Secure Endpoint, which is based on industry leading technology from ESET, a world leader in digital security, and powered by Port-IT and protects desktop computers and other systems connected to a vessel's network. Fleet Secure Endpoint has been developed to remove infections and thwart hackers before damage occurs to onboard endpoints and connected systems. The solution will be available for commercial use from January 2019 and is compatible across Inmarsat's maritime portfolio of services, including Fleet Xpress,

FleetBroadband and Fleet One. It also complements the resilience of Inmarsat's own satellite and ground network enabling consistent cybersecurity standards to be maintained. Peter Broadhurst, SVP of Safety and Security for Inmarsat Maritime said: "It is a priority for every fleet operator and ship manager - shore-side and at sea - to ensure their systems are properly protected. As this enhancement to Fleet Secure demonstrates, Inmarsat is constantly monitoring the ever changing cyber security landscape and devising new tools and approaches for addressing potential problems; ensuring that ships and their crew remain safe –physically and virtually." Inmarsat has also launched a training app for mobile devices, Fleet Secure Cyber Awareness. This enables seafarers to educate themselves on the tactics that cyber criminals might employ

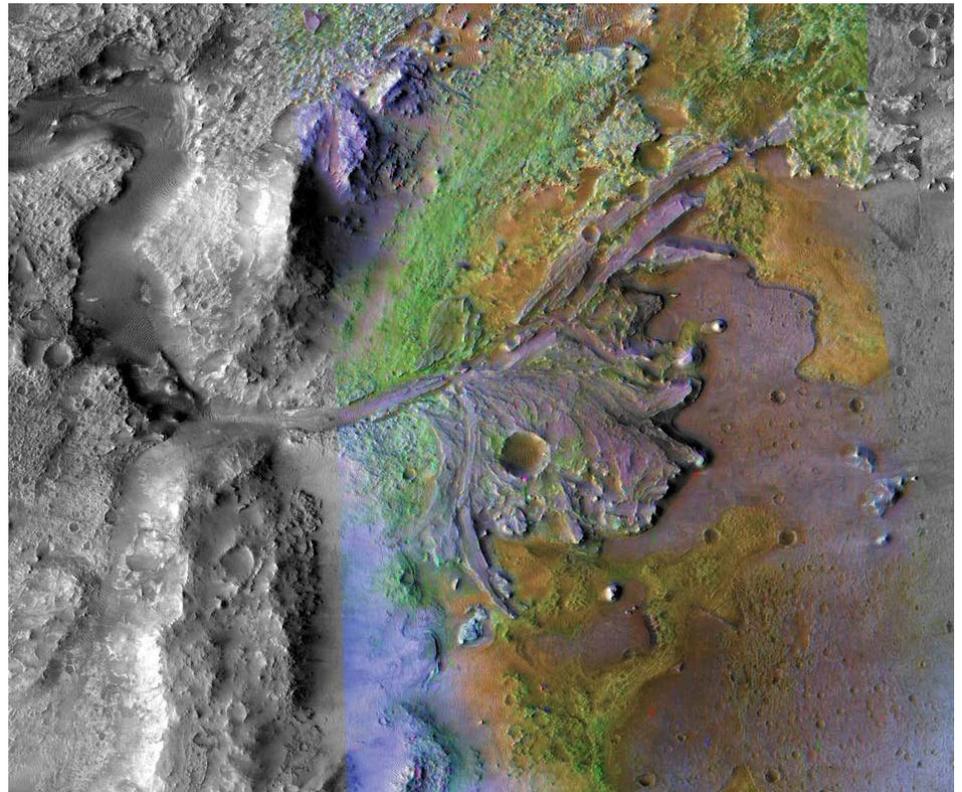
in attempting to infiltrate a company's IT infrastructure. Addressing the human element is essential to maintaining a strong security posture, says Mr. Broadhurst: "Many attempts to gain unauthorized access to IT infrastructure require some sort of activation by an end-user in order to infect a system and cause further damage. These attacks are often heavily disguised so as to trick and manipulate end-users into unwittingly granting permission. "However, there are nearly always tell-tale signs that, if spotted in time, would prevent escalation. Crew education is therefore an indispensable component in realizing a well-rounded security strategy and the reason behind teaming up with Stapleton International and Marine Learning Alliance to launch our Fleet Secure Cyber Awareness module."

NASA Selects Landing Site for Mars 2020 Rover

NASA has chosen a Martian crater that once hosted a lake and river delta as the landing site for a mission that will collect samples for eventual return to Earth. The agency announced that it selected Jezero Crater as the landing site for the Mars 2020 rover mission. That spacecraft, scheduled for launch in July 2020 on an Atlas 5, will land in the 45-kilometer-wide crater in February 2021. The selection of Jezero was the culmination of a review process that lasted more than four years, as scientists evaluated the benefits of prospective sites and engineers studied the ability to safely land in those regions. More than 60 sites were considered at the first in a series of landing site workshops in 2014, said Michael Meyer, lead scientist for NASA's Mars Exploration Program, during a call with reporters about the site selection. By the time of the final site selection workshop, held in October, scientists had whittled down that list to four. In addition to Jezero was a nearby region, called Northeast Syrtis, which had ancient rocks of interest to scientists. A third site, called Midway, was so named because it was located between the two; it had rocks similar to those at Syrtis and was in driving range of Jezero. A fourth site, Columbia Hills, was first visited by the Spirit rover in 2003, but fell out of contention at the final workshop. Jezero won out because of the prospects of finding biosignatures of past life there. The crater was home to a lake about 3.5 to 3.9 billion years ago that was as deep as 250 meters, said Ken Farley, Mars 2020

project scientist. Images of the crater show the remnants of a delta from a river that flowed into the lake. "This is a major attraction from our point of view," he said. "The delta is a good place for evidence of life to be deposited and preserved for the billions of years that have elapsed since this lake was present." That life, he said, could have lived in or around the lake, or existed further upstream and was washed down into the delta. The region, he said, is also rich in carbonate rocks that can

be another habitable environment, as well as preserving the conditions of that early Martian environment when they formed. While Mars 2020 is based on the Curiosity rover, including using the same "sky crane" landing system, Mars 2020 will make use of a new technology called terrain relative navigation. That system, where the spacecraft takes images as it descends and compares them to a map to enable a more precise landing, allowed NASA to consider sites with more hazards.



FCC Approves Broadband Satellite Services, Galileo Access

The FCC's meeting last week focused on space-related items, including approval of four satellite constellations proposed for broadband internet or IoT services, as well as officially allowing users in the U.S. to tap into signals from Europe's Galileo satellite navigation system. The FCC approved requests from four companies proposing to launch low earth orbit (LEO) satellite constellations to provide global broadband internet or IoT services. The four companies or systems are Kepler,

LeoSat, SpaceX and Telesat. In an Order and Declaratory Ruling, the FCC granted Kepler's request for U.S. market access with certain conditions. The approval allows Kepler, a proposed constellation of 140 satellites originally licensed by Canada, to offer global IoT services using sensors and other "intelligent" devices. The satellites will use the 10.7 to 12.7 and 14.0 to 14.5 GHz frequency bands. In another Order and Declaratory Ruling, the FCC granted LeoSat's request for

U.S. market access. LeoSat, which will operate under the ITU filings of France with a planned authorization from the Netherlands, proposes to provide high speed connectivity for enterprises and underserved communities from a constellation of 78 satellites. LeoSat will use the 17.8 to 18.6, 18.8 to 19.4, 19.6 to 20.2, 27.5 to 29.1 and 29.5 to 30.0 GHz frequency bands. In a Memorandum Opinion, Order and Authorization, the FCC authorized SpaceX to construct, deploy

and operate a LEO constellation of more than 7,000 satellites and granted SpaceX's request to add the 37.5 to 42.0 and 47.2 to 50.2 GHz frequency bands to its previously authorized NGSO constellation. In a written statement, the FCC said the updated approval provides SpaceX with additional flexibility to provide diverse geographic coverage and capacity to support a wide range of broadband and communications services globally, although the FCC has imposed "certain conditions." In an Order and Declaratory Ruling, the FCC granted Telesat, a proposed constellation of 117 satellites licensed by Canada, access to the U.S. market. Telesat plans to offer high speed, low latency communication

services using the 37.5 to 42.0 and 47.2 to 50.2 GHz frequency bands. Acting on a request from the European Union, the FCC has approved allowing users located in the U.S. to access the Galileo global navigation satellite system (GNSS), developed by Europe. The change allows devices such as mobile phones that already have the capability to access two of Galileo's three signals, augmenting signals from the U.S. Global Positioning System (GPS). The added bands should improve availability and reliability of GNSS services in the U.S. The FCC order permits devices to access two of Galileo's satellite signals that are in the same bands used by GPS:

The E1 signal in the 1559 to 1591 MHz por-

tion of the 1559 to 1610 MHz Radionavigation Satellite Service (RNSS) band.

The E5 signal in the 1164 to 1219 MHz portion of the 1164 to 1215 MHz and 1215 to 1240 MHz RNSS bands.

By design, the Galileo and GPS systems are interoperable, with Galileo's E1 and E5 frequencies complementary, as reflected in the 2004 European Union/United States Galileo-GPS Agreement. However, the FCC did not approve access to Galileo's E6 signal within the U.S. E6 falls in the 1260 to 1300 MHz band, which is not allocated for RNSS in the U.S. nor used by GPS. In a statement, the FCC said access to the E6 signal could constrain future options for using that spectrum.

Bangladesh Gets Keys of Bangabandhu Satellite



Bangladesh was handed over the keys of Bangabandhu Satellite-1 by its manufacturer Thales Alenia Space, meaning the government can finally start monetizing the Tk 2,765.66 crore-project. The government plans to earn foreign currency as well as save them by selling the satellite's transponders to other countries and getting the local television channels to telecast their services through it. Currently, there are 37 satellite television channels in Bangladesh and they shell out about \$14 million every year to use other countries' satellites for broadcasting. The government has decided to start the satellite's commercial services as early as next week with transmission of state-run satellite television channel BTV. A high delegation of Thales Alenia Space handed over the transmission and operation management of the country's first-ever communications satellite to the government last evening at the Bangladesh Communication Satellite Company Limited (BCSCL) office. Mustafa Jabbar, telecom and ICT minister; Shyam Sunder Sikder, telecom secretary; Md Jahirul Haque, acting chairman of Bangladesh Telecommunication Regulatory Commission; and Md Mesbahuzzaman, Bangabandhu Satellite-1 project director, signed the documents for formally receiving the

satellite's management. Thales Alenia Space, a Franco-Italian aerospace manufacturer, has designed and built the satellite that has been launched into the orbit on May 11 this year. The code and switch of the satellite will be handed over it to BCSCL in the presence of Prime Minister Sheikh Hasina within a day or two, said Haque, team leader of the Bangabandhu Satellite-1 project. "After that the satellite can start commercial operation," he added. State-run satellite television channel BTV has already done a number of test runs and found very good quality transmission through the satellite, said Shahjahan Mahmood, chairman of BCSCL. "Some private television channels like Ekattor TV will move to Bangabandhu-1 within a short time," said Mahmood, who was earlier the chairman of the BTRC and led the satellite launching procedures. Ekattor TV authority said they are seriously considering moving to the country's prestige satellite. "But before we do that we are holding meetings with the BCSCL authority to iron out some issues," said Mozammel Haque Babu, chief editor of the television station. Earlier in September, BTV delivered live coverage of the South Asian Football Federation (SAFF) Championship 2018 via the satellite, while some other television channels also tested their transmission as well. "Without getting the full control of the satellite's ownership BCSCL could not go for commercial negotiations. That will now get pace," Mahmood said. Thaicom, Thailand's largest satellite operator, was appointed in September to explore the business development prospects of the Bangabandhu Satellite-1 in six countries, including four neighboring ones. "We are expecting Thaicom to bring business for us and make the satellite a money-making venture for us," Mahmood added. According to the initial plan, the satellite venture will be business viable within seven years of its launch. BCSCL has already signed preliminary agreements with some of the government offices; it has also sought business from banks as well, officials said.

Inmarsat Signs Honeywell Aerospace as Global Reseller of GX Aviation Inflight Broadband Solution

Inmarsat, the world leader in global mobile satellite communications, has expanded its global network of Value Added Resellers (VARs) for its GX Aviation inflight broadband solution with the addition of Honeywell Aerospace. The agreement builds on Inmarsat's long-standing partnership with Honeywell, who already manufactures the JetWave hardware for GX Aviation and sells Inmarsat's Jet ConneX inflight wi-fi service for the business aviation market, through its GoDirect retail services business. In addition, it is further endorsement of Inmarsat's commitment to operate the reference inflight connectivity network for airlines around the world. GX Aviation is the world's first and only global, high-speed inflight broadband service, delivered through a wholly-owned and operated network of Global Xpress (GX) High-Throughput Satellites (HTS). This award-winning solution allows passengers to seamlessly browse the internet, stream videos, check social media and more during flights, with onboard connectivity comparable to the mobile broadband services they receive on the ground. As part of the agreement, Honeywell

will now market GX Aviation to airlines worldwide through its rapidly growing GoDirect retail services business. This increases the company's focus on end users, allowing it to tailor smart connectivity solutions directly to individual customers – whether in the airline or business aviation space. In addition, Honeywell will continue to manufacture and sell the JetWave hardware to airline and business aviation customers.



Soyuz Launches European Weather Satellite

A Soyuz rocket successfully launched a European weather satellite November 6, completing a constellation of polar-orbiting satellites and providing additional reassurance about the reliability of the Soyuz. The Soyuz ST-B rocket lifted off from the Guiana Space Center in French Guiana. The Metop-C satellite on the rocket deployed from the Fregat upper stage one hour after liftoff. The 4,084-kilogram satellite, built by Airbus Defence and Space for the European weather agency Eumetsat, is the third and final satellite in the Metop series of polar-orbiting satellites. The spacecraft joins Metop-A, launched in 2006, and Metop-B, launched in 2012, both on Soyuz rockets from Kazakhstan. Metop-C will operate in the same 817-kilometer sun-synchronous orbit, with a mid-morning crossing time, as Metop-A and -B. The three satellites will be spaced 120 degrees apart in the orbit until the retirement and deorbiting of Metop-A, scheduled for 2022. Metop-C carries nine instruments to collect imagery, temperature and humidity profiles in the atmosphere, and sea surface conditions, as well

as monitor space weather conditions. That instrument suite includes three provided by the National Oceanic and Atmospheric Administration as part of cooperation with Eumetsat that includes sharing of data from the NOAA-20 satellite, which offers complementary observations from its mid-afternoon orbit. The launch is the third for the Soyuz since an Oct. 11 failure during the launch of the crewed Soyuz MS-10 spacecraft, forcing the use of the rocket's abort system to escape from the rocket and safely land downrange from the Baikonur Cosmodrome. A Soyuz rocket launched a military payload October 24 from the Plesetsk Cosmodrome in northern Russia, while another launched a Glonass navigation satellite November 3, also from Plesetsk. Russian investigators said November 1 that the October 11 launch accident was caused when one of the four side boosters of the Soyuz failed to separate cleanly, coming into contact with the core stage. That separation issue was blamed on a sensor that was bent during assembly of the rocket. One more Soyuz launch, of a Progress cargo spacecraft, is scheduled for mid-November before the rocket is used again for a crewed mission. That launch, of the Soyuz MS-11 spacecraft carrying three people, is scheduled for December 3. The launch was the eighth mission this year for Arianespace, counting Soyuz launches from French Guiana along with its Ariane 5 and Vega vehicles. In comments at a post-launch ceremony, Arianespace Chief Executive Stéphane Israël said three more launches are scheduled through the end of the year, starting with the Vega launch of a Moroccan Earth observation satellite Nov. 20. That will be followed by an Ariane 5 launch of two communications satellites in early December and a Soyuz launch of a French reconnaissance satellite in mid-December. 





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ARTICLE

Succeeding with the Digital Consumer

People and culture, not technology, remain the biggest stumbling blocks for telcos to become digital



Rob Van Dale

Partner in the Communications, Media & Technology Practice



Sauvik Tegta

Consultant in the Communications, Media & Technology Practice

ATKearney

Many industry executives spend a considerable time thinking about the following two strategic questions: "How much should my operator transform from connectivity to advanced digital services?" And, "how can my business continue to succeed in a digital and fast-evolving consumer market?"

According to extensive multi-year research by A.T. Kearney, even the leading operators are a long way from reaching their average target of generating at least 30% of their revenues from sources other than connectivity as of 2018.

To help in answering these overarching questions, A.T. Kearney launched a few years ago a global initiative to better understand the future of the telecoms industry and to help industry executives adapting their companies to the rapid changes in the digital marketplace. This study revealed that most telecom operators were aiming high and had strong ambitions (see also figure 1):

- Basic connectivity business models - which position telcos as a network company or a data utility - were considerably less popular as future option
- Majority of CxOs indicated that they want to become a "digital navigator" offering a premium network, superior customer experience and analytics, providing digital services, and partnering with over-the-top (OTT) internet players.

Today, this ambition hasn't faded. Our most recent study confirms that despite an intensifying competition for consumer's time and attention, telcos still aspire to become "digital navigators" as confirmed by over 55% of our recent interviewees - including more than 60 Chief Commercial Officers (CCOs) and Chief Marketing Officers (CMOs) across the Middle East and Europe.

Yet while the choice to adopt a "digital navigator" business model is clear, progress towards turning it into reality has been slow. According to extensive multi-year research by A.T. Kearney, even the leading operators are a long way from reaching their average target of generating at least 30% of their revenues from sources other than connectivity as of 2018. Similarly, digital share in total

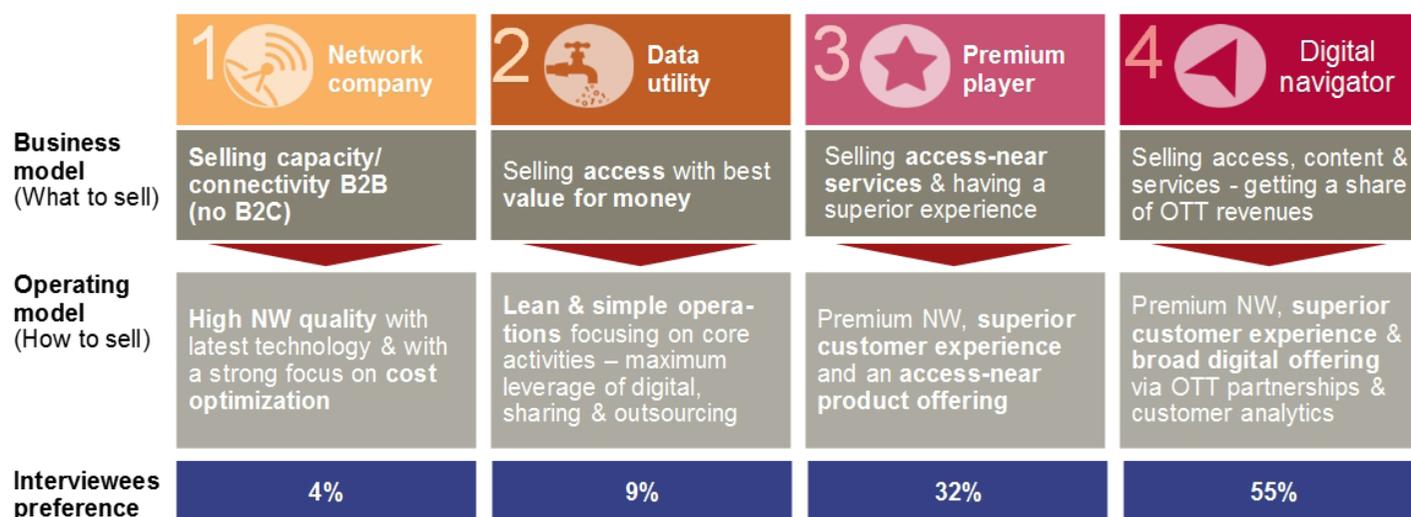


Figure 1: Next Generation telecom operator archetypes

sales is 17% versus the ambition level of 30%. Moreover, digitization of customer service is going slowly; digital share in services for leaders is around 7%, well below their ambition level of 45%.

The fact is that telcos' execution has trailed strategic intent, shackled by their legacy operating model, including legacy mindset and IT infrastructure. There is a clear disconnect between the aspired business model and the required operating model. Drastic (digitally-enabled) changes to the operating model across product management, customer interactions and especially people and culture are needed to fulfil telcos' strategic ambitions and meet expectations of a digital consumer:

- **Product management** needs to better prioritize the use of customer data to offer personalized pricing and propositions. Data management and analytics need to be regarded as a core competence, like for example Google or Facebook do. Product offerings need simplification, decoupling from contracts and a greater flexibility to customers. These recommendations are supported by our interviews where 84% agree on the importance of customer data analysis and 79% on the need to reduce the number of tariffs.
- **Customer interactions** require a shift to mobile first, voice second. When asked what kind of journey customers will choose in the future, 77% of the interviewees agreed that customers will want to use mobile channels first and

foremost. Customer communication will have to focus on personalization and real-time interaction. Omnichannel integration will enable greater convenience and be key to strengthen sales channels. Digitization and automation will transform customer service with an expected 30% - 50% fall in the customer service workforce as Robotic Process Automation (RPA) and AI solutions are implemented.

- However, **people and culture**, not technology, remain the biggest stumbling blocks for telcos to become digital. More than 83% of CCO's and CMO's consider capabilities and skills as the most challenging issue. Some 66% of the interviewees identified culture as an issue, reflecting an inability to work in ecosystems, and a lack of entrepreneurial thinking and customer centricity. Almost half of the executives regard partnering with start-ups, as well as leading OTT players and technology suppliers, as a significant hurdle – a sharp contrast to the operating model of global tech players such as Amazon, Google etc.

Clearly, majority of telcos with ambitions to become a "digital navigator" have not determined the right operating model and the "how" to get there. In fact, most are moving forward at two different speeds – fast-running customer facing functions (think products, self-help and apps, chatbots, etc.) along with a slow-moving back-office (think IT, and support functions such as HR, Finance, Procurement,

etc.) which risks a rupture across the organization and jeopardizes sustainable future growth.

Depending on operators' ambition level, current digital maturity, and current ability to change internally - especially in terms of their people and culture, we see three potential approaches for telcos to refine their operating model: the omnichannel model; the digital-first model; and the digital-only model (see Figure 2):

Clearly, majority of telcos with ambitions to become a "digital navigator" have not determined the right operating model and the "how" to get there. In fact, most are moving forward at two different speeds – fast-running customer facing functions (think products, self-help and apps, chatbots, etc.) along with a slow-moving back-office (think IT, and support functions such as HR, Finance, Procurement, etc.) which risks a rupture across the organization and jeopardizes sustainable future growth.

- **The omnichannel model** is based on the belief that customers will embrace digitization relatively slowly and it involves the integration of a strong digital channel into existing direct and indirect physical channels. The model brings a clear focus on creating omnichannel journeys adapted to the

Whichever option telcos choose, they need to act urgently. Given the intense competition from internet-based service providers, telcos need to address their people and culture issues head on and embrace data driven product management and a mobile-first digital customer interaction

expectations of the customer base. However, it risks that the telco fails to attract the right digital talent. Several incumbent operators in Europe are following this model today.

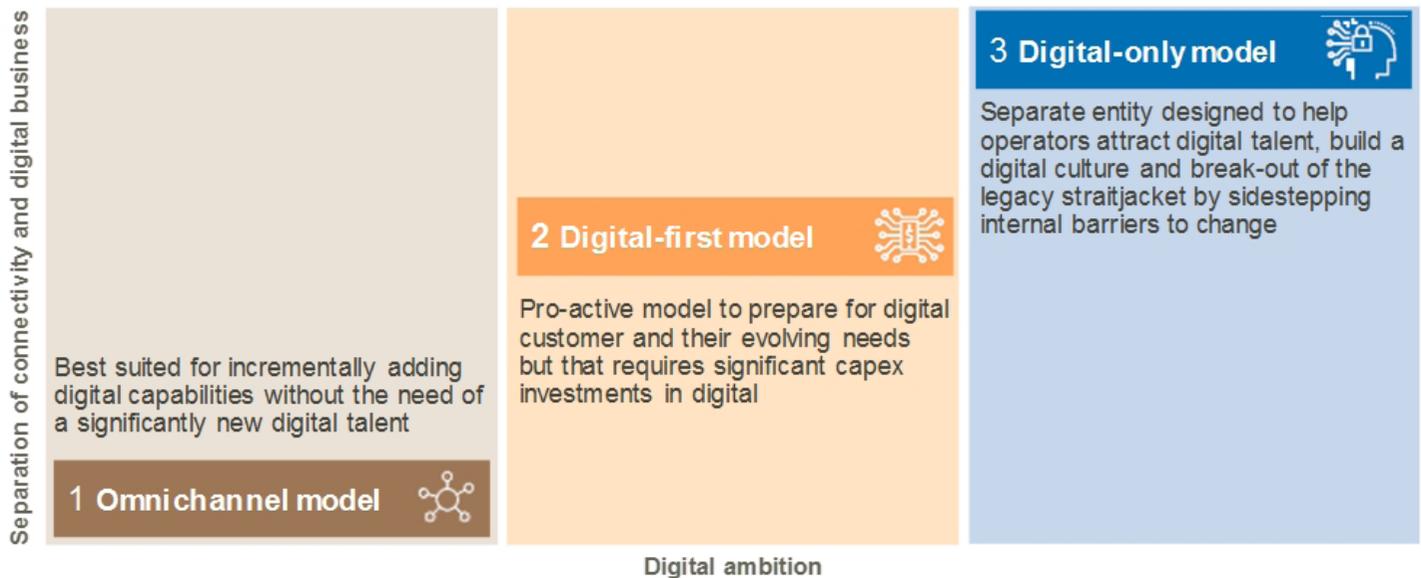
- **Digital-first model** explicitly prioritizes digital channels, only retrofitting products, processes, and customer experience from the digital into the physical world. It typically requires capex to be invested in digital channels, along with a prioritization of the digital journey in terms of budget and design. Operators such as Telstra in Australia and Rogers in Canada are actively pursuing this model.
- **The digital-only model** orients all activities around new revenues and services, as well as the design of the online, mobile, and voice channels into a separate legal entity especially where it's imperative to give proper focus on attracting the right talent and building a digital culture. Telcos such as VEON and SKT are pursuing this approach using

OTT services. We have also recently seen some operators in the Middle East experimenting with this model.

Each approach has pros and cons: for example, the first and second option will require a much more profound and holistic multi-year transformation of the full organization, while the third (digital-only model) allows for rapid build-up, creating its own separate 'start-up-like' culture and attracting digital talents. But the latter will likely, at some point, need to be integrated into the main operations.

Whichever option telcos choose, they need to act urgently. Given the intense competition from internet-based service providers, telcos need to address their people and culture issues head on and embrace data driven product management and a mobile-first digital customer interaction if they really want to succeed with the digital consumer and become a true "digital navigator".

Figure 2: Three potential journeys to become a digital telecom player



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WHOLESALE NEWS

Brazil and Chile to Eliminate Roaming Fees under New FTA

Brazil and Chile have agreed to end international roaming charges between the two countries as part of a free trade agreement (FTA) signed this week. Under the deal, roaming fees will be wiped out once the pact has been in effect for two years. Meanwhile, the FTA facilitates greater cross-border competition and integration, with the Chilean government

noting in a statement that the pact allows SMEs to participate in public tenders under the same conditions as local suppliers and will 'facilitate operations for Chilean service providers and digital products in bilateral electronic trade'. Regarding the deal, which was negotiated in under six months, President Pinera of Chile was quoted as saying: 'Brazil is more than

our foremost trading partner, with trade exceeding USD11 billion. It is also the main market for Chilean investments, which are valued at more than USD31 billion. The agreement includes new chapters on technology, cybersecurity, Antarctic collaboration, and on many areas where we have made progress.'

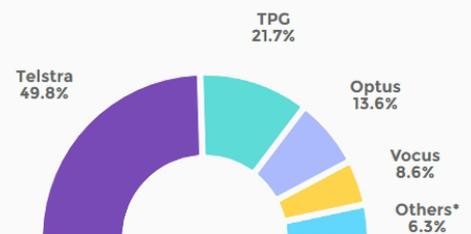
ACCC Publishes Latest NBN Wholesale Statistics

Almost 4.5 million customers are now receiving a broadband service via the National Broadband Network (NBN), the Australian Competition and Consumer Commission (ACCC) has revealed with the publication of its latest 'NBN Wholesale Market Indicators Report'. Per the regulator, as at 30 September 2018 there were a total of 4.488 million subscribers being served across all the various elements of the NBN, up from 3.038 million a year earlier. Of those, the largest proportion (2.246 million) are served via fibre-to-the-node (FTTN) technology, almost double the 1.217 million reported a year earlier. Fibre-to-the-premises (FTTP) connections were the next largest, at 1.297 million, up 10.6% year-on-year, while HFC accesses numbered 442,542 (3Q17: 290,749). In terms of the providers offer access over the NBN to consumers, Telstra served the largest number of subscribers – 2.237 million at end-September 2018, up from 1.504 million a year earlier. TPG Group had a total of 974,311 customers accessing its service via the NBN at the end of the reporting period, up from 691,588, while Optus had 609,602 (3Q17: 409,022), and Vocus 386,551 (261,588). Also of note, almost 50% of all NBN-based customers are now signed up to a service offering downlink speeds of at least 50Mbps. With there being 1.838 million customers on the 50Mbps NBN tariff at end-September 2018, up from just 122,268 a year earlier, the number of 100Mbps accesses was up 11% y-o-y at 394,926, though this was down from a peak of 414,002 at end-March 2018.

Key quarterly indicators



Wholesale access seeker market share



G5 Sahel to Eliminate Roaming in Their Region

Bukina Faso, Chad, Niger, Mali and Mauritania, together making up the G5 Sahel, have adopted regulatory texts aimed at eliminating roaming fees among each other, Ecofin reported. The

council of ministers of the G5 Sahel elaborated the missions of the national coordination committee of the "free roaming" project during their meeting held on 29 October in Niger. [\[1\]](#)

ARTICLE

Digital Transformation by Artificial Intelligence (AI)

Digital transformation by Artificial Intelligence (AI) is not a need; it is a must have. AI can help telecom operators to increase their market value, make better decisions in complex business processes and improve the digital experience of end users. By 2021, expected spend on AI technologies by companies is around 57.6 Billion dollars*. 40 Trillion Gigabytes (zettabytes) of data will be created. It is 300 times more than we had in 2005.

With the capacity of 5G, the systems can be more connected, more accessible and more manageable. To make this journey real, telecom operators need scalable systems. In addition to that, having an automated decision-making AI agent help to fine tune the systems. AI and 5G integration can make nimble manageable network design and implementation.

The term Artificial Intelligence encompasses several areas in different contexts, ranging from sensors and robotics to qualitative argumentation. Indeed, AI is a vast field both in terms of cutting-edge scientific research and in terms of its applications. AI methods are applied in several industries to save costs, reduce risk, increase efficiency, make better decisions, deliver optimal solutions. Relatively simple applications like customer service chatbots, personalised recommendation systems, big data management are indispensable for many companies. More complex applications like supply chain network optimisation, investment planning, forecasting, advanced analytics, real-time automated decision-making systems are providing a competitive advantage to companies which can embrace these new technologies. In a narrow sense, digital transformation can be seen as the replacement of traditional processes with digitised counterparts. A more comprehensive definition of digital transformation has to include intelligent decision making at the heart of the newly developed systems. Effective digital transformation must make use of analysis and optimisation to achieve a step change.



Melda Akin

Co- Founder
Dimension14 - AI and Machine Learning
Organization

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* <https://www.idc.com/>

The telecommunication sector is a prime candidate for being the pioneers of incorporating advanced Artificial Intelligence methods into their digital transformation journey. Therefore, telecom operators accelerate their digital transformation by integrating new innovative digital services for end-user operations and internal operations. For instance, advanced analytics can help companies to make better investments, develop a sales strategy, improve network design by analysing customer behaviours and also can provide more customers loyalty to their services. As another example, operators can reshape their services based on actual scenarios, simulate their business development models and can have dynamic models compatible with real market needs. By Location Based Targeted Advertisement, mobile operators can understand their customer behaviours even in the indoor locations without any hardware installation, and engage with them with a relevant message at the right time and location. With the help of machine learning technology personalising the experience with high accuracy is possible and crucial to power real-time customer engagement. In addition to chatbot and live supports, analysing customer requests and frequencies together with the network data, and their location can help to find the right solution to solve customer's problem quickly and more efficiently or fixing potential problems before they occur can also decrease the operational costs. Secondly, customer services can be improved by identifying daily customer requests. For example, identifying potential hot requests from thousands of requests, and send them to the related departments automatically by also providing brief information.

Even though organisations rapidly change to keep up with digitalisation, the main metrics seem to stay the same. Sustainability, integrity and expandability of telecom operators are vital elements to remain in the race. Ability to move fast, to observe and interpret, to survive and operate is crucial. Therefore, telecom operators must not only adapt to

today's AI solutions but also be able to integrate their AI strategy to the overall organisation. However, these integrations

Telecom operators must not only adapt to today's AI solutions but also be able to integrate their AI strategy to the overall organisation.

might create new challenges. With the 5G plan, networks' scalability, capacity and flexibility might need to be improved. At the same time, the current systems we have are not as agile as expected. Advanced AI techniques play a pivotal role in this process since transforming the infrastructures are quite costly comparing to the business process transformations. That is why a holistic AI approach should be designed and implemented.

Currently, telecom operators assess many technology solutions. When telecom operators and regulators perform several solutions to make their processes more agile, the next challenge might be making the integrated platforms more agile and elastic. On the other hand, it is not easy to take the right action in a hyper-connected world. When the telecom operators and regulators can take the right action, it might also be costly. If this expense is not an issue for the organisations, the next challenge might be providing the optimal accessible and governable processes. With the capacity of 5G, the systems can be more connected, more accessible and more manageable. To make this journey real, telecom operators need scalable systems. In addition to that, having an automated decision-making AI agent help to fine tune the systems. AI and 5G integration can make nimble manageable network design and implementation.

There is tremendous potential in applying AI to challenging problems in businesses. However, there are also very significant concerns one needs to keep in mind when applying AI methods. I would like to

highlight two concerns that can potentially be the most devastating unless they are handled with care.

First significant concern about applying AI methods in a business context is the data-driven nature of these methods. Businesses need to be very wary of using user data in ways that may potentially conflict with the user agreements between the data collectors and users. This issue is particularly challenging when datasets from multiple sources need to be linked together. Companies can control and reduce this risk by working with digital transformation and AI consultants that have significant expertise and legal support.

A second major concern is that of explainability, especially in applications where an AI system replaces a task that was previously performed by a professional.

The telecommunication sector is a prime candidate for being the pioneers of incorporating advanced Artificial Intelligence methods into their digital transformation journey.

These are tasks like sales/ account management (traditionally performed by a sales/ account representatives), suspect identification (usually performed by security personnel). Some cutting-edge AI methods lend themselves better to explainability whereas some others that produce impressive results are terrible for explainability (such as deep learning). When explainability is a concern in a particular application, this must be identified as a requirement early in the planning phase. Developing a self-explaining AI system requires peculiar expertise that is not easy to come across in the consultancy market. That is why organisations should collaborate with AI experts who fill the gap between the advanced AI theories and the real business cases. 📌

Melda Akin helps organizations in adopting innovation and solving complex decision-making problems with the help of artificial intelligence and machine learning technologies.

TECHNOLOGY NEWS

Telstra Claims First Australian live 5G Connection

Telstra has announced what it termed 'another milestone in its 5G roadmap', having achieved a live 5G connection using a commercial fifth-generation

chipset on its mobile network. In a press release regarding the matter the cellco said that this development represented the country's first live 5G 3GPP R15 data

call using a commercial chipset in a form factor device on Telstra's mobile network, with the connection using its 3.5GHz commercial spectrum, Ericsson's latest 5G network, and Qualcomm Technologies commercial 5G chipset in a commercial form factor device. Commenting on the matter, Channa Seneviratne, Telstra's Network Engineering Executive, was cited as saying: 'Today's announcement is a significant milestone as it signals that commercial 5G devices are getting closer and closer. Field testing in our real-world mobile network with this chipset over our commercial spectrum moves the verification well and truly from the lab into the street. The team will continue testing over the coming months to improve data rates and overall performance in readiness for device availability.'



Keysight, SK Telecom Sign MoU to Accelerate 5G Network Design and Deployment

Keysight Technologies, Inc., a leading technology company that helps enterprises, service providers, and governments accelerate innovation to connect and secure the world, announced that it has signed a Memorandum of Understanding (MoU) with SK Telecom to collaborate on 5G network design development and testing technology. The MoU covers development of 5G device performance validation technology, test cases and processes to help verify that new products perform as intended on the mobile operator's network. The two companies will also collaborate on Massive MIMO and beamforming to achieve higher data speeds and lower latencies, which many future 5G applications will require. Mobile operators deploying 5G technology on mmWave frequencies need to address challenges

around higher radio propagation losses as well as complex fading conditions. Keysight's expertise in mmWave combined with its comprehensive suite of network and channel emulation solutions supports mobile operators targeting early deployments of 5G networks. "We are excited to extend our collaboration with SK Telecom to support their early deployments of 5G on mmWave frequencies," stated Kailash Narayanan, vice president and general manager of Wireless Devices and Operators at Keysight Technologies. "Keysight's early engagements with market leaders, contributions to the 3GPP standardization development and scalable 5G test and measurement solutions is enabling a connected mobile ecosystem to accelerate 5G deployment." SK Telecom is the largest mobile operator in Korea by

both revenue and number of subscribers. As of December 2017, the company holds around 50 percent of the market, with 30.2 million mobile subscribers including 22.87 million LTE subscribers. It has reached KRW 17.520 trillion in revenue in 2017. SK Telecom has led the advancement of mobile technologies ranging from 2G to 4G and is currently setting important milestones in its journey to 5G. "SK Telecom is targeting seamless 5G communications quality by leveraging wider bandwidths in mmWave spectrum," says Jongkwan Park, head of Network Technology R&D Center for SK Telecom. "We are pleased to collaborate with Keysight, the company with 5G expertise and solutions in this field, to help support our ambitious 5G deployment goals."

Swisscom Latest to Claim 5G First in Live Network Demo

Swisscom has secured the first over the air connection on a live 3.5GHz 5G network by connecting a prototype smartphone. The operator worked with Qualcomm and Taiwanese hardware vendor Wistron NeWeb, which built the mobile hotspot. Two devices were connected in Lucerne outside of a lab environment. Urs Schaeppi, CEO of Swisscom, said: "One year ago, in cooperation with Ericsson, we presented the first laboratory applications. Today, we are taking the next step by presenting a 5G smartphone prototype for the first time in real conditions on our 5G network." Schaeppi said Switzerland's future as an innovation hub hinges on the deployment of 5G. It is planning to roll out the technology to 60 cities across the country by the end of next year. Parts of Lucerne, Bern, Geneva, Zurich and Burgdorf have been connected to the 3.5GHz network. Swisscom's CEO said: "Though many

applications are in the pipeline, they are still at an early stage. Back when 3G was launched, people doubted whether mobile Internet was necessary at all. Today, we know that mobile applications on 3G and 4G have revolutionized our daily lives. Now we've reached the same point with 5G." In September, Burgdorf was the venue for Switzerland's first end-to-end 5G New

Radio data call. It also trialed fixed wireless internet access in the remote village of Guttanen over the summer. However, the operator has been a longstanding critic of the country's government, accusing it of holding back the deployment of 5G through restrictive policymaking related to the supposedly harmful effects of radio waves.



Open Fiber Begins Testing of 'White Area' Infrastructure

Italian wholesale network operator Open Fiber has begun testing the first sections of its broadband networks which have been rolled out under government tenders to improve connectivity in so-called 'white areas'. The telco says fiber-to-the-home

(FTTH) infrastructure in four municipalities is being opened to third-party service provider partners for six months of testing. Open Fiber has begun work on deploying fiber networks in 900 municipalities, with that total expected to reach 1,000 by the

end of this year. Press rumors are linking Open Fiber to a potential tie-up with incumbent fixed line operator Telecom Italia (TIM).

Telenor Launches Norwegian 5G Pilot

Telenor Group has announced the launch of a 5G pilot project in the town of Kongsberg, in Buskerud county, saying that this will serve as 'a testbed for the superfast fifth generation mobile network in Norway'. According to the operator, it will offer select residents of the town the chance to test 5G technology until summer 2019; initially five families will test broadband and TV services delivered via 5G in their homes, with the pilot to be expanded to include more test users at a later date. Several Norwegian businesses are involved in the pilot project, including Coop, The Norwegian Air Ambulance Foundation and Applied Autonomy. 'We are starting in Kongsberg and will expand

to offer more pilot locations in 2019, while gradually preparing for the commercial roll

out of 5G in 2020,' said Bjorn Ivar Moen, acting CEO of Telenor Norge.





KPN Introduces VoWiFi

The Netherlands' KPN has launched voice-over-Wi-Fi (VoWiFi) – also supporting texting over Wi-Fi – initially for Samsung and Apple iPhone devices. The operator's website admits that – although its cellular network covers 99% of the population – there are still plenty of spots where indoor mobile signal is weak and that it is convenient to switch to a Wi-Fi network e.g. in a user's home or workplace. When attempting to make a VoLTE call where KPN's 4G network coverage is insufficient/absent, a compatible device with VoWiFi activated will automatically switch to Wi-Fi.

Ericsson Drives 5G Standardization Agenda with Top Global Legislators

In order to reach its ambitious goal of making 5G services available by 2020 to all member states, the European Commission – the EU's most important legislative body – gathered policy makers and industry leaders from across the Union to discuss 3GPP 5G New Radio (NR) standardization. Ericsson is one of the key industry players who will be submitting 3GPP NR specifications as an ITU IMT-2020 candidate. During the 3GPP workshop hosted by the European Commission in Brussels, held October 24-25, Ericsson experts emphasized the importance of supporting global interoperability and availability of 5G. Håkan Djuphammar, Head of Standardization at Ericsson, says: "If we want our industry to be at the forefront of the next generation of technology, we must make

exceptional innovation the key benchmark. Of all the standards for cellular technologies that we've contributed to over the decades, the ones for 5G are the most essential to get right as they will lay the foundation for the age of automation." A limited number of experts were invited to present details of 5G NR standardization and Ericsson was well represented by key standardization leaders who have prominent roles in the 3GPP. Håkan Ohlsén, ITU-R WP5D Vice-Chairman, introduced the event, and Gino Masini, 3GPP RAN WG3 Chairman, introduced the NR Radio Access Network architecture. Havish Koorapaty, 3GPP RAN WG1 Vice-Chairman explained the physical layer structure, numerology and spectrum utilization and Asbjörn Grövlén, Technical Coordinator of the Ericsson 3GPP RAN WG1 team, presented the evolution path from LTE. Grövlén also presented the link budget template for the IMT-2020 submission to ITU. In September 2018, Ericsson representatives also participated in the White House-sponsored, 5G Summit in Washington, D.C. The aim was to share insights and foster discussions centered on spectrum and standards. During the standards part of the discussion, Ericsson emphasized the importance of enforcing the World Trade Organization-backed principles of consensus, openness, balance and due process in both technical standards and governance development in standard development bodies.



Samsung, NEC to Help Each Other's 5G Strategy

Samsung and NEC have become the latest telcos to collaborate on developing new 5G services and products. The vendors said in a statement that the partnership will bring together the companies' "best-in-class technology and expertise". They will build customized and region specific solutions that will meet operators' demands. Atsuo Kawamura, EVP and President of the Network Services Business Unit at NEC Corporation, said: "5G development based on standardization will help to accelerate business transformation throughout

global markets. "As 5G commercialization is just around the corner, we are confident that the partnership with Samsung will continue to solidify our stance as a 5G leader." Youngky Kim, President and Head of Networks Business at Samsung Electronics, said: "5G will unlock the potentials, create new values and push the limits of today's technology. "We are excited to announce our joint efforts with NEC to boost 5G end-to-end solution portfolio for the best user experience." Samsung has been busy pushing its 5G

strategy forward with a wealth of new tests, acquisitions and plans. It announced that it was powering its forthcoming 5G small cell range with Qualcomm chips. It bought Spanish artificial intelligence and networks analytics firm Zhilabs, which it said would boost its automation solutions and underpin upcoming 5G products. The Korean vendor announced over the summer that it would spend €150 billion to realign its business for the future and fund research into 5G, AI, autonomous driving and next generation semiconductors.

KT Launches 10Gbps-Capable Broadband Service

KT Corp has announced that it will begin offering a broadband internet service with downlink speeds of up to 10Gbps from today (1 November), making it the first of South Korea's operators to commercialize such speeds. According to The Korea Times the new service will initially be available in major cities nationwide, including Seoul, Daegu and Busan, with coverage to be expanded elsewhere in phases. In terms

of pricing, it is understood that the 10Gbps service will cost KRW110,000 (USD96) per month, while KT is also planning to market a plan with a maximum 5Gbps downlink speed for KRW82,500 per month. Prior to this commercial launch, the telco had reportedly been trialing its 10Gbps connectivity in Seoul and Pyeongchang since 2016. With the operator having said it plans to invest KRW9.6 trillion in both

its fixed and wireless networks between 2019 and 2023, KT's senior executive vice-president Lee Pill-jai was cited as saying of the latest development: 'We have made preparations as there has been demand from users for better services ... We are launching the 10Gbps internet service for customers who want to enjoy more realistic videos, faster speed and more exciting content.'

Mobitel Demonstrates 5G with Commercial Infra at Techno 2018

Mobitel, Sri Lanka's National Mobile Service Provider once again led Sri Lanka's Technological and Digital advancements at Techno 2018. Sri Lanka's premier Technology Exhibition that showcases the country's Engineering and Technology prowess, was energized and inspired by Mobitel's dazzling demonstration of cutting-edge Communication Services made available for the betterment of all Sri Lankans. Technology enthusiasts flocked to Mobitel's attractive stall which featured a range of its latest unique products, technologies, initiatives and innovations under the theme 'Connecting the green future' which was aligned to Techno 2018's green engineering ethos. Mobitel and Sri Lanka Telecom stepped forward as Main Sponsors for Techno 2018, which was held from 12th to 14th October 2018 at the BMICH. Mobitel's stall was unique on many fronts. Taking its 'Connecting the green future' theme to heart, the state-of-the-art stall was designed using recyclable material to the greatest extent possible. Moreover, the stall was highly interactive and engaging for visitors because Mobitel held demonstrations of its latest technologies, initiatives and innovations. Leading the way in 5G in Sri Lanka, Mobitel publicly demonstrated Sri Lanka's first 5G deployment over 3.5GHz, globally recognized as the primary frequency band for 5G, showcasing the exponential growth in broadband speeds which Mobitel will provide to its customers in the near future. This 5G Massive MIMO (Multiple Input Multiple Output) technology demonstration utilized 64x64 MIMO configuration with commercially

available user devices and commercially available network equipment, dispelling doubts over its short term viability, and thereby leading Sri Lanka's progress ahead of many technology advanced nations worldwide. Mobitel is grateful for the support and encouragement given by the Director General of Telecommunications Regulatory Authority of Sri Lanka (TRCSL) and his officers to industry players in their efforts in making advancements in the industry. Sri Lanka's national mobile service provider, Mobitel, occupies the foremost position in cutting-edge mobile telecommunication technology in Sri Lanka. Its revolutionary path to the forefront of the industry is peppered with many pioneering technologies that have paved the way for other mobile operators to follow in its wake. In fact, the rest of the industry

takes its cue from products and services introduced by Mobitel. Trail-blazing 5G in Sri Lanka having demonstrated 5G with commercial infrastructure at Techno 2018, Mobitel is poised to be the first mobile operator in Sri Lanka to introduce 5G commercially for its customers for faster connectivity and an improved experience. Despite being the first off the starting blocks with every mobile technology in the recent past, Mobitel, never loses sight of offering sustainable 'green' technology offerings that nurture the nation. While Mobitel has the capability to roll out the very latest mobile technologies, at the same time, it lends a nurturing hand to its customer base in rural areas for whom 2G and 3G technologies are a lifeline. Mobitel understands the needs of its customer segments and caters to them



with unfailing precision, while ensuring its investments in the latest technologies continue to enhance the reputation of Sri Lanka as being highly advanced in the region for technological adoption. Mobitel also publicly demonstrated Voice-over-WiFi (VoWiFi) for the first time in Sri Lanka, the ability to make traditional cellular voice calls over any WiFi hotspot. This is a significant step forward in Sri Lanka, as typical voice calls will be possible in areas of extremely poor Mobile coverage or 'Not Spots' (where owing to environmental conditions or the inability for Mobile signals to penetrate very large buildings), calls can be routed over any available WiFi hotspot. Having showcased services geared towards the masses, Mobitel also demonstrated communication services suitable for public/administrative services and large scale industries such as Police and Emergency services, Shipping, Railway communications etc. The technology was based on converting traditional analog 'Walkie-Talkie' services over Mobitel's island-wide digital LTE network, thereby ensuring enhanced coverage, superior call quality, and also

the ability to broadcast video images over push-to-talk (PTT) functions. Following the recent natural disasters in Sri Lanka, Mobitel also trialed an early warning detection system for landslides, thereby encompassing communication from early warning systems to emergency response units. Furthermore, to cater the growth of Internet of Things (IoT) deployment, Mobitel also demonstrated several NB-IoT (Narrowband IoT) products such as Smart Water Meters. Finally, in keeping with the Green Technology theme, an app based on the widely popular blockchain technology was commercially launched, whereby anyone could plant a tree and track its growth over its lifetime, thereby earning carbon credits which could be traded for free data bundles on Mobitel's network. Mobitel CEO, Mr. Nalin Perera highlighted Mobitel's 3-pronged initiative which improved the lifestyle and digital empowerment of 1) its retail customers, 2) the public services/ large scale industries and finally 3) pioneering Sri Lanka's Sustainable and Green initiatives based on its technology service offerings and acknowledged the support extended

by the Telecommunications Regulatory Authority of Sri Lanka for the creating the right environment for the growth and sustainability of the industry. Mobitel had once again delivered real-life solutions with tangible benefits to every Sri Lankan and also for advancing Sri Lanka's Digital initiatives, in keeping with Sri Lanka's Digital Vision for the country. Mobitel, as the National Mobile Service Provider, has taken on the mantle of spearheading Sri Lanka's ICT Transformation. It has positioned itself to offer services far beyond just mobile telephony. The mobile services category has evolved over time into the mobile ICT category and Mobitel is now leading the path in transforming it further in the digital service provision category. The 'X Station' has become a symbol of how Mobitel is leading the country's digital revolution. The first hi-tech Internet of Things (IoT) concept store of its kind in the country, X Station is the expert hub for futuristic technology products and services. Mobitel's innovative services today are enhancing communication, technology, health, and IT literacy opportunities for citizens.

SK Telecom Successfully Tests Interoperability between Multi-Vendor 5G Kit

South Korean mobile network operator (MNO) SK Telecom claims to have successfully tested interoperability between a 5G non-standalone (NSA) core developed by Samsung Electronics, and 5G base stations provided by Nokia and Ericsson. In a press release regarding the development, SKT confirmed that the test had taken place at its 5G testbed located in its Bundang office building. With the cellco saying it has worked closely with MNOs across the globe to develop interfaces for

interoperability between diverse multi-vendor 5G network equipment, it noted it had made 'aggressive efforts to apply and test the interfaces to achieve multi-vendor interoperability within the shortest period possible' after selecting Samsung, Ericsson and Nokia as the preferred bidders for 5G equipment last month. On the back of the successful trial, SKT now claims it is in a position to install base stations from Nokia and Ericsson within the coverage of Samsung's 5G core, which

is expected to allow it to deploy 'a more flexible 5G network with greater efficiency'. Commenting on the matter, Park Jin-hyo, Executive Vice President and Head of ICT R&D Center at SK Telecom, said: 'SK Telecom continues to lead the industry in 5G by successfully achieving multi-vendor equipment interoperability based on 3GPP standard ... We will continue to make efforts to launch commercial 5G network that offers the highest quality and stability.'

Vodafone Germany Launches 'First 5G Mast'

Vodafone Germany has announced that it has launched its first 5G mast, in Aldenhoven, covering a 400,000 square meter testing area. Railway company Deutsche Bahn and automobile firms e.GO, Audi and Continental have been named as the telco's first 5G partners, and the initial 5G demonstration involved a holographic

phone call between Vodafone Germany CEO Hannes Ametsreiter in Dusseldorf and a minibus belonging to electric vehicle manufacturer e.GO in Aldenhoven. Ericsson and Intel served as the technology partners for the test. Ametsreiter commented: 'We are the 5G partner of the German economy. We help trains to see dangers. We turn

the driver's seat into a TV couch in the car. We are turning Germany's industrial halls into smart factories with 5G. And we create new forms of communication with 5G – with holograms we turn boring video conferences into personal experiences.' 

REGULATORY NEWS

UAE's Regulator Signs MoU on Building Digital Development Co-operation with Cote d'Ivoire's Agency for Universal Service Telecommunications



The Telecommunications Regulatory Authority (TRA) of the United Arab Emirates has signed a Memorandum of Understanding (MoU) with Cote d'Ivoire's National Agency for the Universal Service of Telecommunications-TIC (ANSUT), in continuation of regulatory development efforts made by the Regulatory Authority for Telecommunications in Cote d'Ivoire (ARTCI). The MoU aims to foster and facilitate co-operation between the United Arab Emirates and Cote d'Ivoire in information and communications technology (ICT) sector development, promoting digitization, and for enabling future digital economic development between the leading Arab digital economy and the leading West African economy.

The agreement was signed on the celebrated UAE Flag Day during the ITU Plenipotentiary Conference 2018, which is currently being chaired by the TRA in Dubai and will continue until November 16th at the Dubai World Trade Centre. TRA-UAE, represented by H.E. Hamad Bin Obaid Al Mansoori, Director General of TRA, and ANSUT, represented by its CEO Mr. Euloge Soro-Kipeya along with Mr. Diemeleou Amon Gabriel Bile, Director General of ARTCI, formalized the co-operation framework between the two nations.

Cote d'Ivoire's thriving and digital communications-driven economy, in part, can be attributed to the role that the National Agency for the Universal Service

of Telecommunications (ANSUT) has been playing in the country ever since it was created by the Ivoirian government in March 2012. Through this international co-operation agreement signed with the TRA-UAE, ANSUT and Cote d'Ivoire's government look forward to creating new possibilities with the UAE on bilateral basis, and to help fulfill the UN's sustainable development agenda in the MEA region.

The MoU signed between the two countries in the presence of delegates from TRA-UAE, ANSUT, and ARTCI, is expected to also enhance foreign relations and bilateral ties between the two countries.

ITU Plenipotentiary Conference 2018 Endorses Harnessing New Technologies and Breaks ITU Records for Gender Parity

ITU's 20th Plenipotentiary Conference (PP-18) officially ended with Member States reaffirming their commitment to the common vision of a connected world, where information and communication technology (ICT) is a source for good for everyone, everywhere – and to the crucial mandate of the Union to realize this vision. "We have many challenges ahead of us. Far too many people around the world are still waiting to reap the benefits of the digital economy. Substantial digital divides still exist within and between countries. We need to continue our efforts to leverage ICT to accelerate progress towards the Sustainable Development Goals. I am pleased that PP-18 supports ITU's work towards this end," said Houlin Zhao, ITU Secretary-General. "The ICT sector has never been free of challenges. On the contrary! If I have learned one lesson in my journey in this sector - and as the Chair of PP-18 - it is that the need for performance advancement remains relevant, driven by the world around us," said H.E. Majed Sultan Al Mesmar, Deputy Director General of the UAE Telecommunications Regulatory Authority in his closing remarks. "In fact, the only thing that is constant in life is change. That's why we must always be ready to adapt to developments, and explore ways to increase flexibility and speed our work mechanisms in ITU and other organizations." "The PP-18 agenda focused on the UN Development Goals," said H.E. Hamad Obaid Al Mansoori, Director General of the Telecommunications Regulatory Authority (TRA) and Chairman of the Board of the

Mohammed Bin Rashid Space Centre on behalf of the host country UAE. "We have four years of work ahead on what has been decided in this esteemed conference. These pillars include digital divide, social integration, gender balance, digital literacy, enhanced international collaboration, digital commerce, electronic security, emerging technology and others," he said. The Plenipotentiary Conference (PP) is the supreme decision-making organ of ITU, a specialized agency of the United Nations. Taking place every four years, it determines the direction of the Union and its activities until the next PP. Most PP resolutions are open-ended, and ITU Member States evolve them to anticipate and respond to a fast-paced technology environment. While ITU's history is 153 years long, its spirit is young.

Big strides toward gender parity

The ITU Plenipotentiary Conference 2018 saw a number of breakthrough records towards gender parity. ITU Member States elected the first woman ever to one of five top management positions in the 153-year history of the organization. Nearly three out of 10 PP-18 participants were women, up from two out of 10 at the last Plenipotentiary Conference, held in 2014. In addition, for the first time in the history of ITU Plenipotentiary Conferences, ITU Member States elected more women than men to Committee Chairs, with four out of seven. They also elected three women to the Radio Regulations Board; for the past four years only two women served on the Board, which approves the Rules of Procedure in the application of the Radio

Regulations, the international treaty on the allocation and use of radio frequencies and the use of satellite orbits.

Main PP-18 decisions

Harnessing new technologies as a source for good

Sustainable Development Goals – ITU Member States approved the Union's Strategic and Financial Plan which sets the targets for 2020-2023, asserting ITU's role in facilitating progress towards the implementation of the Sustainable Development Goals through ICTs. These targets are divided into five strategic goals: growth; inclusiveness; sustainability; innovation; and partnership.

Innovation – ITU Member States also passed a new resolution to promote an enabling environment for telecommunication/ICT-centric innovation by small- and medium-sized enterprises (SMEs), start-ups, incubation centres and young entrepreneurs. SMEs are a source of new ideas and innovation, and often account for a significant proportion of the economy in developing countries. ITU Member States, therefore, also resolved to introduce reduced membership fees for them and to foster their participation within the context of ITU Telecom World.

Over-the-top services (OTTs) – The evolution of the telecommunication/ICT sector has led to new market structures, business models, investment strategies and revenue streams. OTTs, services that run "over-the-top" of existing telecommunications infrastructure, have played an increasing role. A new resolution recognizes the positive roles of OTTs in



fostering socioeconomic benefits and that mutual cooperation between OTTs and telecommunication operators can be an element to foster innovative, sustainable, viable business models.

Internet of Things – ITU Member States resolved to promote investment in the development of the Internet of Things (IoT), and smart sustainable cities and communities to support the Sustainable Development Goals. IoT refers to the network of computing devices with built-in smart sensors and software – enabling billions of devices and objects to connect with each other, collect real-time information and send this data, via wireless communication, to centralized control systems. These, in turn, manage traffic, reduce energy usage and improve a wide range of urban operations and services.

For everyone, everywhere

Future networks for developing countries

– ITU Member States resolved to continue ITU's work relating to the deployment of future ICT networks in developing countries. Future networks such as 5G are set to play a pivotal role in the digital economy. They will support applications such as smart homes and buildings, smart cities, 3D video, work and play in the cloud, remote medical surgery, virtual and augmented reality, and massive machine-to-machine communications for industry automation and self-driving cars.

Bridging the 'standardization gap' – ITU Member States resolved to promote the

increased participation of developing countries in ITU's standardization process so they can develop their digital economy faster. International standards, developed rapidly in line with the principles of global connectivity, openness, affordability, reliability, interoperability and security, are critical for generating confidence for investments in ICTs. International standards can be used to develop national standards which can help introduce or switch to new technologies in a timely manner.

Gender equality – ITU Member States resolved to strengthen efforts to make progress on gender equality within ITU and in the ICT sector, e.g. by reviewing their respective policies and practices to ensure that recruitment, employment, training and advancement of women and men in the ICT sector are undertaken on a fair and equitable basis.

Accessibility – ITU has been instructed to share best practices implemented in favour of accessibility to telecommunications/ICTs for people with disabilities and people with specific needs and to promote the collection and analysis of statistical data on disabilities and accessibility that Member States can consider when preparing and designing their own public policies to promote accessibility.

Safeguarding people against the risks from ICT misuse

Child online protection – Billions of children now use connected mobile devices, and

they are coming online at younger ages. While this opens new opportunities for innovative education, it also brings a variety of risks, ranging from cyberbullying to exposure to inappropriate and harmful content. ITU Member States resolved for ITU's Child Online Protection (COP) Initiative to work with Member States and partners to disseminate methodological frameworks for data production and statistics with the purpose of maximizing data comparison among countries.

Cybersecurity – ITU Member States have resolved to strengthen the role of ITU in building confidence and security in the use of ICTs, such as by promoting a culture in which security is seen as a continuous and iterative process and by supporting the standard-setting activities of ITU. The number, severity and diversity of cyber-threats and -attacks have increased. They can compromise the availability, integrity and confidentiality of critical information and infrastructure. They can impact countries' economic and social development.

The 20th Plenipotentiary Conference, held in Dubai from October 29 to November 16, 2018, closed with the signing of the Final Acts. The Conference, hosted by the United Arab Emirates, attracted more than 2300 participants from 180 countries, up from 171 countries in 2014. to introduce reduced membership fees for them and to foster their participation within the context of ITU Telecom World.

UAE TRA Confirms UAE 5G Spectrum Allocations



The Telecommunications Regulatory Authority (TRA) of the United Arab Emirates (UAE) has confirmed that it has issued 5G wireless spectrum to the country's two incumbent telcos, Etisalat and Du. According to a report from The National, the pair have been allocated frequencies in the 3.3GHz-3.8GHz range. Tariq Awadhi, executive director for spectrum management at the TRA, is quoted as saying: 'This year, Etisalat and Du have been officially allocated 100MHz each to establish a 5G network. To begin with, they have started establishing it commercially on a small scale. Currently, it is available for home broadband.' In January this year Etisalat said it had opened the Middle East region's first pre-commercial 5G networks at selected locations in Abu Dhabi and Dubai. Both Etisalat and Du have said they plan to launch limited 5G networks as a fixed broadband alternative until the first 5G mobile devices hit the market in 2019 or 2020. Besides the 3.3GHz-3.8GHz range, the TRA has said it is also looking at the 1427MHz-1518MHz and 24.25GHz-27.5GHz bands for 5G use, while it could also utilize spectrum above 40GHz after 2020.

The EU Parliament Passes Draft European Electronic Communications Code

It's been a while coming, but European Union's Digital Single Market (DSM) - or at least the strategy to create it - is taking shape with today's passing of a draft directive establishing the European Electronic Communications Code (EECC). The DSM strategy includes measures to support cross-border e-commerce, simplified VAT rules, ending geo-blocking and developing distinctly EU policies for the cloud, AI and competitiveness, some of which have already been advanced. The aims include hitting some new policy achievements by 2025: these will include gigabit speeds service for digital businesses and public sector institutions such as government bodies and schools; access speeds to at least 100 Mbps for all households, urban and rural by the same date, and 5G coverage for all major cities, roadways and rail lines. A host of other industry-focused fixes have also been included. There will be eased access to civil infrastructure and important network elements, such as in-building wiring or near-building distribution points. Allowing co-investment in fiber networks and imposing longer market review periods for standard regulatory decisions - five years rather than three is designed to provide more certainty for operators. There is to be a set a single EU voice termination rate. A

proposal to extend the minimum duration of spectrum licenses to 25 or 30 years was rejected and the final compromise was 20 years. But there was progress on naming the spectrum bands to be used for 5G. The 700 MHz band are to be released by mid-2020 to mobile operators, and the 3.5 GHz and 26 GHz frequencies will be made available by end-2020. Meanwhile OTTs are to be brought into the new code on things like providing customers with standard information on quality of service (same as access providers), and behavior expected on cancellation, equipment fees, and compensation provided for service failures. As to the crucial question: who wins and who loses? It looks like there's been something for everyone with no group feeling particularly stitched up. The big divide is, as always, between the infrastructure investors on one side and the competitive players and consumer advocacy groups (more or less) on the other. The infrastructure lobby seems relatively happy. "We believe the Code creates a more investment-friendly environment as well as ensures the regulatory certainty needed to foster efficient and competitive investments in future-proof digital infrastructures, not only from traditional business models but also from new innovative infrastructure models,

e.g. wholesale-only" stressed Ronan Kelly, President of the FTTH Council Europe. On the other side, the European Competitive Telecommunications Association (ecta) which pushes for more competition within the telecoms environment, also welcomed the positive vote, but warned that all will depend on the states' following through with implementation of the rules, rather than allowing themselves to be bullied by entrenched interests. "This is a good, necessary step forward. But without effective competition that guarantees high class connectivity on a sustainable basis for all, there's no such potential," observed ecta Director General Luc Hindryckx. "That is why the Member States and regulators must act to safeguard durable and effective competition as they translate the Code into practice. All anti-competitive loopholes must be closed. "Competition is what has driven both innovation and investment for the benefit of consumers and society at large. Still, competition is never a done deal. That is why we now stand ready to support European and national policy-makers. By making sure that the new rules are applied in a pro-competitive manner, ecta members and the wider industry can help turn the vision of a Gigabit society into reality."

TRAI Consults on OTT Regulation

The Telecom Regulatory Authority of India (TRAI) has published a consultation paper on the regulation of over-the-top (OTT) service providers, requesting feedback on how it should approach the sector. The paper highlights several imbalances between telecom service providers (TSPs) and OTT providers, with the former obliged to operate within a regulatory structure that imposes numerous requirements whilst the latter is largely unregulated. The TRAI suggests that the odds are currently stacked against TSPs, which must compete with OTTs for voice and messaging revenue, pointing out that: TSPs

bear the burden of investing in network infrastructure; although OTT traffic does drive data consumption, prices for data are rapidly falling, reducing the benefit to TSPs of carrying OTT traffic; OTT operators have access to additional revenue streams unavailable to TSPs, such as gathering and selling - or otherwise utilizing - customer data; and OTT providers are able to abuse dominant market positions, but with no mechanism to redress balance. No specific framework or solution is proposed by the TRAI, though the regulator presents several potential approaches, including those put forward by other regulatory

bodies across the world. The approaches broadly fall into two categories, either alleviating the pressures on TSPs to allow them to compete more effectively with OTT providers, or to apply equal regulation to OTT firms. The regulator also noted that a third option would be to leave the issue to be resolved by market forces, suggesting that the pressure from OTT providers would drive TSPs towards innovation and diversification. The TRAI has invited industry stakeholders to submit comments by 10 December, with counter-comments to be filed by 24 December.

GSMA Head calls for Digital Era Regulations



Operators are set to invest \$500 billion worldwide in mobile capex between now and 2020, but GSMA Director General Mats Granryd argued this will only be possible if regulations fit for the digital age are in place. Speaking in a keynote, Granryd explained such substantial investment requires “an environment that provides higher levels of certainty and consistency,” including the timely release of harmonized spectrum; approval of consolidation to drive investment while maintaining effective competition; and the ability to harmonize international privacy and data protection rules. Granryd also believes 5G and artificial intelligence (AI) are “mega trends” which will usher in a new era for the mobile industry: “This era will be defined

by highly contextualized and personalized experiences, delivered as and when you want them.” GSMA Intelligence forecasts that by 2025, there will be 1.3 billion 5G connections worldwide and not only will consumers enjoy “exciting, immersive experiences” via the next-generation technology, but for enterprises, network slicing will be a key solution to deliver smart capabilities. “We can create multiple virtual networks, addressing different market segments and use cases,” he said. As for AI, he stated it “goes beyond us as individuals – it is transforming industries. Self-driving cars are a great example, where AI will help to process the enormous quantities of data gathered.”

FCC Proposes Doubling Speed Requirement for Rural Broadband

The Federal Communications Commission is looking to raise the minimum rural broadband speed standard to 25 Mbps, more than doubling the current requirement. In general, this would boost speeds in rural areas that receive broadband through government-subsidized programs. Those government subsidies come from the FCC’s Connect America Fund (CAF). The

program is paid for through phone bill fees which the Commission then dips into in order to pass funds onto carriers so they can build networks in less populated, rural areas around the country. This increased standard will only apply to networks that are built in the future, however, so the FCC will continue to use different incentives to get ISPs to increase the speeds of existing

networks. By increasing the standard to 25 / 3 Mbps, the Commission is requiring rural areas to be supplied with the same broadband speeds as urban areas. The 25 Mbps would be the required download speed, and 3 Mbps would be the upload speed. “Rural Americans deserve services that are comparable to those in urban areas,” Chairman Ajit Pai said in a blog post today. Under different leadership however, Pai has criticized some of these speed increases. He supported moving rural speeds from 4 Mbps to the current 10 Mbps standard. But in 2015, when Tom Wheeler’s FCC increased the nationwide broadband standard to 25 Mbps, Pai objected. Now, Pai is seeking to apply that same urban standard to rural areas as well. Just last year, Pai sought to declare that the 10 Mbps speed on mobile devices was all the average consumer needed, and could be considered a substitute for in-home broadband services. That way, the Commission would be capable of saying that broadband was being deployed across the country at a reasonable pace. Pai backtracked on that after backlash.



DoT to Revisit Flat SUCs

India's Department of Telecommunications (DoT) is reportedly reconsidering the application of a flat annual spectrum usage charge (SUC) and is expected to contact the law ministry for its opinion on the matter, the Economic Times reports. SUCs currently vary, with different rates having been set for each auction. In 2016, though, the government had proposed setting a uniform rate of 4.5% with the charge to be applied to all existing spectrum licenses, lowering the fees for airwaves purchased at the most expensive auctions,

although some operators would have to pay more for frequencies purchased at certain auctions – most notably Reliance Jio Infocomm (Jio), which only pays a 1% SUC for the pan-India 2300MHz spectrum awarded in 2010. The DoT opted not to implement the measure, however, after a warning from the attorney general that the SUC for the 2010 auction could not be changed retrospectively, as it was part of a legal auction document. Instead, the DoT set floor rate of 3% of annual gross revenue (AGR) for spectrum across all

bands and set the SUC for spectrum sold in October 2016 to 3%, down from the 5% charged in the previous tender. The DoT is re-examining the issue as it believes that segregation of spectrum allocations will become increasingly difficult, with one official quoted as saying: 'Going forward, as airwaves become technology neutral, previously fixed SUCs might become outdated and it might be a good decision to just have a flat rate instead.' The revision of license fees and SUCs is a major goal of the government's new telecom policy.

EC Warns Croatia, Netherlands Over 700 MHz Delay

The European Commission is to initiate proceedings against two Member States for not complying with EU spectrum rules. Two letters of formal notice will be sent to Croatia and The Netherlands requesting full implementation of the European radio spectrum rules on the grounds of the 700 MHz Decision (EU) 2017/899. In line with these EU rules, Member States were obliged to adopt and make public their roadmap including detailed steps

for allowing the use of the 694-790 MHz (700 MHz) frequency band for mobile broadband by June 30th 2020. The due date to adopt and publish these roadmaps was at the end of June 2018. The States have either not adopted or published such a roadmap or they notified documents which do not fulfil the key requirements for a roadmap. Roadmaps serve to pave the way to 5G. As the roadmaps are not adopted, the development of 5G might be

delayed in Croatia, the Netherlands and its surrounding countries. 5G connectivity is one of the top priorities for the Commission, following the agreement of the future telecom rules – the Electronic Communications Code. The new rules will ensure that 5G radio spectrum is available in the whole EU by 2020. If Croatia and The Netherlands do not act within the next two months, the Commission may send reasoned opinions on this matter.

German Competition Body Wants to Review Vodafone-Unitymedia Deal

Germany's competition watchdog, the Federal Cartel Office (Bundeskartellamt), has asked the European Commission for permission to review Vodafone Group's proposed acquisition of cableco Unitymedia from Liberty Global. In May Liberty Global agreed to sell its operations in Germany, Hungary, Romania and the Czech Republic to UK-based Vodafone Group and the pair filed for EU antitrust approval

for the EUR19.0 billion (USD21.8 billion) deal last month. 'In our opinion, the case offers a partial referral. The effects of the merger affect Germany in particular. Here, the acquisition of Unitymedia could lead to very significant changes in the market conditions in the field of cable television and telecommunications, commented Andreas Mundt, President of the Federal Cartel Office. The European Merger Reg-

ulation provides that a procedure initially based on formal criteria, such as the turnover of the undertakings concerned, the European Commission, may, under certain conditions, be referred, in whole or in part, to one or more Member States. In the case of a referral, the competition authority of the Member State will conduct the merger control review in accordance with its respective national competition law.

Thailand to Auction Remaining 35MHz of Bandwidth in 1800MHz Spectrum in 2019

Thai telecom regulator National Broadcasting and Telecommunications Commission (NBTC) plans to sell the remaining 35MHz of 1800 MHz spectrum

bandwidth in February 2019, Bangkok Post reports. The 35MHz of bandwidth (35x2MHz, upload and download) to be put up for sale in Thailand's next auction

is part of Total Access Communication's 1800MHz licence, which expired in September this year.

Rescue Act

Voda Idea chairman **Kumar Mangalam Birla** met top finmin officials

Warns of company missing spectrum-linked payment of **₹900 CR** due in March



Voda Idea seeks to make payment in **12 instalments**

Govt feels sentiments will be hurt if largest telco fails to pay on time

Unlikely to offer relief to one telco; industry-wide solution expected



India Mulls Spectrum Payment Term Relief

The Indian government is considering easing the terms for spectrum-related payments for the telecoms industry, which is facing declining profitability and rising debt levels, after Vodafone Idea requested relief. Kumar Mangalam Birla, chairman of the country's largest operator Vodafone Idea, held discussions with finance ministry officials to seek more time to make spectrum-related payments of INR9 billion (\$126 million) due in March 2019, The Economic Times (ET) reported. He reportedly is looking to make payments in 12 instalments. A ministry official told ET Birla warned the newly merged company, which reported a loss of INR49.7 billion in its fiscal Q2 2019 (the three months ending 30 September), was in danger of missing the March payment. Seeking to avoid a default, which would hurt confidence across an industry struggling due to a two-year price war, officials from the finance

and telecoms ministries met to discuss creating a rescue plan, which would need to be extended to all operators, the newspaper said. ET cited another official as saying: "We don't want a default; we will work out something," adding staggered payments is an option. Vodafone Idea said last week it will explore raising up to INR250 billion in new capital. But some analysts think the infusion may only offer short-term relief as margins and turnover are forecast to weaken further. Rival Bharti Airtel, now the second-largest mobile player in the country, suffered another quarter of falling profit and revenue in its fiscal Q2, led by a double-digit drop in sales and a sequential decline in subscribers in India. Its net profit for the quarter ending 30 September dropped 65.4 per cent year-on-year to INR1.19 billion, with total revenue down 6.2 per cent to INR204 billion.

BTRC to Rank Telcos, ISPs Based on Service

The Bangladesh Telecommunication Regulatory Commission will rank telecom and internet service providers based on different evaluation methods, including customer surveys, inspections, audits and test drives. The telecom regulator is also considering to publish the final evaluation report on its website or through the media to raise public awareness and create a competitive environment conducive for better service. The BTRC yesterday issued a gazette notification on this in its first regulation to fix the service quality issue. The gazette, signed by Md Jahirul Haque, acting chairman of BTRC, also declared a minimum of 7 mbps internet downlink speed in fourth generation (4G) data services as the standard and an uplink speed of 1 mbps. For 3G, the minimum downlink speed was set at 2 mbps and uplink speed was 128 kbps. Under the regulation, the telecommunication and internet service providers (ISP-) will have to pay a penalty of up to Tk 100 crore

for non-compliance. According to the new parameters, for mobile services, the maximum rate for call drops was set at two percent while the call setup success rate should remain above 97 percent. Operators should ensure that their networks are ready to setup a call within seven seconds. In terms of customer care, 90 percent of the complaints should take an average of 40 seconds to be heard. At the same time, the BTRC has fixed five working days to resolve the complaints. Operators also need to maintain speeds of 80 kbps 2G internet service downlink and 20 kbps uplink, according to the regulation. Besides, the broadband service providers will have to maintain an average of less than 5 mbps download speed and 1 mbps upload speed. "This regulation was long overdue," said Haque. "Operators will have to comply with this and if they fail their names will be published." Haque said early different guidelines and directives on the benchmarks of quality

of services were all combined to make the regulation. Every service provider has to meet the quality standards in their entire service area. Senior officials of the telecom watchdog said they would run their own test drives or appoint a third-party to measure the service quality, which will be used for preparing the evaluations. However, mobile operators criticized the different parameters set. They said that regulators running test drives on individual networks was not practiced anywhere in the world and BTRC should test its own network system. Regarding the customer survey, regulators will a rating system using five and it will be marked between 5-1, with 5 being the highest mark obtainable. Currently, there are about 500 service providers in the country, including telecoms, internet services providers, WiMax and land phone operators, included for the quality check. The new regulation will be imposed on all of them, although the parameters are different.

Government Telecom Unit Seeks Regulatory Authority Over ISPs, IIGs

National Telecommunication Monitoring Centre, ahead of the national polls, has requested Bangladesh Telecommunication Regulatory Commission to empower it with regulatory authority over Internet Service Providers and International Internet Gateway operators. NTMC, which is under the home ministry and comprised of officials of security forces and law enforcing agencies, makes the plea as the entity has been facing difficulty in carrying out its activities for different reasons, including incapacity of the ISPs and IIG operators to provide support, sources have said. NTMC provides lawful interception service to law enforcing and detective agencies of the government for preventing misuse of ultramodern information technology by terrorists, and collecting, analyzing, identifying and evaluating information related to such activities. NTMC in its letter to BTRC has mentioned that the government and the home ministry have allowed the entity to establish integrated

lawful interception system to carry out its activities. International internet gateway operators, internet service providers, broadband wireless access, national internet exchange, internet protocol telephony service provider, public switched telephone network and mobile network operators will be connected to the system. NTMC in its letter to the commission also says that some ISPs and IIGs have not yet complied with their respective licensing guidelines and some legal ISPs are providing service to illegal operators, obstructing their usual course of action. It mentions that facebook, whatsapp, twitter, personal blogs and some other social media platforms are used to spread information demeaning the government. NTMC in the letter observes that ahead of the national polls, it has become urgent for the entity to provide law enforcing agencies with lawful interception facility to ensure prevention of such activities. In this context, the letter has requested the

telecom regulator to delegate regulatory power to NTMC over ISPs and IIGs under section 97(ka) of telecommunication act. Asked about the NTMC plea, BTRC officials have said that the work of the commission is to maintain discipline in the telecommunication sector but delegation of regulatory power to NTMC will create a dual regulatory authority. On other hand, NTMC has already been enjoying power over the licensees that allows the government's surveillance unit to give order or instruct ISPs and IIGs. Apart from this, NTMC can inform BTRC for taking measures against any entity if it does not comply with the order or instruction, the BTRC officials mention. Earlier in October this year, BTRC has turned down a request of NTMC to get nationwide telecommunication transmission network license. The commission, however, decided to support NTMC in ensuring smooth connectivity of the unit's system with all the telecom service providers.

Court Frees KPN from Remaining Fixed Voice Regulations

Telecom Italia, which operates under the TIM brand, has been named as the highest bidder in Italy's auction of 5G wireless spectrum. The Ministry of Economic Development (Ministero dello Sviluppo Economico, MiSE) has revealed that TIM made opening bids totaling EUR951

million (USD1.1 billion) for spectrum in the 700MHz, 3.6GHz and 26GHz bands. Meanwhile, Iliad, which launched mobile services in Italy in May, has so far offered EUR749 million for frequencies, including EUR676.5 million for a block of 700MHz band spectrum which has been reserved for

a new market entrant. Wind Tre, Vodafone and Fastweb round out the bidders, with a total of EUR2.48 billion having been offered by the five participants. The competitive phase of the auction begins on September 13.

Iliad Could Challenge License Extension in Court

Reports from Italy suggest that the Communications Regulatory Authority (Autorita per le Garanzie nelle Comunicazioni, Agcom) could face a legal challenge if it goes ahead with a plan to extend 3.5GHz (3.4GHz-3.6GHz) wireless broadband licenses for a further six years, to 2029. As reported by CommsUpdate in October, the renewals are already being looked at by a group of politicians who have queried why licenses in the 3.5GHz band would be extended when concessions in the 3.7GHz range (3.6GHz-3.8GHz) were

recently sold at auction and raised EUR4.35 billion (USD4.93 billion). CorCom writes that French-owned firm Iliad is leading the telco challenge against the renewals, threatening legal action in the regional court (Tribunale Amministrativo Regionale, TAR) if Agcom proceeds with its plan. Iliad was one of five companies that bid a total of EUR6.55 billion in the government's auction of 5G-capable spectrum in the 700MHz, 3.7GHz and 26GHz bands, which ended in early October. The fixed-wireless concessions in the 3.5GHz range

were awarded in 2008 and are held by GO internet, Tiscali, Linkem, Mandarin and Telecom Italia (TIM). They are due to expire in 2023 but earlier this year it emerged that licensees had approached Agcom to extend the permits for a further six years. CorCom reports that TIM's license is the only one which would not be extended due to competition concerns. Swiss-owned ISP Fastweb has offered to acquire the fixed-wireless business of Tiscali for EUR150 million, but this deal could be derailed if Tiscali's license is not extended.

GSMA Asia-Pacific IoT Group Expands

The GSMA announced 14 operators across Asia-Pacific joined its APAC IoT Partnership Program, which is designed to drive development of the IoT market across the region. In a statement, the GSMA said Celcom Axiata; Dialog Axiata; dtac; M1; Maxis; Ncell; Optus; Robi Axiata; Smart; Smartfren; Singtel; True; XL Axiata; and Xpand joined. It added the programme is currently the largest IoT community in Asia-Pacific, with more than 500 partners comprising mobile operators, manufacturers, developers and others. The program is designed to foster IoT in Asia-Pacific, which is currently the largest IoT market in the world. GSMA Intelligence predicted the region will account for 11 billion connections and represent a revenue opportunity of \$386 billion by 2025. Julian Gorman, head of Asia-Pacific at the GSMA, said IoT is growing "rapidly" across the region, with mobile operators working alongside their partners and the wider ecosystem to drive this expansion. "This program will support the development of the IoT by creating a

cross-regional IoT community to facilitate collaboration and knowledge sharing, as well as creating opportunities that benefit both the supply chain and their customers," explained Gorman. The GSMA added a major focus of the initiative are IoT labs, which are being set up by operators across the region to encourage the development of new IoT products and services. Initially, the labs, which are a "key requirement" for collaboration and to encourage new IoT

use cases, will be available to partners and customers in Australia, Bangladesh, Cambodia, Indonesia, Malaysia, Nepal, Singapore, Sri Lanka and Thailand. As part of the program's requirements, all participating operators have signed a memorandum of understanding to ensure that the coordination and output among the IoT Labs is consistent with global and regional standards.



Trump Signs Order to Set U.S. Spectrum Strategy as 5G Race Looms

U.S. President Donald Trump signed a presidential memorandum directing the Commerce Department to develop a long-term comprehensive national spectrum strategy to prepare for the introduction of next-generation 5G wireless networks. Trump is also creating a White House Spectrum Strategy Task Force and wants federal agencies to report on government spectrum needs and review how spectrum can be shared with private sector users. The memorandum requires a series of reports over the next nine months and looking at ways and existing efforts on increasing spectrum and sharing existing spectrum. A long-term strategy is due by July. The goal is to ensure there is enough spectrum to handle the growing amount of internet and wireless traffic and that future faster 5G networks have adequate spectrum. The White House also said Trump is withdrawing presidential memorandums on spectrum signed by then-President Barack Obama in 2010 and 2013. AT&T Inc,

Verizon Communications Inc, Sprint Corp and T-Mobile US Inc are working to acquire spectrum and beginning to develop and test 5G networks, which are expected to be at least 100 times faster than current 4G networks and cut latency, or delays, to less than one-thousandth of a second from one-hundredth of a second in 4G, the Federal Communications Commission has said. Wireless industry trade group CTIA praised the administration for "recognizing the importance of establishing a national spectrum strategy. With the right approach based on licensed wireless spectrum, America's wireless carriers will invest hundreds of billions of dollars and create millions of jobs." White House officials said they do not support any effort to nationalize the 5G network. A leaked document in January suggested the administration was considering the idea. "We will prioritize efforts to accelerate the private sector's development of 5G, so that the American people can reap the

rewards of this incredible technology," White House adviser Michael Kratsios told reporters on Thursday. Democratic Federal Communications Commissioner (FCC) Jessica Rosenworcel questioned the length of the time for the reports. "Other nations are moving ahead while we're headed to study hall - and in the interim we're slapping big tariffs on 5G networks. This doesn't speed our 5G leadership - it slows us down," she said. One big issue is a band of spectrum reserved for automakers to enable vehicles to "talk" to one another that has gone largely unused. Cable companies and others want the FCC to award part or all of that to expand Wi-Fi. The FCC voted to open additional spectrum for use by unlicensed devices in the 6 GHz band, or five times the current spectrum available. Unlicensed devices include things such as Wi-Fi routers, connected home appliances, baby monitors, fitness trackers, garage door openers and cordless landline phones.

Court Frees KPN from Remaining Fixed Voice Regulations

The Netherlands' Trade & Industry Appeals Tribunal (College van Beroep voor het bedrijfsleven, CBB) – the country's apex court in telecom regulation matters – has upheld an appeal by incumbent PSTN operator KPN and removed its remaining wholesale fixed telephony regulatory obligations, with effect from 1 April 2019. The Authority for Consumers and Markets (Autoriteit Consument & Markt, ACM) had issued a decision on 23 February 2017 to continue regulating KPN's wholesale services in the 'dual call' market (which includes business end user ISDN1/ISDN2 lines alongside IP lines supporting two simultaneous calls ['VoB2']) for three years ending March 2020, as it decided KPN retained a dominant position in the

segment. The CBB has overturned this analysis, deciding that KPN cannot be declared a dominant operator beyond March 2019 due to factors including ISDN user decline and decommissioning in favor of IP-based services alongside the availability of competing services including those of chief rival VodafoneZiggo (with a cable/IP network reaching over 90% of the country). Other aspects of ACM's February 2017 market analysis decision removed KPN's regulatory obligations (including access and tariff obligations) in the wholesale fixed telephony markets for 'single call' services (consumer/small business basic PSTN and single-channel IP lines) and 'multiple call' services (corporate/public sector) from March 2017

onwards, due to sufficient competition in those markets. Furthermore, ACM's decision withdrew KPN's obligations in the retail markets for dual and multiple call services from March 2017 (whilst the retail market for single call services had already been deregulated under ACM's previous May 2012 fixed telephony market analysis ruling). The CBB's latest decision (issued 6 November 2018, see link below) separately included rejections of the appeals of Tele2 NL and Pretium; these competitors had disagreed with ACM's 2017 market analysis and wanted additional regulation imposed on KPN, having argued that the telco remained dominant in the single call services market.

FCC Relaxes Business Data Price Regulation for Rural Carriers

The FCC voted to relax business data price regulation for certain rural carriers. Rate of return carriers that opted to receive Universal Service Fund support based on the FCC Alternative Connect America Cost Model (A-CAM) will have the option of transitioning to what the FCC called "light-touch incentive regulation" for their business data services. Those services include lower-speed TDM data services that operate at speeds of 45 Mbps or less. If a market test demonstrates that a participating carrier has competition for those lower-speed TDM services, those services will be exempt from "ex ante" pricing regulation. That type of regulation is based on forecasts and other paperwork that carriers traditionally have been required to submit to regulators. The new order adopted at today's FCC meeting also

calls for participating carriers' packet-based business data services to be automatically exempt from ex ante price regulation. Carriers receiving USF support through the Alaska Plan also are eligible for the new business data pricing options, as are certain companies affiliated with price cap carriers. Price cap carriers already have gained a large measure of regulatory relief on their business data pricing. The FCC also adopted a further notice of proposed rulemaking that seeks comment on creating a pathway for deregulating business data pricing for ROR carriers that do not receive support based on A-CAM. The new ROR business data framework adopted today gives participating carriers the ability to offer volume and term discounts and individualized contract offerings for lower-speed data services,

the FCC noted in a press release. "By modernizing the rules for carriers that receive USF support, we can provide the right incentives for carriers to bring broadband to homes and businesses in the hardest to serve parts of the country," argued FCC Commissioner Brendan Carr at today's FCC meeting, where the new ROR business data framework was adopted. Deregulating ROR business data pricing will "eliminate the need for expensive cost study filings, as well as compliance with cost assignment and separation rules," said Carr. "The resulting savings can then be passed along to consumers." The FCC originally proposed deregulating business data services for A-CAM carriers earlier this year.

Agcom Rules that Vivendi no Longer Dominant at TIM

French firm Vivendi has been ruled to no longer have control or a dominant influence at Telecom Italia (TIM). Reuters reports that Italy's Communications Regulatory Authority (Autorita per le Garanzie nelle

Comunicazioni, Agcom) made its decision in July, but the ruling has only just been made public. In May this year Vivendi lost its majority presence on TIM's board after US investment group Elliott narrowly won

a shareholder vote, allowing it to nominate ten of the 15 board members. Vivendi remains TIM's largest single shareholder, with a stake of around 24%.

GSMA Issues 5G Spectrum Warning

The rollout of 5G will be at risk if operators do not get timely access to the right spectrum, industry body GSMA warned as it called on governments to strongly support the sector's needs over the next year. In a statement, the GSMA highlighted a growing need for governments, regulators and the industry to work together to deliver widespread coverage of the new technology, as the race to launch 5G services intensifies with one year to go until the World Radiocommunication Conference 2019 (WRC-19). The WRC conferences, held every three-to-four years, are used to review and possibly revise global spectrum regulations. The next event will be held during October 2019 in Sharm el Sheikh, Egypt, with a strong focus expected on 5G suitable frequencies given many leading countries are gearing up to launch the technology over the next two years. In its GSMA Public Policy Position on 5G Spectrum report, the GSMA highlighted several key considerations for governments and regulators including: the need for wider frequency bands to support higher speeds and increased traffic volumes; and the need for 5G spectrum to cover three key frequency ranges to deliver widespread coverage and support all use cases. On the first point, the GSMA said regulators which make 80MHz to 100MHz of spectrum available per operator in prime

5G mid-bands (for example 3.5GHz) and around 1GHz per operator in mmWave bands "will support the very fastest 5G services". For rural, urban, suburban and IoT services, GSMA said sub-1GHz spectrum should be used to extend high-speed 5G mobile broadband coverage, while spectrum from 1GHz to 6GHz will offer a good mix of coverage and capacity for 5G. Spectrum above 6GHz can be used for services such as high-speed broadband. At WRC-19, the GSMA added it was essential for governments to support the 26GHz, 40GHz (37GHz to 43.5GHz) and 66GHz to 71GHz bands with a sufficient amount of harmonized 5G spectrum "critical to enabling the fastest 5G speeds, low-cost devices and international

roaming, and minimizing cross border interference" Finally, governments should avoid inflating 5G spectrum prices, and avoid setting aside spectrum for verticals in key bands where the Association said sharing approaches such as leasing "are better options where vertical industries require access to spectrum". Brett Tarnutzer, head of spectrum at the GSMA said operators urgently need more spectrum, with the future of 5G heavily dependent on the decisions governments "are making in the next year as we head into WRC-19". "There is a real opportunity for innovation from 5G, but this hinges on governments focusing on making enough spectrum available, not maximizing auction revenues for short term gains."



C-Band Alliance Increases FCC Proposal for Spectrum Repurposing

The C-Band Alliance (CBA) has announced that up to 200 MHz of mid-band (C-band downlink) spectrum could be cleared, dependent upon demand, under its updated proposal to the US Federal Communications Commission (FCC) opening new spectrum to support 5G wireless deployment while protecting current users, the company said. This updated commitment will be reflected in comment filings due October 29 under the FCC Notice of Proposed Rule Making (NPRM) proceeding. The proposal increases by 80% the amount of spectrum that could be made available

for 5G terrestrial use as compared to the initial proposal made by Intelsat and SES. The CBA, the entity that will be able to facilitate safe and efficient clearing and repurposing of C-band downlink spectrum, was formed by Intelsat, SES, Eutelsat and Telesat, the continental US satellite services operators. The group's proposal is the only one that balances the needs to protect the C-band user community, which includes television and radio programming distribution to over 100 million US homes, as well as private commercial and government media and data networks with the

strong public interest need for rapid 5G network deployment across the US. The C-Band Alliance, or CBA, was established by Intelsat, SES, Eutelsat and Telesat to implement the safe and efficient clearing and repurposing of C-band spectrum, supporting the United States in its goal of leadership in 5G deployment and innovation. While implementing the breakthrough, market-based proposal to clear spectrum, the CBA will also protect the quality and reliability of existing C-band services, providing current users certainty and operational integrity.

TRAI Plans Consumer Outreach Program on New Broadcasting Framework

Telecom regulator TRAI is planning a consumer outreach program, starting this month, to create user awareness on the nuances of its new tariff order and framework for broadcasting sector, a senior official said. TRAI's move comes just days after the Supreme Court dismissed a plea challenging the Telecom Regulatory Authority of India's (TRAI's) March, 2017 regulations and tariff order relating to fixation of charges for free and pay channels. "For consumers, we will have an outreach program on the new broadcasting framework. We will explain the new regulations to the consumers, what are their rights and also resolve queries, if any," TRAI Secretary S K Gupta told reporters here. The modalities of the consumer outreach program is currently being worked out, Gupta said adding that Delhi, Jaipur and other locations are

being considered for the same. Last week, the Supreme Court paved the way for the implementation of TRAI's new tariff order for the broadcast sector. TRAI's framework of July, allows consumers to select and pay only for the channels they wish to view, and requires TV broadcasters to disclose maximum retail price (MRP) of channels individually and that of bouquets. The order will provide offer consumers a choice, bring transparency and better service quality, TRAI Chairman R S Sharma told reporters here. The regulations are "consumer-friendly", as they give people choice to subscribe to channels they want to see, and not be unnecessarily thrust channels in the name of bouquets, he said. Also, Free To Air channels by broadcasters will be free to air even for consumers. "Every channel's maximum retail price (MRP) will be displayed

individually in electronic program guide so that people will be able to subscribe to individual channels also," Sharma said. The top court's judgment, last week, came on a plea by Star India Private Limited challenging the Telecommunication (Broadcasting and Cable) Services (Eighth) (Addressable Systems) Tariff Order, 2017 and the consequential Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) Regulations, 2017. Among others, the TRAI regulations said channels when given in bouquets should not be a mix of pay channels and free to air channels, and mandated that a bouquet should not contain any pay channel where the maximum retail price was more than Rs 19.

Ofcom Plans Unrestricted Access to Openreach Ducts/Poles; News Follows BT/Openreach 'Legal Separation'

UK telecoms regulator Ofcom has issued proposals to give greater access to national wholesale broadband network provider Openreach's underground ducts and telegraph poles for companies laying high speed fiber cables used by large businesses, mobile operators and broadband providers. The announcement follows a disclosure in July setting out long-term plans to support investment in fiber networks, including introducing unrestricted access to Openreach's ducts and poles in 2019. Under Ofcom rules, Openreach – which is owned by BT Group but independently governed – is required to let competing providers use its poles and ducts to lay their own fiber cables, which can cut the upfront cost of building

full-fiber networks by around half, though this obligation is currently restricted to companies offering primarily residential broadband services. Ofcom is consulting on proposals to expand this access to companies offering any type of telecoms services including high speed lines for large businesses, networks carrying data for mobile operators and high capacity lines supporting broadband services. The watchdog intends to implement unrestricted duct access from spring 2019. The news follows BT Group's formal release on 31 October 2018 from a set of regulations ('Undertakings') imposed in 2005, with the effect that Openreach is now regarded as a 'legally separate' company from its parent and subject to

a different set of regulations from BT. The ending of the legacy regulation was granted following the transfer of 31,000 employees from BT to Openreach in early October 2018 – which was the last primary obstacle to full implementation of Ofcom's 'legal separation' orders issued to BT/Openreach in 2016. Ofcom's latest duct and pole access plans were published on 2 November 2018 alongside a consultation on Ofcom's Business Connectivity Market Review, which looks at competition for dedicated, high speed leased lines (see link below for further details). Both consultations will close on 18 January 2019, and Ofcom intends to publish final conclusions in spring 2019.

4 Firms Get Mobile Phone Tower Sharing License

Bangladesh Telecommunication Regulatory Commission (BTRC) today issued licenses to four firms to operate tower sharing companies in the country's telecommunication sector. The firms are edotco Bangladesh Tower Company Limited, TASC Summit Tower, Kirtankhola Tower Bangladesh Limited and AB HiTech Consortium Limited. Posts, Telecommunications and Information Technology Minister Mustafa Jabbar handed over the licenses to the winning firms at a ceremony at BTRC Conference room, reports BSS. Edotco Bangladesh Country Manager Rahul Chowdhury, TASC Summit Tower Managing Director Arif Al Islam, Kirtankhola Tower Bangladesh Managing Director Salman Karim and AB HiTech Consortium Managing Director Fazlur Rahman Molla received the license on behalf of their respective companies. Mentioning that Bangladesh attained another milestone in information technology and telecommunication sector

through this tower sharing licenses, Mustafa Jabbar said: "We've seen that no legal issue is pending now. So, it is needed to work on old issues such as ILDS policy, telecom act etc." Congratulating the license awardees, the minister said: "The objective of this license has to be kept in mind. The mobile phone operators have been expanding network till this date by building towers. Now I would request them (tower companies) to roll out network. MNOs could strengthen their efficiency in other sectors not making investments in tower." Posts and Telecommunications Division Secretary Shyam Sundar Shikder said: "Everyone knows how much work the government has done towards building a digital Bangladesh . . . those who got license, I hope, would contribute further in the development of the country." Expressing optimism that telecom service would be better after starting works of the companies, BTRC acting Chairman Jahurul

Haque said: "As per the licensing guidelines, tower companies have to go to all upazilas in the next five years." According to the guidelines, the MNOs cannot set up any tower on the basis of roll out of tower companies. Besides, any MNO cannot rent tower to another MNO but they can sell the tower to the tower companies. Earlier on August 16 this year, the telecom regulator issued "notification of award (NoA)" for the licenses to the four firms. Before the NoA, BTRC in a special commission meeting had finalized the name of the four firms following the evaluation under "beauty contest" manner and forwarded those to the posts and telecommunications division (PTD) for the final approval. Officials said the decision was finalized based on a report of the 15-member evaluation committee which scrutinized the applications as per the tower sharing licensing guidelines. Currently, there are 30,000 towers in the country. The telecom regulator received eight applications for the licenses, within the extended deadline of June 11 this year. As per the guidelines, license acquisition fee has been set at Taka 25 crore while annual renewal fee Taka 5 crore. Besides, the licensees will have to share 5.5 per cent of their revenue with the government and another 1 per cent with the social obligation fund from the second year of the licenses. Each licensee will also have to deposit Taka 20 crore as performance bank guarantee and BTRC regulator would encash up to 50 percent of the performance bank guarantee phase by phase in case of licensee's failure in complying with roll-out obligations. Initially, the license tenure would be 15 years which would extend gradually by five years.



TOT, CAT Spectrum Rights to Remain Unchanged Post-Merger

Thailand's National Broadcasting and Telecommunications Commission (NBTC) has concluded that a proposed merger between state-owned CAT Telecom and its sister fixed line operator TOT will not conflict with Section 46 of the NBTC Act in terms of the two companies' existing frequency allocations, with their spectrum rights set to remain unchanged post-

merger. The Bangkok Post writes that the new resolution comes after the Digital Economy & Society Ministry sent a letter to the NBTC in September, asking for clarification on the impact of the planned merger on spectrum rights. Further, the working panel handling the merger process for the ministry requested feedback on the effect of the merger on legal obligations

of existing disputes between the two enterprises and between TOT and private companies. The Office of the Attorney-General (OAG) is yet to publish a response regarding the matter. The DE Ministry is aiming to submit a CAT/TOT merger plan for cabinet approval by the end of this year.

Verizon: We're ready to Go with 3.5 GHz, Will Be Primarily Outdoors

Verizon said it's ready to deploy 3.5 GHz CBRS services now, and it expects to initially use the band for outdoor coverage. Verizon's Bill Stone, VP of the carrier's technology planning and development, provided additional insights into the operator's 3.5 GHz plans here at the FierceWireless Next Gen Wireless Networks Summit. His comments are particularly noteworthy considering the FCC is scheduled to vote on final rules for the 3.5 GHz band during the agency's open meeting next week. The vote—most industry observers expect the agency to approve the proposed rules—likely will pave the way for the wireless industry to take its first concrete steps toward commercial wireless services in a band that was once reserved exclusively for the U.S. Navy and other military operations. The

FCC is voting on rules that would release spectrum in the band for commercial use through a first-of-its-kind sharing technology. "It's a very new and unique band," Verizon's Stone said. "I'm pretty excited about 3.5 GHz." Added Stone, "We are ready to go when the FCC gives us the green light." Further, Stone explained that Verizon views the 3.5 GHz band initially as an "outdoor play" that the carrier will enable largely through the small cells it is deploying in cities across the country. "It's a very economical way to add capacity outdoors," he said, adding that Verizon likely would employ carrier aggregation technology in the 3.5 GHz band in order to provide additional capacity to customers. Carrier aggregation technology allows wireless network operators to essentially "glue" together disparate spectrum bands

in order to provide faster services, much like adding additional lanes of traffic to a freeway. Stone explained that Verizon would likely use the General Authorized Access (GAA) iteration of 3.5 GHz first—the FCC is planning to release CBRS spectrum first in the mostly unlicensed GAA format and then, later, in the licensed Priority Access Licenses (PAL) format. However, Stone warned that "right now there are no devices that support the CBRS band," he said. "They're lined up and ready, they're just not here yet." He said he expects CBRS devices to begin to hit the market next year, and he said that customers who choose to upgrade to those devices "are going to benefit significantly" from faster connections. Verizon isn't the only company promising to immediately take advantage of 3.5 GHz spectrum. "We know we're ready. We've done 50-plus trials," said Kurt Schaubach, CTO of Federated Wireless, one of the companies that is selling database technology that will manage sharing among users in the 3.5 GHz band. And network construction company ExteNet Systems is also ready to deploy CBRS systems. ExteNet's Jeff Alexander said that the company is testing 3.5 GHz systems in several sports stadiums and, if the company received approval to do so, he said ExteNet "could be ready on several stadiums easily by the end of the year." Verizon of course isn't alone in its plans to deploy services in 3.5 GHz. AT&T last month announced that it selected Samsung and CommScope to supply its first 5G-ready CBRS network solution; the operator has said it plans to initially use 3.5 GHz spectrum for its ongoing fixed wireless service buildout.



Government to Keep Ownership of MegaCom

The current position of Kyrgyzstan's government regarding the mobile operator MegaCom is to keep it as a state-owned company, Chairman of the State Property Management Fund Renat Tuleberdiev has told members of parliament, Akipress.com reports. The Fund has failed in several attempts to sell the 100%-owned cellco,

with no adequately qualified bidders coming forward, and the government now appears to have suspended the sale plan. In a similar statement reported earlier this month by Sputnik.kg, Tuleberdiev told a press conference that he wanted to keep MegaCom on the balance sheet of the Fund, adding that the government's draft

privatization program for 2018-2020 was still yet to be approved, and any new sale proposals could only be envisaged after finalization of this plan. The chairman also stressed that MegaCom is one of the country's most profitable companies with state ownership. 🇰🇬

A SNAPSHOT OF REGULATORY ACTIVITIES IN SAMENA REGION



Bahrain

In recognizing the efforts of the Telecommunications Regulatory Authority of the Kingdom of Bahrain ("TRA") which have demonstrated the greatest commitment to developing regulations aiming at ensuring a secure and advanced telecommunications infrastructure, CommsMEA announced TRA Bahrain as a winner of the "Regulatory Initiative of the Year" Award for 2018 in the 13th edition of the annual CommsMEA Awards on Wednesday, November 14, 2018 in Dubai - UAE. This award, won by TRA comes in acknowledgement of its keenness towards prioritizing the deployment of public radiocommunications stations and the recent issuance of the Public Radiocommunications Stations Regulation. This is an essential step towards enabling the deployment of future wireless technologies using the state-of-the-

art stations but in the same time considering public concerns and environmental impacts TRA's Acting General Director Sh. Nasser Bin Mohamed Al Khalifa commented in regard of this saying, "It gives me pride to receive this award which serves as a reminder of TRA's and Bahrain's persistent commitment to excellence and innovation. There is no doubt that this Regulation is placing the Authority in a pioneering position within the MENA region with respect to the effective deployment of wireless stations". "The Regulation assigns TRA to deploy a fully automated permitting system that reduces the lead-time to market and encourages increased sharing practices of new and existing stations". Sh. Nasser added.

(November 21, 2018) tra.org.bh



Bangladesh

Bangladesh Telecommunication Regulatory Commission has started measuring the level of radiation emitted from base transceiver stations of mobile phone operators on trial basis with its newly imported devices. The commission has so far checked radiation level in a couple of places in Dhaka last week, a senior BTRC official told New Age on Sunday. The commission would check radiation level based on complaints as the BTRC officials are now ready to operate the equipment, he said. As the guidelines on limiting radiation from BTSs of mobile phone operators are yet to be finalized eight months after drafting, the telecom regulator is following standards set by the International Telecommunication Union, World Health Organization and International Commission on Non-Ionizing Radiation Protection in measuring the level of radiation. Until the guidelines are finalized, the commission would continue to follow the standards set by ITU, WHO and ICNIRP in determining whether the mobile phone operators or any other organizations are emitting any sort of harmful radiation or not, the BTRC official said. The commission would take measures as per the existing rules and regulations if any sort of harmful radiation is detected in the frequencies of the mobile phone operators or any other organizations, he said. He said that the newly installed radiation measurement tools were capable to detect the bandwidth which was responsible for harmful or high radiation emission. In a particular area, different types of spectrum bands might be responsible for creating radiation and the BTRC's equipment would suggest which bandwidth is responsible for

creating high or harmful radiation, the official added. The mobile phone operators, however, have claimed that the frequencies used by the operators do not create any radiation harmful to human health. BTRC initiated the move to measure radiation of the radio frequencies following an instruction from the High Court in March, 2017. Following a petition filed by Human Rights and Peace for Bangladesh, HC asked the telecom regulator to take preventive measures if any harmful radiation from the mobile towers was found. BTRC was also asked to formulate guidelines on the use of towers by mobile phone companies. As part of its move to check whether there is any harmful radiation by the mobile phone towers, it completed procurement of radiation measurement tools last month. BTRC procured two radiation measurement tools along with two monitoring vehicles for around Tk 2.92 crore.

(November 4, 2018) newagebd.net

Bangladesh's total number of mobile phone subscribers reached 155.81 million at the end of September, up from 154.1 million in August, according to data from the Bangladesh Telecommunication Regulatory Commission (BTRC). Grameenphone lead with 71.41 million in September, up from 70.70 million in August, followed by Robi Axiata with 44.75 million, up from 46.13 million in the previous month. Banglalink ended September with 33.69 million customers, up from 33.46 million in August, and Teletalk had 3.94 million, an increase from 3.87 million the previous month.

(October 28, 2018) telecompaper.com

The Bangladesh Telecommunication Regulatory Commission has decided to deploy outsourcing agency to measure quality of services provided by the country's telecom operators to their subscribers. The commission made the decision last week at a commission meeting presided over by its Acting Chairman Md Jahurul Haque, a senior BTRC official told. The decision was made as the commission found that checking quality of services provided by the telecom operators including access network service providers in extensive volume would be difficult for the regulator to check with its existing manpower, the official said. To appoint outsourcing agency, the commission would float tender soon, he said. Checking quality of services is very much essential for finding the lacking in services that the mobile phone operators along with other access network service operators provide to their subscribers. BTRC statistics published in October this year showed that subscribers of the mobile phone operators lodged 1,496 complaints with BTRC in the July-September period this year regarding different problems. Issues of complaints included customers' dissatisfaction over network coverage, data package and volume offered by the mobile operators – Grameenphone, Robi, Banglalink and state-owned Teletalk. The telecom regulator has been checking QoS of the mobile phone operators under a directive that was issued on August 24, 2017 meant for 2G and 3G service quality. As per the integrated QoS regulations, which have already been approved by the telecom regulator and would be affective soon after publishing it as gazette notification, would also be applicable for all ANS providers. The regulations will replace the existing directive issued by the commission in

this connection. BTRC's area of work would be vast once the integrated QoS regulations come into effect and it would not be possible for the telecom regulator to perform such a huge task with its existing manpower, another BTRC official said. 'That's why there is no alternative for the commission but to appoint outsourcing firm,' he said. Due to the manpower shortage, the commission has so far managed to measure service quality of the mobile phone operators only in the divisional headquarters and on the highways to the divisional cities from capital Dhaka. Apart from appointing outsourcing firm, BTRC also decided to take technical support from the vendor who supplied QoS measurement tools to the telecom regulator. The immediate past BTRC chairman, Shahjahan Mahmood, in early 2017 had said that the commission would introduce ranking of the mobile phone operators based on their performance. Under the BTRC directive of 2017, the operators were asked to ensure a minimum 512-kilobyte per second downlink speed of internet in 3G-covered areas. The operators were supposed to ensure a minimum 50kbps upload speed immediately after the issuance of the directive and to increase it to 70kbps after one year. The directive also asked the operators to ensure 95 per cent or more success rate in terms of establishing connection with the operators' high-speed downlink packet access or HSDPA from users' devices. On the other hand, the mobile phone operators will have to maintain a minimum 7 megabyte per second (Mbps) internet speed for the fourth generation (4G) data service under the integrated QoS regulations.

(October 28, 2018) newagebd.net



Egypt

The head of Public Policies for the Middle East and North Africa (MENA) region at Facebook, says there are about 24 million people using the social network daily in Egypt, and the number of users who access it through mobile phones is nearly 37 million

people monthly. She told Daily News Egypt that her company has recently hosted the 'Boost Your Business' event for the very first time in Egypt this year, as part of its vision for the growth of start-ups. (November 8, 2018) telecompaper.com



Kuwait

Kuwait's Communication and Information Technology Regulatory Authority participated in the ITU Delegates' Conference in Dubai. In a statement to Kuwait News Agency (KUNA), the Communication and Information Technology Regulatory Authority (CITRA), Eng. Salim AIOthaina said, that Kuwait's participation in the ITU Delegates' Conference of 2018 is one of the important steps in the adoption of public policies and strategies in the telecommunications and information sector around the world. Eng. Salim AIOthaina pointed out that the conference is an important opportunity for the telecommunications sector at a global level, where the adoption of public policies and strategies in the telecommunications sector and information

around the world. Adding that Kuwait's participation in this important conference comes within the framework of enhancing cooperation between Kuwait and Member States in the service of the telecommunications and information technology sector. AIOthaina expressed his pleasure at electing the Director of the Technical Office of CITRA, Eng. Samira Mo'men, to chair the Second Committee of the Conference (the Credentials Committee), while also participating with the Kuwaiti Ministry of Foreign Affairs in this conference. The conference witnessed the election of the Secretary-General of the Union and Deputy Secretary-General in addition to the elections of the members of the Council of the Union, which is conducted by the State of

Kuwait as well as the election of Director of Radio Communication. The Director of Telecommunication Standardization, the Director of Communications Development of the Members of the Council as well as the Members of the Radio Regulations Board, were elected. The results of all the positions that were nominated for Kuwait tomorrow will be announced throughout the conference. The Kuwaiti delegation held a dinner in honor of delegates

attending the ITU Delegates' Conference hosted by the Emirate of Dubai. The ITU Delegates' Conference is considered to be the most important conference in the world of communications and information technology, drawing the outlines of this sector around the world as well as defining the strategy to be followed by all the entities associated with it.

(November 4, 2018) citra.gov.kw



The Lebanese Ministry of telecommunication along with the local Mobile network operators were increasingly confronted with the emerging of stolen, cloned and fraudulent terminals on mobile networks. This matter represents a real danger to the public, homeland security, government income and operators' networks. Therefore, the new measures of inMObiles MIRS (Mobile Identity Registration System) platform set under the Ministry of Telecommunications regulations, aim at regulating this sector through a new reliable system and making sure that the import of mobile phones into Lebanese territories is in conformity with the law and that imported devices are not counterfeit. inMObiles' MIRS has been fully developed in house by a team of more than one hundred highly skilled engineers and helped benefiting the Lebanese Government by: (1) ensuring the compliance of mobile devices existing on the telecommunication market with international standards, through the certification of all devices according to the IMEI; (2) preventing all counterfeit or stolen devices, or those that do not conform to international standards, from functioning on the network and accessing it; (3) receiving declarations; (4) defining technical standards of telecommunications equipment and terminals; (5) proceeding with approvals required for manufacturing, importing and marketing every device connected on the network and accessible

to the public; (6) rationalizing and increase tax revenues; and (7) increasing revenues generated by the treasury due to the collection of customs duties. Consequently, inMObiles, in partnership with the Lebanese Ministry of Telecommunications and the local mobile network operators "Touch" and "Alfa", established practical procedures that the subscriber can adopt to make sure that his/her device is compliant. Subscribers can contact the respective MNO Customer Service for further information or send an empty SMS free of charge to the service dedicated Short code and they will receive an instant message explaining the status and model of their device and the steps to follow in case it wasn't compliant. The subscriber can also send an SMS with the IMEI number of their device to the same Short code and they will receive an instant message stating the devices' model. Although and in order to facilitate the examination process, inMObiles' MIRS has also dedicated a specific section within the Ministry website so that the subscribers can enter the IMEI number and get the information they need on their device's status, model and compliancy. As a result, and comparing the difference between TAX income of August 2017 and August 2018, InMObiles' MIRS platform exceeded the mentioned revenue of 20 times, and this number is subject to increase onwards.

(October 23, 2018) Inmobiles Press Release



Morocco may consider selling stakes next year in Maroc Telecom, the country's largest telecom operator, as it aims at raising 5 billion dirhams (\$527 million) from the sale of public enterprises, the economy and finance minister said recently. Maroc Telecom, listed on both the Casablanca Stock Exchange and EuronextParis, is 53 percent controlled by the UAE's Etisalat, with the Moroccan state owning 30 percent. The government will further open the capital of public enterprises to private investors and will restructure state-owned enterprises and institutions, Economy and Finance Minister Mohamed Benchaaboun told a news conference. Public institutions such as railway operator (ONCF) require restructuring before privatisation can be considered, he said. Selling stakes in public enterprises is also aimed at boosting liquidity on the Casablanca stock exchange, he said. Privatization as well as

restructuring state-owned enterprises will help the government generate up to 8 billion dirhams to narrow the budget deficit to 3.3 percent next year, Benchaaboun said. Without privatization the budget deficit would surge to 3.7 percent of GDP in 2019, he said. The budget deficit is seen expanding to 3.8 percent this year from an initial goal of 3 percent in the 2018 budget. A surge in spending on social services, including education, health and youth employment would result in additional financial needs of 27 billion dirhams. The draft budget, which was submitted to parliament on Friday, aims to raise 2 billion dirhams in 2019 and 2020 from a 2.5 percent solidarity tax on the net profit of firms with annual net profit above 40 million dirhams. The draft budget expects the economy to grow by 3.2 percent next year, down from 3.6 percent this year, while inflation is seen below 2 percent.

(October 24, 2018) zawya.com

Lebanon

Morocco



Nepal

NTA, the regulator in telecommunication sector of Nepal has published drive test report for the first time. The drive test (DT) includes the testing of three mobile operators namely: Ntc, Ncell, and Smart. Here is the full report and statistics of the Drive test report for mobile network quality (voice and internet data) in Nepal. NTA performed drive test in the peak busy hours (in morning and evening) for the period of Ashoj 11 to 25. Drive test is a means of collecting mobile network information data using a computer software and mobile handset. As the tester with the computer software moves on a vehicle, data collection happens along the route. Drive test collects data such as mobile network coverage, capacity, and quality at that instant of time, for the whole route. The telcos use Drive test to maintain their network before they make the commercial launch of their network. They also perform the test on a regular basis and for complaints from their customers. Although the mobile operators use drive test to identify their problems and solve, regulators also perform the drive test to compare the network quality of different operators. Some independent bodies may also assess the mobile network quality for benchmarking purpose. NTA has already put the Quality guidelines into effect from last year. They also have the provision to penalize the telcos if they could not solve the identified problems in some period. Drive test only tells us the mobile network quality of the telcos at that very point. The quality of the network may be different in the locations other than those where the test was performed. NTA had performed the drive test on the major routes of Kathmandu inside ring road section. The collected data from Drive test are analyzed to give a report which is called Drive test report. Based on the NTA DT report, we already published a news for Ntc to have the best mobile network quality. The mobile call service test based on 4 benchmarks (as described earlier) showed NTC to be superior among three telcos. Whereas for data service, the Smart Telecom network is found to be superior. The ping round trip time, HTTP browsing display delay, browsing display success rate shows a better result in Ncell. Whereas other parameters are better in Smart Telecom network. Among the parameters, FTP download/upload success rate and the upload/download speed are the best with Smart SIM card. As per NTA test result, Smart's previous claim of fastest internet in Nepal holds true. Their upload and download speeds are far superior to Ncell and Ntc. This is the first time, NTA has published such KPI statistics of drive test, comparing mobile network of the top three telcos. This is a good start and we can expect them to publish such a report every quarter. First, it will help people to have a feeling of the mobile network quality of the telcos. Secondly, it will also pressurize the telcos to maintain their mobile network

quality, for the fear of penalty or their brand image.

(November 14, 2018) nepalitelecom.com

The government has appealed for investment from the domestic telecommunication firms to form a telecommunication infrastructure company. With a view to promote the sharing of telecommunication infrastructure, which would thereby ease expansion of telecommunication services across country and bring down the cost of telecommunication services, Ministry of Communications and Information Technology (MoCIT) has urged investment from the domestic telecommunication firms in setting up a telecommunication infrastructure company. The telecommunication infrastructure company will develop and expand telecommunication infrastructure across the country and share it with telecommunication firms and even with internet service providers (ISPs), according to MoCIT officials. "Domestic telecommunication firms have been investing millions of rupees independently in developing telecommunication infrastructure. As telecommunication infrastructure requires huge investment, telecommunication firms have not been able and are unwilling to expand their services across the country, especially in rural and Himalayan regions," informed Gokul Prasad Baskota, minister for communications and information technology, adding that the government is ready to set up a telecommunication infrastructure company if domestic telecommunication firms are willing to invest in the initiative. According to Minister Baskota, the trend of sharing telecommunication infrastructure among telecommunication firms and ISPs will be crucial in increasing people's access to telecommunication services and making them affordable. Along with this, the minister also informed that the government will soon issue licence to telecommunication infrastructure service providers. Nepal Telecommunications Authority (NTA) – telecommunication sector regulator – had earlier sought request for proposal from interested and eligible firms to provide telecommunication infrastructure service in the country and promote sharing of telecommunication infrastructure. Telecommunication firms from different countries including the US, India, China, Lebanon, Nigeria and Malaysia had expressed their willingness to obtain telecommunication infrastructure service license in Nepal. However, NTA has not awarded the concerned license to any firm so far. "I expect NTA to award eligible firms the concerned license within the next few weeks. Such license will be issued to more than one firm to discourage monopoly," informed Baskota.

(November 10, 2018) thehimalayantimes.com



Oman

The Telecommunications Regulatory Authority (TRA) has handed over contracts for the use of a number of government lands designated for the construction of communication towers to Oman Tower Company (OTC) to invest in the same field, as well as to maintain the general view of this type of towers/stations, so that these towers are used by all operators licensed telecommunications services in the Sultanate and government agencies and departments concerned with the provision of wireless communications. This follows the Government directive to unify the efforts in the services infrastructure in general and the telecom in particular. This comes in support of the provision of mobile telecommunications networks throughout Oman and provide comprehensive coverage through the construction of these towers, which will reduce the burden on telecommunications operators and redirect their investments in providing better services to users in Oman. OTC was established in early 2018 by Oman 70 Holding, Oman Broadband in partnership with Camusat International Group to build and manage the wireless passive infrastructure and associated services and equipment.

(November 18, 2018) timesofoman.com

Oman's Information Technology Authority (ITA) has joined forces with Microsoft in the agency's ongoing efforts to digitally transform the nation, that is in line with Oman Vision 2040, established by the royal directive of His Majesty Sultan Qaboos bin Said Al Said. The partnership, that will cement the co-operation between ITA and Microsoft, was signed during a visit of senior ITA delegates to Microsoft's Executive Briefing Center in Redmond, Washington, where the delegates witnessed the advanced technologies designed for ambitious Digital Transformation journeys. As the Oman Government's frontline force in driving Digital Transformation across the sultanate, the ITA's areas of responsibility span national infrastructure projects and the supervision of all programs related to the implementation of the Digital Oman Strategy, including providing professional leadership to other government entities engaged in the digital transformation projects. The strategic collaboration between the ITA and Microsoft will focus on how Oman can take advantage of the societal shifts occurring as the result of the Fourth Industrial Revolution, and how the sultanate can best leverage technology to stay ahead of changes and ensure that 4IR's benefits accrue to all Omanis. Under the terms of the partnership, Microsoft will work with its global partners to put Oman's ITA leaders in touch with the world's most innovative solution providers, working in 4IR arenas such as Artificial Intelligence, predictive analytics, Machine Learning, Blockchain and the Internet of Things. Through such regional and global outreach, it is envisaged that Microsoft will promote and enable knowledge transfer and capacity building that will accelerate Digital Transformation across the public and private sectors of the sultanate. "Industry 4.0 is a runaway train

that cannot be stopped," said Dr. Salim Al Ruzaiqi, CEO of ITA. "Instead, we in government must look for ways to harness the change to the benefit of all who call Oman home, in line with His Majesty's vision. That is why we have partnered with Microsoft; because its leaders tell a compelling Digital Transformation story – one where the benefits of change are shared by all." Each month, Microsoft will deliver technology-awareness sessions for government officials. Separate, quarterly 'ideation workshops' will be devoted to capacity-building, turning ideas into practical solutions, and delivering a high-level implementation roadmap. Technology proofs of concept will also play a significant role in the partnership. The ITA, will provide cloud infrastructure for hosting technology workshops and proofs of concept, and facilitate connections with business and technical stakeholders. "Microsoft is on a mission to empower every individual, organization to achieve more," said Sheikh Saif Al Hosni, Country Manager, Bahrain and Oman, Microsoft. "We have long admired the ITA's vision for digitization and its efforts to accelerate Digital Transformation in the public and private sectors of Oman enabling them to empower, engage, optimize and transform. Through this partnership, we will take the next steps together." A recent Microsoft study revealed that more than half (51%) of organizations in the Gulf region, named cloud computing a priority in terms of adoption. As the result of this and similar findings from other recognized market-research firms, and in response to overwhelming encouragement from regional customers, Microsoft announced earlier this year that it will build two dedicated cloud data centers, one in Dubai and one in Abu Dhabi that will bring its services to governments and organizations in the Middle East. Enterprises in the region can make the most out of the Microsoft Cloud by availing themselves of enterprise-grade reliability and performance, combined with data residency and the broadest compliance.

(November 10, 2018) intelligencio.com

For effective competition in the telecommunications sector, the Telecommunications Regulatory Authority (TRA) has approved Reference Access and Interconnection Offers (RAIOs) of two dominant licensees – Omantel and Ooredoo. Under the RAIOs, many new wholesale services will be available to competing licensees. Prices of many wholesale services have been rationalized based on the cost models developed by TRA as well as models submitted by Omantel and Ooredoo. Mobile call termination rate, which currently stands at 15bz per min, shall be reduced to 4bz per min in a phased manner over four years. The mobile call origination rate has been reduced from 16.6bz per min to 10.54bz per min. These RAIOs are available on respective licensees' websites. The licensees have been given two months' time to replace their existing wholesale agreements with new agreements in accordance with the approved RAIOs.

(November 4, 2018) muscatdaily.com



Pakistan

The Pakistan Telecommunication Authority (PTA) has reduced mobile termination rate (MTR), the price which a cellular operator charges another operator for receiving a call, for all types of calls – local, long distance and international incoming calls – from the existing Rs0.90 per minute to Rs0.80 per minute from the start of next year. The PTA's decision will reduce off-net call prices of all operators and MTR will be brought down to Rs0.70 per minute from Jan 1, 2020. The regulator has determined the rate after consultations with operators. The interconnect usage price was previously fixed in 2010. A PTA consultation paper "Review of Mobile Termination Rates" has termed the existing MTR rate in Pakistan 111-198 per cent higher than other comparable countries last year. It suggested a reduced rate of Rs0.80 per minute for the period between Dec 1, 2017 and Nov 30, 2018, and Rs0.70 per minute from December onwards until a cost-based study was completed. However, the suggested rates were never implemented. During the ongoing consultations, almost every telco favored the proposed reduction in MTR of up to Rs0.70 per minute during the PTA consultations. The move was opposed by the country's largest telco, Mobilink/Jazz, however, Telenor supported the change from next year onwards highlighting that the decision could hurt operators' revenues. On the other hand, Telenor also demanded a separate international termination rate of \$0.025 per minute for both fixed and mobile calls. The decrease in MTR will benefit consumers through a reduction in off-net call prices, increase competition in the market as older, bigger operators will be forced to improve their service quality to retain customer base instead of using the advantage of their existing market share to rake in higher revenues. Industry sources say the new MTR is still on the higher side. "The regulator, it appears, couldn't withstand the pressure from the larger operators as a big portion of their revenues came from MTR. (Still) something is better than nothing," an executive of a mobile operator said on condition of anonymity. (November 21, 2018) dawn.com

Upon the directions of Senate Standing Committee on information technology (IT), Pakistan Telecommunication Authority (PTA) agreed to extend the deadline for blocking unregistered mobile phones by two months. The Senate body, during a meeting, told PTA Chairman Mohammad Naveed and Director General Talib Dogar – who had appeared before the members – that public was not properly aware of the move and demanded that an

awareness campaign be launched for the masses. The Minister of IT, Khalid Maqbool Siddiqui of MQM-P was not present during the meeting. However, to decide further on the matter, the committee members directed the mobile phone companies to present a detailed briefing at the next meeting of the committee when the Federal Minister may appear in the next session. Few days earlier, the Pakistan Telecommunication Authority announced that all unregistered mobile phones across the country will be blocked after October 20. PTA had launched Device Identification, Registration and Blocking System (DIRBS) on May 10 this year, aimed to combat the use of smuggled or counterfeit sets which either serve to reduce tax revenues for the state or pose health problems to unsuspecting consumers. "We recommend that consumers buy only PTA-approved phone sets after October 20," according to PTA's Director General Services, Talib Dogar. These are the devices that are not registered with the Global System for Mobile Association (GSMA) and may be mass-produced by manufactures who do not comply with international standards of production, resulting in the proliferation of counterfeit, possibly hazardous, mobile phones. According to PTA, nearly 160 million compliant and non-complaint mobile devices, active on all the networks, had been legalized before the launch of DIRBS. All these devices would not face any service interruption as they would not be blocked by DIRBS. (October 22, 2018) arynews.tv

Pakistan Telecommunication Authority (PTA) has been trying to raise \$2.5 million from cellular companies to buy the equipment needed for cyber protection. PTA Chairman Mohammad Naveed informed the Senate Standing Committee on Interior of this development recently, which met with Rehman Malik in the chair. The Committee was briefed by Chairman PTA about the progress made so far, including measures taken to safeguard the Cyber Borders Security Control System in the greater national interest. He said that they have been trying to raise \$2.5 million from cellular companies to buy the equipment needed for cyber protection. PTA Chairman said that they have already arranged \$2.3 million. Malik appreciated PTA and said that he had advised the government both here and in the Senate House to buy equipment worth \$25 million for Pakistan Telecommunication Authority (PTA) to block blasphemous, anti-Pakistan and pornographic content. He said he is pleased to know that PTA has collected an amount of 2.3 million dollars. (October 22, 2018) propakistani.pk



Palestine

Wataniya Mobile's subscriber base increased by 57 percent year-on-year to 1.3 million at end-September, benefiting from the Gaza launch in October 2017. The total was up from 1.2 million customers reported at the end of June. The operator made good

progress in the first nine months of the year, with the launch of the 3G network in the West Bank in January, parent company Ooredoo announced. (October 29, 2018) telecompaper.com



Saudi Arabia

Huawei awarded the winners of the Saudi chapter of its ICT Competition 2018 an exclusive fully paid trip to the company's international headquarters in Shenzhen this month where they will compete with international finalists and receive knowledge training from top executives at Huawei's headquarters in Shenzhen. They will gain unrivaled exposure to Huawei's expertise in telecommunications, enterprise, and consumer business, not to mention a priceless cultural experience and knowledge exchange. The announcement was made at an event in Riyadh attended by the Deputy Minister of MCIT Dr. Ahmed Althenayan, Chinese ambassador to Saudi Arabia Li Huaxin and Huawei KSA CEO Dennis Zhang. Althenayan said: "We are delighted that 6 Saudi students reached the final in this prestigious national skills competition, it shows the quality of our technology students, this also highlights Saudi Arabia's huge segment of talented young people and we are proud to announce our solidarity to empower these young people and give them the opportunity to sharpen their skills and help them become the leaders of tomorrow in the field of information and communication technology with the help of Huawei, being the leading global technology player." Huawei KSA HR Director Faisal AlOtaibi said: "Knowledge transfer and nurturing future ICT talent has always been a core pillar of the Huawei way, and we are thrilled to run the ICT Skill Competition in Saudi Arabia in collaboration with MCIT for that exact reason. The future of ICT progress lays in the hands of our students, and by developing platforms and programs that allow them to grow and mature into experts, we can better equip the next generation of technology leaders to go ahead with achieving Saudi Arabia national transformation program and Vision 2030 targets." The trip to China will conclude the 2018 ICT Competition, which so far has gone through two rounds of rigorous examination at the local and national level. In total, 14,748 students across the Middle East applied for the competition, from which 4,915 were selected to take part in the preliminary rounds. 214 students passed on to the final round, and 39 in total from 13 teams will be traveling to China to compete internationally. (November 21, 2018) saudigazette.com.sa

Communications and Information Technology Commission (CITC) is set to collaborate with Huawei, a leading global provider of information and communications technology (ICT) infrastructure and smart devices, to launch Huawei's fourth edition of the global 'Seeds for the Future' program. This year the Seeds for the Future program is expected to attract numerous projects from a wide range of universities presented from Riyadh, each with the potential to be selected for incubation. The initiative aims to develop Information and Communication Technology (ICT) talent among Saudi students who will become tomorrow's leaders. They will also receive focused mentoring from top Huawei executives and a chance to travel to Huawei's global headquarters in Shenzhen, China, to gain exposure to one of the world's leading ICT solutions providers. The company held a special ceremony for students participating in the program at the headquarters of the Communications and Information Technology Commission in the

Saudi capital Riyadh before leaving to the headquarters of Huawei in Shenzhen, China, in the presence of the Deputy Governor of the Telecommunications Regulatory Support Sector Ahmed Al Jarboo on behalf of the Governor of the Communications and Information Technology Commission, Zhou Xinglong, Counselor of the Embassy of the People's Republic of China to Saudi Arabia, and CEO of Huawei Tech Investment Saudi Arabia Ltd., Dennis Zhang. CITC has been collaborating with Huawei since 2015 on Seeds for the Future. With a shared vision on empowering Saudi Arabia's youth, a total of 51 students have directly benefited as a result of the program, including through their visit to Huawei HQ in Shenzhen. Commenting on the launch of the fourth phase of the program, Ahmed Al Jarboo, Vice President of Corporate Communications, thanked Huawei for its efforts in serving the community and how its keen on upgrading the ICT sector in the Kingdom. He also urged students to benefit from the experience in expanding their knowledge and linking concepts Theory in practice Zenglong, Counselor of the Embassy of the People's Republic of China to Saudi Arabia said: "This is another example of the close relationship we have with Saudi Arabia. I am proud of Huawei's commitment to Social responsibility and the important role played by this prestigious company in the development of Saudi youth, The launch of the future seeds program in its fourth edition in this region and in other countries provides the cornerstone of building a digital world by developing the skills of promising young generation and help them lead the development process in their country." Dennis Zhang, CEO of Huawei Tech Investment Saudi Arabia, said: "We are pleased to announce that we will continue to partner with the Information and Communication Technology Commission of Seed for the Future in 2018. Saudi Arabia has a huge segment of young people and we are proud to announce our solidarity to empower these young people and give them the opportunity to sharpen their skills and help them become the leaders of tomorrow in the field of information and communication technology." He added: "Huawei is seeking to collaborate with government partners to develop an ecosystem for the ICT sector, and the key to this is to guide and support outstanding young talents in the field of ICT not only in Saudi Arabia, but to provide them with access to institutions to develop technologies that will help the Kingdom achieve its goals in its 2030 National Vision." Originally launched in 2008, the Seeds for the Future Program is Huawei's flagship CSR program that aims to develop local ICT talent, enhance knowledge transfer, promote a greater understanding of and interest in the telecommunications sector, and improve and encourage regional building and participation in the digital community. By the end of 2017, the 'Seeds for the Future Program' has had participants from 108 countries, and benefited over 30,000 students from more than 350 universities worldwide. Through this program, a total of 3,600 top college students have been able to visit and study at Huawei's headquarters in Shenzhen, China. (November 12, 2018) saudigazette.com.sa

The Ministry of Communications and Information Technology (MCIT) plans to launch 5G services commercially in the beginning of 2019, Minister Abdullah Al-Swaha told CNBC Arabia in an interview. The Kingdom was a pioneer in launching 5G trial-runs in the MENA region, he said on the sidelines of Dubai's Telecommunications Regulatory Authority conference. MCIT is also working with the International Telecommunication Union on

a new artificial intelligence (AI) governance initiative, he added. According to data compiled by Argaam, the Communications and Information Technology Commission (CITC) issued in May temporary licenses for 3.4-3.8 GHz bands to mobile telecom operators to start fifth generation (5G) trial operations. In August, the telecom regulator expected 5G commercial operations to start by mid-2019. (October 31, 2018) argaam.com



The government of Sudan will be launching mobile payments in the country at the start of next year, Ecofin reported. Prime Minister Moutaz Moussa explained that talks were ongoing to finalize the project. Moussa said e-payments will allow the government to better fight and any mismanagement of public

funds. The digitization and automation of services offered by the state, such as taxes, means these will be improved and more efficient. The launch of an electronic payment system by Sudan will be carried out under the government e-project, launched a few years ago. (November 23, 2018) telecompaper.com



Turkish telecommunications authority BTK organized the country's first 5G open field test at the '5G BTK Market Surveillance Laboratory' located in the campus of Ankara's Hacettepe University. The test was attended by industry representatives, including local operators Turk Telekom, Turkcell

and Vodafone Turkey. The lab's test infrastructure will open new R&D opportunities for all stakeholders of the electronic communication sector, BTK said. Tests can be conducted on the lab's infrastructure by academics, researchers, doctoral students and new technology start-ups. (November 12, 2018) telecompaper.com



The Telecommunications and Regulatory Authority (TRA) and industrial investment company SENAAT General Holding have signed pact to identify areas of cooperation in information and cybersecurity. The pact aims to facilitate knowledge exchange, in order to provide organizations across different sectors in the UAE, with warnings about cyber-attacks, viruses and hacking, and offering them with assistance in handling cyber security issues. "The TRA has rich experience in the field of information security and is well-equipped to combat piracy and cyber-attacks. We have gained this know-how after years of hard work and have spared no effort to train the human capital and offer them, especially Emiratis, a platform to grow and perform," said Eng. Mohammed Gheyath, executive director, Information Security Regulatory Affairs, TRA. "This MoU with SENAAT is a testament of our commitment to support federal and government entities and private sector, to implement best practices in cyber security." "The UAE is witnessing a digital revolution. Over the last decade, there has been a tremendous increase in cross-border data connecting the UAE with the rest of the world. Naturally, cybersecurity has become a cause of importance for the public and private sectors

alike," said Mahmood Al Hameli, senior vice president – business support, SENAAT General Holding. He added that the agreement is aligned with the strategic direction of SENAAT on maintaining the integrity and confidentiality of data and continue to create an environment conducive to innovation through the best practices that improve efficiency and quality in all areas of work. TRA will be represented by the Computer Emergency Response Team (aeCERT). As per the agreement, the (aeCERT) team will respond by providing consultation and guidance about cyber threats and assist the affiliates in reaching better results and protecting their systems from cyber-attacks. The team will be the point of contact for the authorities and will maintain database with details of international and local aeCERT teams. The team will also search and analyze risks and assess the organizations as well as search and analyze risks and assess the organizations to provide them with the latest digital technologies in addition to offering them services to lessen related risks. This service is purposely designed to provide consultation and information for quality assurance. (November 20, 2018) ibsintelligence.com

Sudan

Turkey

United Arab Emirates

The Telecommunications and Regulatory Authority (TRA) of the UAE participated in the One Million Arab Coders initiative open day, organized by the Dubai Future Foundation, held in the Emirates Towers in Dubai. The participation aimed at providing job opportunities to promising talent in the field of telecommunications and information technology. The TRA sought specialists in programming and computer science, information management, information technology and data science, in line with Dubai's vision to recognize innovative students and offer them career opportunities, as per the directives of Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of UAE and Ruler of Dubai, whose guidance and insights aim to make the UAE a preferred destination for career growth for talent from the Arabic countries and from all over the world. As part of its participation, the TRA provided jobs and training for the students from various educational institutions, with specialization in scientific and technical fields. It aimed to invest in students by developing their abilities and enabling them to contribute towards up lifteners of global standards and practices in applied telecommunications and information technology. Hamad Obaid Al Mansoori, Director General of the TRA, said, "We have learnt from our wise leadership the importance of investing in people, hence we, at the TRA, make sure that we actively participate in all the events and initiatives that uphold this vision." "It's worth mentioning that the initiative plays an important role in grooming the Arab youth to become future proof and excel in the subjects of science and technology. Our participation is linked to our mission of serving the country by providing employment and training opportunities for young professionals in the areas of telecommunications and information technology," Al Mansoori added stressed that the initiative launched by H.H Sheikh Mohammed Bin Rashid Al Maktoum is a historic landmark in the programming and computer science sector in the Arab world, as it provides an unparalleled opportunity to all creative and innovative minds, so that they can keep up with the latest developments in the world of technology. The initiative intends to enable millions of young Arabs and increase their chances of getting jobs in the sector. This is being done by providing them with a platform to sharpen their skills and enrich their knowledge in advanced sciences and programming language. (November 10, 2018) trade-arabia.com

The Telecommunications Regulatory Authority (TRA) said that it has no issues with the voice over internet protocol (VoIP) services in the country. Majed Sultan Al Mesmar, Deputy Director-General of TRA, told Gulf News that as VoIP is a regulated service, interested players need to get a UAE license or authorization and follow the framework. He said that VoIP apps that comply with UAE's regulatory framework work perfectly fine in the UAE. VoIP entails free or low-cost voice or video calls on apps such as Google's Duo, Microsoft's Skype, Apple's FaceTime and WhatsApp as done over the internet. When asked whether TRA is in talks with VoIP players, Al Mesmar said: "We always clarify the requirements and TRA's website contains all the required information with regard to VoIP policy and [the] licensing framework and how to apply." In addition, he said that VoIP providers can also coordinate with licensed operators if they wish to obtain the required authorizations. "We have authorized the apps of Botim and C'Me

as they approached us through the licensed operators. Apart from these, no other players have approached us," he said. Both Etisalat and du offer a monthly fee of Dh50 for mobile users for Botim and C'Me and Dh100 per month for WiFi users at home. Microsoft told Gulf News in April that they are in talks with the TRA to lift the ban on Skype. Sukhdev Singh, executive director of market research and advisory firm Kantar TNS, said that big businesses have their own VPNs to access Skype video and voice calls in the UAE. With Microsoft opening two data centers in Dubai and Abu Dhabi early next year, Singh said Skype could become a reality. Skype is part of Microsoft Office 365. Right now, only the chat feature, which is text-based, in Skype is available for businesses. "OTT [over the top] services such as VoIP calls have internationally become a norm. VoIP is one of the main fallouts of the reliable high-speed networks," he said. Al Mesmar said that the VoIP policy was announced in 2006 and it was updated in 2009. "The TRA always conducts studies related to different policies and regulations to be aligned with the vision of the UAE, and an update will be implemented if the outcome of the studies recommends it," he said. (November 8, 2018) gulfnews.com

The subscription base in UAE mobile phone services expanded to 18.4 million subscribers, according to figures released by Etisalat and du. Mobile services account for 85 percent of two operators' revenues if compared to other income streams, which include data, internet, and fixed-line services, with pre-paid service subscribers representing over 88 percent of total subscribers in all phone services, while the rest goes for post-paid services. According to Etisalat Group, the number of subscribers in the company's mobile services amounted to 10.7 million during the first nine months of the year, making up 58 percent of total subscriptions base in the country. In the meantime, Emirates Integrated Telecommunications Company's subscribers stood at AED7.7 million, according to the du's Q3 financial statements. The two operators' revenues picked up to AED49.36 bn during the first nine months of the year against AED47.7 bn during the corresponding period in 2017. They posted total profit of AED8 billion, up 4.1 percent on-year from AED7.68 bn in 2017.

(November 4, 2018) wam.ae

The Telecommunications Regulatory Authority (TRA) visited various countries across the world in preparations to organize the International Telecommunications Union's (ITU) key event Plenipotentiary Conference 2018 (PP-18), which is being hosted in the United Arab Emirates (UAE) from October 29 to November 16, 2018. The visits aimed at raising awareness about the importance and the activities of the quadrennial event to be held in the UAE for the first time. The TRA is bracing up for the global event by working on the logistics and forming specialized task forces in order to make the Conference a success. The visits covered countries in various groups (as per PP-18) including Asia, Australia, Africa, Russia, Europe and the Arab region, wherein several meetings were conducted with the Eng. Majed Sultan Al Mesmar, Deputy Director General for Telecommunications Sector at the TRA, who is also the candidate for the Chairmanship of the PP-18. These meetings discussed significant topics with an aim of coming up with consensual views about the sector and related

issues. During these visits, Chairman of the Arab group (for PP-18) and Executive Director for the Spectrum Management at the TRA, Eng. Tariq Al Awadhi, reviewed the latest developments in the field of information and communication technologies (ICT) in the Arab world and highlighted their contributions along with the role played by the rest of the groups for the Conference. Commenting on the preparations, Hamad Obaid Al Mansoori, the Director General of the TRA, said, "Since the UAE has been chosen to host the 20th edition of PP-18, the TRA has been making considerable efforts to make this event a success. We are keen to highlight the leading position that the UAE holds in the sector of ICT. Today, the teams at the TRA continue to work towards achieving the highest degree of local and international engagement for the Conference and we are completely prepared to host it." He stressed that hosting the Conference reflects the important place that the UAE has secured in the world ICT map as the country has proven its ability to excel in all sectors across all industries. He said that the UAE has emerged as a preferred destination for the important events and initiatives that seek to advance the lifestyle of people and make the world a happier and more sustainable place to live. He added, "The country's development in the telecommunications sector is a result of the directives of the wise leadership that has always encouraged investment in the field. As per the vision of our leaders, we aim to place UAE at the forefront of the ICT sector." Eng. Majed Al Mesmar, Deputy Director General for Telecommunications Sector at the TRA, said: "The UAE is one of the leading countries in the telecommunications sector, offering the best services and this conference is an ideal opportunity for us to share our experience with the world. Over the next three weeks, the Dubai World Trade Centre will be a venue for a number of important meetings, discussions and workshops pertaining to the field of telecommunications. We anticipate that the Conference will have a positive impact on the sector, at both local and global levels." Al Mesmar pointed out that hosting the conference highlights the role of the UAE in the ICT. He added, "Vice President and Prime Minister of the UAE and the Ruler of Dubai, His Highness Sheikh Mohammed bin Rashid Al Maktoum, has set out goals for us to rank first in the world in all fields. We are working towards the vision of the leaders and it was evident when the UAE was ranked among top 50 in the Global Competitiveness Index 2017-2018. The UAE has emerged as a leader in the telecommunications sector, It is one of the best countries in terms of ICT infrastructure and also one of the first countries to adopt the fifth generation (5G) technology and set an example for other countries." PP-18, considers the reports and proposals relating to the policy issues of the ITU, which is a specialized United Nations information and communication technology Agency, allocates global radio spectrum and satellite orbits, develop the technical standards that ensure networks and technologies seamlessly interconnect, and strive to improve access to the field to the under-served communities worldwide. Due to its global membership, ITU brings the benefits of modern communication technologies to people everywhere in an efficient, safe and easy way, with high quality and in addition to the 193 member States, ITU membership includes the information and communication technology organization, many Leading academic institutes, and about 700 technical companies around the world. (October 27, 2018) [zawya.com](#)

UAE's Ministry of Finance (MoF) held an interactive session on its artificial intelligence initiatives alongside its participation in Gitex Technology Week 2018 which concluded in Dubai, UAE. Shamma Youssef, chairperson of the Emirates Youth Council at MoF, led the session with the participation of Ahmed Bin Fahad, who is responsible for the follow-ups and supervision of digital transformation projects in the Ministry and is also a member of the Youth Council. The session hosted representatives of the Emirates Youth Council, Youth Council members in other government entities, strategic partners of the Ministry as well as GITEX visitors. Mariam Al Amiri, Assistant Undersecretary for the Management of Financial Resources, stressed the ministry's commitment to innovate in its various operations in order to increase the use of modern technologies in government financial services. Al Amiri said: "The ministry is keen to reflect our wise leadership's directives by adopting an innovative approach across all its operations, turning it into a center of excellence and an international reference for innovative best practices in government financial work." During the session, a discussion on the government's efforts to improve Artificial Intelligence was held, where a Minister of State for Artificial Intelligence was appointed and the Emirates Artificial Intelligence Strategy was launched. That, in addition to incorporating the benefits of this technology to services and data analysis that would accelerate the completion of tasks, create an innovative work environment, and increase productivity, all of which fall in line with achieving the UAE Centennial 2071 objectives. The interactive session also included a discussion of the challenges facing the ministry in the data management and analysis process and the proposed solutions to overcome including the Ministry's own efforts to implement a unified database in order to provide accurate data to support the decision-making process. The session then dealt with a list of the most important jobs that will come in light of such technological advancements including those relating to artificial intelligence. MoF's participation in Gitex Technology Week is aimed at introducing the public to the latest and best technical services of the Ministry, reviewing the Ministry of Finance's innovative technical initiatives, identifying customer requirements and observations directly and building new partnerships in the technical field.

(October 20, 2018) [tradedarabia.com](#)

The Ministry of Defence, MoD, has signed a contract with Injazat Data Systems, an industry-recognized market leader in the region for information technology, data center and managed services, to support the ministry's e-system. Major General Pilot Abdullah Al Hashemy, Assistant Under-Secretary for Support Services at the ministry, and Khaled Al Melhi, Chief Executive Officer of Injazat, witnessed the signing ceremony, along with a number of officials from both sides. Major General Pilot Al Hashemy said the ministry was seeking to implement the most advanced electronic and digital transformation systems. "The contract is aligned with the federal government digital transformation strategy," he stated. Injazat is fully owned by Mubadala, the investment arm of the Government of Abu Dhabi. 

(October 20, 2018) [zawya.com](#)

REGULATORY ACTIVITIES BEYOND THE SAMENA REGION



Albania

The telecoms watchdog the Electronic and Postal Communications Authority (Autoritetit Te Komunikimeve Elektronike Dhe Postare, AKEP) has agreed to rescind a series of decisions concerning its analysis document for the wholesale access and origination, international wholesale call termination and retail mobile markets, following a series of complaints from Vodafone Albania, ALBtelecom and Neofone. Explaining its decision, AKEP said that it had taken into consideration the importance of telecommunications as one of the country's strategic sectors and as such was taking 'maximum care to ensure a climate of understanding and support for

investment'. AKEP went on to say that it had evaluated assistance provided by the EC, which expressed its full support and readiness to contribute with expertise in the multidimensional process of market analyses, and had deemed it necessary to repeal the previous decisions on the subject. The repeal affects decisions 78, 79, 80, 81 and 82, all dated 1 October 2018, which: approve the market analysis document (78); establish as operators with significant market power (SMP) Vodafone Albania, Albtelecom and Telekom Albania (79, 80 and 81 respectively); and set out regulator measures for SMP players (82).

(November 20, 2018) telegeography.com



Australia

Recent developments in Australia's wholesale market for internet interconnection services will boost competition in the supply of internet connectivity and hosted services to corporate and government customers, and lead to a better online experience for end-users, the Australian Competition and Consumer Commission (ACCC) has suggested. In a press release regarding the matter, the ACCC highlighted the fact that Optus, Telstra, and TPG have all now published the criteria on which they will consider peering with other ISPs, detailing the requirements other providers need to achieve in order to directly interconnect with them on a settlement free basis. Notably, Telstra has already entered into a peering relationship with Vocus, it was noted. Meanwhile, the ACCC has also issued an update on its assessment of whether access to internet

interconnection services is available on competitive terms. In this, the regulator said it had not identified any clear evidence of anticompetitive conduct by Optus, Telstra or TPG in the supply of internet interconnection services. It did note, however, that the information it has collated 'suggests that there was a strong incentive for Optus, Telstra and TPG to maintain the status quo in relation to their long-standing peering arrangements, resulting in an unwillingness to peer with other internet service providers'. Despite this – citing recent developments in the peering arrangements and, in particular, Telstra and Vocus entering into a peering relationship – at this time, the ACCC does not consider there to be a case for commencing a declaration inquiry into internet interconnection services under Part XIC of the Competition and Consumer Act.

(October 23, 2018) telegeography.com



Belgium

The Belgian Institute for Post and Telecommunications (BIPT) has given details of a step-by-step plan for the upcoming 700MHz auction. Bidding will start at a reserve price of EUR20 million (USD22.7 million) per block of 5MHz for 20-year permits. Some channels in the 700MHz frequency band are being used for terrestrial TV broadcasting but in time these will be

released. Bilateral treaties have already been signed between Belgium and neighboring countries to decide how the broadcasting spectrum will be divided in the 470MHz-694MHz frequency range. Further details on the BIPT's plans for the 700MHz band can be found on the regulator's website.

(November 1, 2018) telegeography.com



Burkina Faso

The government has decided that in light of rapid technological advances and new use cases, it will strengthen the legal framework and regulation of the telecommunications sector. The Council of Ministers met to draft a decree amending the law of November 27, 2008 on the general regulation of networks and services of electronic communication. The proposed

decree will go before the National Assembly before it can be passed into law; the aims of the amendment are to improve access to telecoms services for the population and also to protect the sector from practices that could harm its security and economy.

(October 29, 2018) Agence Ecofin



Canada

The Canadian Radio-television and Telecommunications Commission launched a proceeding to establish a mandatory code of conduct for internet service providers in order to address problems of contract clarity, bill shock and barriers to switching service providers. There are already codes for wireless and television services, introduced in 2013 and 2017, respectively. The wireless code, which effectively axed three-year contracts and capped much-loathed roaming and data overage fees, was costly for providers to implement. With internet access increasingly critical to Canadians, it's no shock the CRTC is moving toward a code. Yet the timing of a call surprised the industry. The CRTC just wrapped up a government-mandated public inquiry into whether telecom providers use aggressive or misleading sales practices. At the October hearing, an internet code was discussed as a potential solution to some of the problems. Many internet-related complaints stemmed from the point of sale, where numerous customers reported a mismatch between what they thought they agreed to buy and the actual price or service they received. Despite the overlap between the two files, the CRTC said the two proceedings are distinct. It called for public comments on whether an internet code is needed, what should be in it and how it will be implemented, administered and enforced. "While Internet services play an important role in the everyday lives of Canadians, the number of complaints has been trending up and we are of the view that a code for these services may be needed," CRTC chairman Ian Scott said in a statement. The Commission

for Complaints for Telecom-Television Services (CCTS), the watchdog that consumers turn to as a last resort if they can't resolve problems with their provider, reported a 38 per cent increase in complaints about internet services in its 2016-17 annual report. The CRTC's suggestions for the code included requiring door-to-door salespeople to clarify time-limited discounts, demanding service providers notify customers when they've used their monthly data allotment, and insisting upon trial periods of up to 30 days where a customer can cancel free of charge. The CRTC recommended the new rules only apply to incumbent cable and telephone providers such as Rogers Communications Inc., Shaw Communications Inc., Videotron Inc., Telus Corp, BCE Inc. and SaskTel. These players serve 87 per cent of the market. Smaller providers such as TekSavvy (there are 550 such resellers across Canada) would not be subject to the code. Spokespeople from Rogers and Telus said they will actively participate in the consultation process. "Our customer-first approach includes our commitment to being clear, simple and fair every time we connect with our customers, and our in-market residential plans are month-to-month with no early cancellation fee," Rogers spokeswoman Sarah Schmidt said in an email. Telus also touted its consumer-friendly ways. "We've had the fewest complaints of any national carrier for the last six years," spokeswoman Erin Dermer said in an email, adding that Telus has the highest customer loyalty rates. Bell is still reviewing the notice, spokesman Marc Choma said.

(November 11, 2018) vancouversun.com



France

The telecom regulator Arcep has kicked off a public consultation period on the 5G auction process for the 3.4-3.8 GHz, 26 GHz, and 1.4 GHz frequencies, the regulator said in a statement. The watchdog called on various players to take part in the consultation, including carriers, local authorities, and companies in the energy, health, media, industry, agriculture, and automobile sectors. Arcep said that the deadline to submit comments is December 19. The regulator also confirmed that it aims to launch the tender to award 5G frequencies by mid-2019. In July, the French government said it expects at least one major city to have commercial 5G services by 2020 as one of the key initiatives of the country's 5G roadmap. This follows through on the agreement reached between the government, Arcep and mobile operators on January 14, aimed at rapidly achieving a high standard of coverage across the whole of France, by stepping up the pace of 4G rollouts. The roadmap sets a number of targets, including the launch of several 5G pilot projects in a variety of regions, and hosting some of the world's pioneer industrial 5G applications; allocating new 5G frequencies and providing 5G coverage of the main transport routes by 2025. In January this year, Arcep

announced that it was planning to issue temporary frequency authorizations to develop 5G pilot projects in France. The regulator said it will offer spectrum in the 3.5 GHz band (3400 – 3800 MHz) in the metropolitan areas of Lyon, Bordeaux, Nantes, Lille, Le Havre, Saint-Étienne, Douai, Montpellier and Grenoble. These initial 5G trials will allow Arcep to obtain initial feedback on the use of 5G networks. With the information obtained from future 5G trials, the regulator said it will pave the way for the allocation procedure for future 5G licenses. Local carriers are currently carrying out a number of 5G trials to pave the way for the future launch of this technology. Altice France (SFR Group) achieved downlink speeds of 2.3 Gbps in a live demonstration of 5G technology at the operator's new headquarters in Paris. The 5G trial network enabled SFR to stream 4K content and broadcast eight live feeds from different cameras. SFR said the demo used radio infrastructure and equipment from Chinese vendor Huawei, along with core network components provided by Cisco. Earlier this year, Orange announced plans to extend 5G tests to greater Paris area and Île-de-France. The telco named Paris, Châtillon and Linas-Montlhéry as the next zones to host Orange's 5G tests. In Paris, Orange

expects to introduce a platform designed for 5G demonstrations in the Opéra district where its Orange Opéra megastore is located. This 5G test will take place next year, the telco said. Orange has also made plans to partners the chance to test innovative products and services in a 5G laboratory at its Orange Gardens site in Châtillon. These tests will focus in particular on 5G services for the general public, such as virtual reality and augmented reality, communications in an immersive environment and 4K/8K video.

(October 29, 2018) rcrwireless.com

The telecom regulator Arcep has allocated airwaves to key players in the market. In the 2.1 GHz band, the regulator allocated 14.8 MHz duplex spectrum each to Bouygues, Free Mobile, Orange and SFR from August 2021. In the 900 MHz band, the four will each hold 8.7 MHz duplex spectrum from December 2024, though positioning in the band is not yet set. In the 1,800 MHz band, Free Mobile wasn't a candidate; Bouygues, Orange and SFR will each receive 20 MHz duplex.

(October 27, 2018) seekingalpha.com

French telecom operators are set to pay a hefty price to buy 5G radio frequencies in 2019, but authorities are seeking to avoid bleeding them dry, the head of the country's telecoms regulator told Reuters. Italy, one of the first European countries to offer frequencies for 5G services, stunned markets by raising a bumper 6.5 billion euros (\$7.39 billion) for state coffers in its fifth-generation mobile auction, sending shivers down telecom investors' spines. "In the past, the financial argument may have been important, perhaps very important, but opinions have changed," said Sebastien Soriano, the head of France's telecoms

authority Arcep. "There's room to be inventive. Now, we need to find the right ideas and that's not easy," he added. Cash-strapped countries in Europe have typically used mobile spectrum auctions, which provide raw material for wireless carriers to develop networks, as an easy money-maker in times of low state revenues. But concerns are growing over risks they could hamper much-needed investments on new mobile infrastructure, which could connect everything from autonomous vehicles to public transportation and smart objects under 5G technology. For the next spectrum auction, Arcep plans to essentially use the 3.5 GHz band out of three on the table for 5G (1.4 GHz, 3.5 GHz and 26 GHz). But there might not be enough airwaves for everyone, Soriano said, and that scarcity could eventually drive up auction prices. "As long as we've not solved this problem about the quantity of frequencies that we have at our disposal ... there's a difficult equation to balance," he said. "I can't say that Italy is a counter-example as long as I haven't found the solution so that we don't do the same thing." One thing is certain: there will be no reiteration of the "new deal" under which French wireless carriers Orange, Altice Europe's SFR, Bouygues Telecom and Iliad promised to spend 3 billion euros in rolling out a 4G network to ensure there are no coverage gaps by 2020. "Sadly, we can't make a comparison with the new deal in the sense that it's a new attribution (of frequencies)," Soriano said. France still has a few months to find the answer to this equation and that work starts with a public consultation on Friday about the attribution of frequencies, which will run until December 19. The last spectrum auction in 2015 raised 2.8 billion euros for French state coffers.

(October 26, 2018) reuters.com



Germany

Germany's Federal Network Agency (FNA BNetzA) has presented its final draft for the upcoming 5G spectrum auction for approval by the Advisory Council. The revised draft outlines the terms and conditions of the spectrum sale, including additional coverage obligations. 'We revised our original draft in light of numerous comments, keeping in mind what is technically, economically and legally possible,' commented FNA President Jochen Homann, adding: 'The conditions now also include the supply of rural roads, waterways and railways, in return we have strengthened the possibilities for cooperation between the network operators and provided for a reciprocal crediting of the supply, thus keeping the economic burden on the companies in check.' The coverage obligations for the 2100MHz and 3.6GHz license winners include a requirement to supply speeds of a minimum of 100Mbps to at least 98% of households in each state by the end of 2022, as well as all federal highways, and the main roads and railways. By the end

of 2024, 5G spectrum holders will be obliged to provide speeds of 100Mbps to all other main roads, while covering the smaller roads, railways, seaports and the main waterways with data rates of at least 50Mbps. Furthermore, each operator will have to set up 1,000 5G base stations by the end of 2022, in addition to 500 base stations in so-called 'white spot' unserved rural areas. For any potential newcomers, separate coverage requirements apply. A final decision is set to be made on 26 November with the auction slated to go ahead in spring 2019. (November 19, 2018) telegeography.com

The government Ministers have met with the head of the Federal Networks Agency to discuss progress on setting the terms of the 5G spectrum auction. The Infrastructure Minister Andreas Scheuer suggested that coverage requirements may be stricter than the original proposal from the Bundesnetzagentur, news agency DPA reports. Scheuer said the government was "committed to the nationwide expansion of

mobile communications". This means not just cities should benefit from digitization but also rural areas, to ensure the same quality of life, he said. Following a meeting on 05 November, government representatives and the Federal Network Agency agreed new supply requirements for the upcoming auction, the ministry said. The telecoms regulator is finalizing the plans before presenting its plan at the end of this month. This is expected to mean better coverage along train lines, and not just high-speed lines, as well as required coverage along more roads than just the national motorways, albeit at a lower speed of 50 Mbps. The agency had previously said it was not economically viable to require such coverage with the current frequencies in the 2GHz and 3.6GHz bands, and other, more suitable spectrum would be made available later. Information obtained by Handelsblatt on the new proposal suggests operators would be required to cover three times as many railways by the end of 2022 with 100 Mbps. The remaining 15,000 km of railways, on which fewer than 2,000 passengers travel each day, would be covered gradually, as well as the core network of waterways and ports. In addition, the paper said a latency requirement of 10ms would be added

for motorways, to ensure the networks necessary for autonomous vehicles. Separately, the Association of Municipal Enterprises (VKU), fiber industry group Buglas and the Internet Economy Foundation (IEF) published a policy paper calling for the government to require national roaming on mobile networks. They argue the networks should be considered a public interest, leading to stricter requirements for providing services to all. Especially in rural areas, operators should be able to share infrastructure in order to boost coverage. This includes providing network access to local players or new entrants who can help break the "oligopoly" of the three mobile operators, the associations said. Federal Minister of Economics Peter Altmaier, who also attended the meeting with the Bundesnetzagentur, said he supported the idea of increased cooperation between operators in the expansion of networks. However, according to the Handelsblatt's information, no national roaming requirement will be added in the revised auction proposal. Instead, the regulator can impose local roaming arrangements if operators are unable to reach agreement on a cooperation to cover white zones.

(November 8, 2018) telecompaper.com



Ghana

The National Communications Authority (NCA) has fined the four dominant mobile network operators (MNOs) for breaching various quality of service (QoS) requirements. The four companies have been fined a total of GHS34.1 million (USD7.0 million) by the regulator, with AirtelTigo ordered to pay GHS11.6 million, MTN GHS9.1 million, Vodafone GHS8.9 million and Glo GHS4.5 million. The NCA regularly undertakes QoS monitoring to make sure that companies are complying with regulations and the terms set out in their licenses. In Q1 this year the NCA carried out QoS monitoring of all MNOs in the Greater Accra, Eastern, Western, Northern regions, as well as in two districts of the Ashanti region, where the four operators concerned were all found to be not meeting the QoS standards for coverage, data, voice and speech quality. The NCA gave the mobile operators three months to rectify the issues

found on their networks, however, at the end of that deadline the regulator found that all four cellcos were still not able to meet the KPI thresholds, as specified in their licenses. (November 23, 2018) telegeography.com

The National Communications Authority (NCA) of Ghana received just two bids in its October 2018 auction of 800MHz frequencies, writes GhanaWeb, citing 'reliable information' on the matter. In the auction there were reportedly three 2x5MHz slots on offer, with the NCA's asking price for each set at USD33.75 million. Vodafone Ghana is reported to have offered USD24 million for one slot, while local company Quantum Oil offered just USD2 million for another. A winner was supposed to have been announced by 24 October, but the NCA has yet to do so.

(November 2, 2018) GhanaWeb



Hong Kong

The telecoms regulator, the Office of the Communications Authority (OFCA), has confirmed that four companies are seeking spectrum in its forthcoming sale of 900MHz and 1800MHz spectrum. These are incumbent cellcos HKT, Hutchison Telephone (3), China Mobile Hong Kong (CMHK) and SmarTone. The watchdog says that its next step in the sale process will be to publish a list of qualified bidders. The 900MHz and 1800MHz spectrum auction is scheduled for next month and is designed to redistribute 200MHz of wireless spectrum which is due to be handed back to the regulator following the expiry of existing licenses.

The four incumbents will each be offered the right of first refusal (RFR) for 20MHz of frequencies, in order to ensure they can maintain their current services. The remaining 70MHz of spectrum in the 1800MHz band, together with a 50MHz block of spectrum in the 900MHz band, will be assigned via an auction process. The government has set the auction reserve price at HKD38 million (USD4.9 million) per MHz. A cap of 90MHz per operator will apply to the combined 900MHz and 1800MHz bands, with a sub-cap of 20MHz per operator in the 900MHz band.

(November 19, 2018) .telegeography.com



India

The Department of Telecommunications (DoT) has ordered cellcos to cease using Aadhaar-based identification to verify subscriber lines, in line with a Supreme Court order in September. A notice from the DoT instructed providers to stop using the government-managed ID system for 'electronic know your customer (eKYC)' services for verifying new or existing customers. The DoT said that providers should adopt an alternate digital process that would allow verification to remain paperless by using scanned images of proof of address and identity. Mobile operators have been caught in the middle of a policy U-turn from the Supreme Court which on the implementation of the voluntary identification system: in February 2017 the court mandated the re-verification of subscriber lines via Aadhaar, but postponed the deadline indefinitely following legal challenges to the mandatory use of Aadhaar verification for various services, and ultimately reversed its decision altogether in late September. Cellcos have been waiting since then for direction from regulatory authorities to ensure compliance with the new order. Providers now have until 5 November to comply with the DoT's instructions. In addition to the expense of re-orienting their subscriber identification processes, the apex court's decision is expected to negatively impact the nation's cellcos by extending subscriber sign-up times and increasing customer acquisition costs. (October 29, 2018) [The Economic Times](#)

The Indian government has freed a tranche of 5GHz spectrum from licensing requirements for the provision of Wi-Fi and 5G services. The Economic Times cites an official notification as saying that no license would be required to 'establish, maintain, work, possess, or deal in any wireless equipment for the purpose of low power wireless access systems, including radio local area networks' operating in the 5150MHz-5350MHz and 5470MHz-5875MHz bands. The move is expected to help the government's BharatNet project, under which the state is planning to roll out around ten million

Wi-Fi hotspots in rural areas, as well as bolstering the deployment of Wi-Fi networks in urban areas by private telcos. Further, reducing the restrictions on the spectrum will simplify upcoming field trials of certain 5G technologies. (October 23, 2018) [telegeography.com](#)

The department of telecommunications has asked the regulator to prepare and recommend steps to encourage proliferation of entities under the Other Service Provider (OSP) category, an official familiar with the development told Moneycontrol. "A reference has been received from DoT on OSPs. It came around ten days back," the official said. Business process outsourcing companies and those operating call centers come under the other service provider category. Tele-banking, tele-medicine, tele-trading, e-commerce are other service providers that operate by using infrastructure provided by various access providers for non-telecom services. Network operation centers and vehicle tracking systems also come under this category. OSP registration is also used by entities providing work from home opportunities. OSPs do not need a separate license to operate these services. They simply need to register themselves with the Telecom Enforcement Resource and Monitoring cell of the DoT. DoT has TERM cells in each state and OSPs just need to register themselves in the state they are present in. Under the existing framework, the responsibility of ensuring that an OSP has valid registration papers rests on the access service provider the OSP is using the services of. DoT's reference to the Telecom Regulatory Authority of India is an attempt to further the cause of the government's new telecom policy approved last month. The government's National Digital Communications Policy, 2018, aims to attract \$100 billion investment in the digital communications sector by 2022. It aims to provide broadband connectivity at 50 Mbps to every citizen by the same year. It seeks to provide fixed line broadband to 50 percent of households. (October 23, 2018) [moneycontrol.com](#)



Indonesia

The Ministry of Communications and Information Technology (MCIT) in Indonesia (KemKominfo), has reportedly revoked the radio frequency band licences (IPFR) held by Broadband Wireless Access (BWA) operators First Media, Internux (Bolt!) and Jasnita Tellekomindo for failing to pay frequency fees since 2016. KemKominfo's resources director Dwi Handoko is quoted by local press as saying that the companies had 'ignored' three warning letters issued by the MCIT before their permits were revoked under Article 21 of Communications and Information Ministerial Regulation No 9/2018 – on the provision of the operation of radio frequency spectrum. The three

operators' IPFR permits were taken away, Dwi added, after their collective failure to make any payments by 17 November, the deadline previously set by KemKominfo. First Media, Internux (Bolt!) and Jasnita Tellekomindo each won spectrum at Indonesia's auction of the 2.3GHz band in 2009, the payment deadline for which falls on 17 November each year. First Media operates in Zone 1, the northern part of Sumatra and Zone 4, Greater Jakarta and Banten, and has outstanding fees totaling IDR364.84 billion (USD24.93 million); Internux also operates in Zone 4 and owes IDR343.57 billion, while Jasnita operates in Zone 12, the northern part of Sulawesi, and has unpaid fees of IDR2.19 billion. (November 20, 2018) [telegeography.com](#)



Italy

The Italian government is preparing legislation which could pave the way for the creation of a single broadband infrastructure company. A report from Reuters says that authorities are looking to combine the networks of Telecom Italia (TIM) and Open Fiber to avoid duplication. The government is a major investor in Open Fiber via state lender Cassa Depositi e Prestiti (CDP) and national utility company Enel, while it also has a minority interest in TIM. The report quotes Italy's Deputy Prime Minister, Luigi di Maio, as saying: 'We are working to set the conditions in order to create a single player to distribute internet and broadband.' He added that the government is looking set up talks with all the parties involved and hopes to forge an agreement by the end of the year. Telecom Italia is currently working on the separation of its network assets from its retail operations and is creating a new wholly-owned unit – NetCo – to hold its infrastructure business. Executives at both Enel and TIM have in the past said they are open to an infrastructure sharing partnership between the two firms, though they have stopped short of advocating a full-blown combination of their assets.

(November 12, 2018) telegeography.com

Iliad Italia is prepared to take action against Agcom if the regulator grants an extension to companies with licenses for 5G-suitable frequencies, having paid a hefty amount to acquire spectrum in an auction last month, local publication Corriere delle Comunicazioni reported. Vodafone Italia and Telecom Italia each spent €2.4 billion while newcomer Iliad spent €1.2 billion in the auction, with spectrum in the 3.7GHz band in particularly high demand. In total, the government raised €6.5 billion and came under fire for the high prices. Agcom responded to the criticism, with its

president Angelo Marcello Cardani saying: "If someone pays a price, to me it's never excessive, unless that person has a gun pointed to their head". However, since the auction it was revealed WiMAX providers Linkem, Tiscali, Go Internet and Mandarin may be allowed to retain licenses covering spectrum in the 3.6GHz to 3.8GHz bands for an additional six years after the current term expires in 2023. Iliad, which launched its low-cost Italian venture in May 2018, reportedly said it will file a complaint with the Regional Administrative Court of Lazio if the renewals go through. Telecom Italia also holds a license in the 3.6GHz to 3.8GHz bands, but it will not be extended due to competition concerns. Corriere delle Comunicazioni previously reported some Senators had already asked Deputy Prime Minister Luigi Di Maio to investigate the license renewals, deeming them unjustified.

(November 2, 2018) mobileworldlive.com

A group of Italian senators are asking industry minister Luigi Di Maio to investigate the proposed extension of licenses in the 3.4GHz-3.6GHz band. Earlier this year fixed-wireless operators including GO internet, Tiscali, Linkem, Mandarin and TIM approached telecoms regulator AGCOM to request a six-year extension to their existing concessions, stretching their expiry date to December 2029. The recent sale of 5G-capable spectrum in the 3.6GHz-3.8GHz band raised EUR4.35 billion (USD5 billion), and the ministers are querying why the 3.4GHz-3.6GHz band licenses would be extended. They say the frequencies in question could be worth up to EUR4 billion if sold at auction. The probe has cast a doubt on whether Fastweb's proposed EUR150 million acquisition of Tiscali's fixed-wireless business will go ahead as planned. (October 22, 2018) telegeography.com



Latvia

The telecoms watchdog the Public Utilities Commission (Sabiedrisko Pakalpojumu Regulesanas Komisija [SPRK]) has agreed to extend the duration of several spectrum licenses held by ISP Unistars. The expiry date for the operator's concessions for spectrum in the following bands was pushed back from September 15, 2020 to December 31, 2028: 3450MHz-3500MHz, 3600MHz-3650MHz, 3700MHz-3750MHz, 17.7GHz-19.7GHz and 37.0GHz-39.5GHz. Unistar's license

for frequencies in the 26GHz range, meanwhile, was also extended, with the cut-off date postponed from September 15, 2020 to September 14, 2030. Unistar's 3.5GHz, 3.6GHz and 26GHz licenses were renewed for five years in September 2005 before being extended by a further ten years in September 2010. The fixed-wireless broadband provider was acquired by wireless operator Bite in April 2017. (October 31, 2018) telegeography.com



Mali

Malitel has finally secured permission to begin offering 4G services in the country. Following a meeting of Mali's Council of Ministers earlier this week, the government reportedly approved a draft decree which made an addendum to the cellco's existing concession allowing for the provision of LTE-based services. The amendment to its concession also includes coverage obligations and quality of service (QoS) requirements for 4G services. In November 2017

the government confirmed that it had finalized the technical specifications for a 4G license for Malitel, but financial negotiations were still said to be ongoing at that date. Prior to that, the authorities had issued a 4G concession to Orange Mali in July 2017, at a cost of XOF100 billion (around USD174,000); financial details of Malitel's license upgrade were not reported.

(October 26, 2018) Agence Ecofin



Mexico

Mexico's Federal Telecommunications Institute (Instituto Federal de Telecomunicaciones, IFT) has confirmed that it will tender additional wireless frequencies in the 1700MHz and 2.5GHz bands in 2019. The AWS spectrum in question will be a 2x5MHz block in the 1755MHz-1760MHz/2155MHz-2160MHz range, while the 2.5GHz spectrum will comprise frequencies in

the 2500MHz-2530MHz/2620MHz-2650MHz bands. In addition, the 824MHz-849MHz/869MHz-894MHz will be made available for 'social use'. Last month the IFT successfully freed up the 600MHz band, paving the way for the frequencies to be repurposed for 5G mobile use. The 600MHz band could be auctioned as early as 1Q19, local reports have suggested.

(November 14, 2018) telegeography.com



New Zealand

UK-based Dense Air has completed the acquisition of 70MHz of 2.5GHz spectrum management rights from Blue Reach and Cayman Wireless in New Zealand. The Slough-based company – an operating unit of the Airspan Group – bills itself as a 'new class of wholesale network operator', which seeks to use a comprehensive portfolio of 4G and 5G small cells to offer services to mobile operators for network densification purposes. The acquired spectrum assets in New Zealand will enable Dense Air to start its operations almost immediately. Paul Senior, CEO of Dense Air, clarified: 'Importantly, Dense Air doesn't and won't compete in any way with existing retail service providers. Our mission is to help MNOs and MVNOs improve their business cases for pervasive 4G and 5G networks by densification.' One of the selling parties, Blue Reach, is the wireless broadband company set up by CallPlus co-founder Malcolm Dick. Cayman Wireless is believed to be an affiliate of Craig Wireless

(which owns a subsidiary called Cayman Spectrum); Craig Wireless previously held spectrum management rights covering the 2500MHz-2520MHz and 2620MHz-2640MHz bands. Prior to July 2018 Dense Air was known as Airspan Spectrum Holdings. Interestingly, in May 2017 Airspan Spectrum Holdings successfully bid in the 3.5GHz/3.7GHz spectrum sale held by Ireland's Commission for Communications Regulation (ComReg). Airspan acquired 25MHz in all rural regions and 60MHz in all cities for EUR7.6 million (USD8.7 million). It remains to be seen whether the company will employ a similar small cell/wholesale strategy in Ireland, although TeleGeography understands that Dense Air was contracted to build a 3.5GHz 5G trial network for Dublin City Council in April 2018, as part of the 'Smart Dublin' initiative. Separately, Airspan Spectrum Holdings came away empty-handed after Ofcom's April 2018 auction of UK spectrum in the 2.3GHz and 3.4GHz bands. (November 23, 2018) telegeography.com



Niger

The Council of Ministers has adopted three draft decrees formulated by the Ministry of Posts, Telecommunications and the Digital Economy. The move follows the adoption of Law No. 2018-45 of 12 July 2018 regulating electronic communications in Niger and Law No. 2018-47 of 12 July 2018, establishing, organising and operating the Regulatory Authority for Electronic Communications and Post (Autorite de Regulation des Communications Electroniques et de la Poste, ARCEP), both of which made the necessary adjustments to enable Niger to comply with additional directives of the Economic Community of West African States (ECOWAS) and the West African Economic and

Monetary Union (WAEMU), in order to contribute to the creation of a common market for ICT in the community area. The first newly-adopted draft decree outlines the guidelines, priorities and funding for universal access to electronic communications services, while the second concerns the establishment and control of tariffs, including the terms and conditions that operators may use to set rates for the services they provide to the public. Finally, the third decree lays down the general conditions for interconnection and access, including local loop unbundling (LLU), the potential for licensing MVNOs and the identification of relevant markets to improve the competitive environment.

(October 24, 2018) telegeography.com



Nigeria

The recent broadband price war between bigger and smaller operators will soon come to an end, the Nigerian Communications Commission (NCC) has said. To address the industry challenge, NCC said it would soon release a new cost-based pricing for retail broadband that would give smaller operators competitive advantage to remain in business. The Director, Licensing and Authorization at NCC, Ms. Funlola Akiode, who made the disclosure at the recent

stakeholders' consultative forum held in Lagos, said the decision to release a new cost-based pricing for retail broadband, arose from a forum held last year, where the issue of anti-competition in retail broadband services was raised. "We are currently in the process of finalizing the determination of cost-based pricing for retail broadband and data services aimed at addressing the issue of competition in this segment of the industry. "It is heart-warming to note

that arising from the stakeholders' consultative forum held last year, the commission came up with some initiatives to address some of the challenges identified," Akiode said. The Executive Vice Chairman of NCC, Prof. Umaru Garba Danbatta, reminded selected operators who were invited to the forum that there were existing Service Level Agreements (SLA) and codes of conduct that, when appropriately implemented, would guarantee conducive operating environment that would significantly reduce the need for regulatory intervention. Danbatta, who was represented by Akiode, particularly mentioned the Code of Corporate Governance for the telecoms industry, and expressed the Commission's concern that much of the problems bedeviling the industry could, arguably, be traced to lax governance standards. "We expect all licensees, including those for whom the Code is not yet mandatory, to review their governance practices to better conform to the Code," Danbatta said. Akiode, who listed some of the challenges in the telecoms sector to include competition with major operators in the retail segment, inadequate frequency spectrum allocation and interference on the unlicensed frequency bands, fluctuations in foreign exchange and access to loans/funding to roll out service or sustain their business, said as a responsive regulator, NCC has reviewed some of the concerns and issues and would soon address them amicably. Akiode called for the cooperation and support of industry stakeholders and licensees with regards to compliance with extant laws noted that most operators were not compliant with the laws "With respect to compliance with license terms, conditions and obligations, our recent audit checks revealed that some licensees were not in compliance with obligations such as payment of Annual Operating Levy (AOL), approved Individual Consumer Code of Practice (ICCP), Type approval of equipment, submission of statistical data and informing the Commission on their change of address. "Another important concern is in the area of license renewal. We also observed the issue of delay in license renewal by licensees whose licenses have expired or about to expire," Akiode said.

(November 24, 2018) economicconfidential.com

The Nigerian Communications Commission (NCC) has approved the takeover of 9mobile, the country's fourth largest wireless operator by subscribers, by Teleology Holdings. Reuters cites a statement from the investment consortium as saying that it has appointed a new board of directors to run the indebted cellco, after receiving final clearance for the deal by the NCC. In February Gibraltar-registered Teleology, which is led by former MTN Nigeria executive Adrian Wood, emerged as the preferred bidder for 9mobile (known as Etisalat Nigeria until July 2017), outbidding pan-African LTE operator Smile Telecoms. The bid process was arranged by Barclays Africa, after a debt default forced 9mobile's lenders to step in. Teleology reportedly raised the USD251 million bid balance by the payment deadline, following which the NCC launched a review of the buyer's financial and technical capacity.

(November 13, 2018) reuters.com

The Nigerian Communications Commission (NCC) has awarded a further three regional infrastructure company (InfraCo) licenses, which allow for the deployment of metropolitan fiber-optic infrastructure and associated transmission equipment on an open access, non-discriminatory and price-regulated basis. The Sammya Limited (formerly Odua Telecoms) was licensed for the North West region (excluding Lagos), while Fleek Networks Limited won the bid for the North West zone and Raeanna Nigeria Limited has been licensed to build broadband infrastructure in the South region. MainOne Cable and IHS secured the first two concessions – for Lagos State and the North Central region, respectively – back in January 2015, with Zinox Technologies later licensed for the South East region and Brinks Integrated Solutions authorized for the North West zone. In August 2018, however, it was reported that IHS had returned its InfraCo license following difficulties in securing right of way approval from local state governments to deploy infrastructure in the North Central zone. (October 29, 2018) The Punch Daily



Peru

The Ministry of Transport and Communications (Ministerio de Transportes y Comunicaciones, MTC) has approved a decree to re-order spectrum allocations. The reshuffle looks to more efficiently order the spectrum bands used by telcos with the intention of improving service quality for end-users and paving the way for future 5G frequency assignments. The first set of spectrum re-allocations is due to take place in the first half of 2019, with the MTC claiming that customers should be able to see 'concrete' results by the end of the year. Specific details regarding this first tranche of spectrum to be re-organized were not published, however. Included in the new regulations are mechanisms that will add rollout obligations to existing

license holders as a means to compensate the state for the increased value of their spectrum holdings, the Ministry explained in its press release. The MTC went on to say: 'As a result of the rearrangement of the frequency bands, it is expected that telecommunications services for citizens will improve, that competition in the sector will be promoted and that the Peruvian market will be more attractive [to investors]. In this way, greater deployment of infrastructure will be generated, [along with] better coverage of mobile services, the progressive implementation of new technologies (for example, 5G) and will lead to the narrowing of the digital divide in areas lacking telecommunications services.'

(November 7, 2018) telegeography.com



Philippines

A consortium led by China Telecom have provisionally been named the Philippines' third telco, after submitting the sole qualifying bid in the third telco selection process. The consortium, consisting of China Telecom, Philippines holding company Udenna Corporation and the Mindanao Islamic Telephone Company, was one of only three companies to have submitted bids for the third telco slot, CNN Philippines reported. The Mindanao Islamic Telephone Company was granted a congressional franchise in 1998, but that appears to have been dormant since then. The company has not listed on the stock market or launched commercial services. Under Philippine regulations, telecoms operators are required to be at least 40% locally owned, so China Telecom was required to form local partnerships to participate in the process. Philippine Telegraph and Telephone (PT&T) and the SEAR Telecom Consortium, the two other bidders in the beauty contest style selection process, were disqualified on the grounds that their documents were allegedly incomplete. Both bidders have vowed to appeal the decision with telecoms regulator NTC. The seven other companies and consortia to purchase bid documents did not submit them in time for the deadline. One of these, local ISP NOW Telecom, failed in its attempt to secure a court injunction on the selection process, but has now escalated its legal dispute with the NTC. In its bid documents, Mislattel pledged to invest between 40 billion and 140 billion pesos (\$759.6 million to \$2.66 billion) in its first year in operation to achieve a coverage area of 10% to 50% of the market, and to deliver speeds of 5Mbps minimum and 55Mbps maximum for the next five years.

(November 10, 2018) vtelecomasia.net

The telecoms regulator, the National Telecommunications Commission (NTC) confirmed that a tenth firm – AMA Telecommunications Corp – has joined the race to become the country's New Major Player (NMP). In a text message, the NTC said that AMA Telecommunications, which secured a Congressional franchise in 2016 to construct, install, establish, operate and maintain telecommunications systems in the Philippines, had paid the PHP1 million (USD19,000) fee for selection documents, taking the total number of confirmed participants to date into double figures. The industry watchdog also noted that Converge ICT is indeed one of the two previously unidentified buyers of bid documents, after Converge ICT president Dennis Anthony Uy visited the NTC in Quezon City 'to emphasize that it was his firm that made the purchase'. Earlier, Uy had suggested his firm would not take part, preferring instead to focus on boosting its fiber internet business after setting aside USD1.8 billion for a 'massive network project'. Converge ICT previously revealed it would partner with South Korean telco KT Corp to vie for the slot. The government still hopes to

name the third telco player before Christmas.

(November 1, 2018) telegeography.com

The Department of Information and Communications Technology (DICT) committed to wrap up a series of policies to further level the playing field in the telco sector as it seeks to choose a challenger to incumbents PLDT Inc. and Globe Telecom by next month. Chief among these were rules for the reallocation of valuable radio frequencies, including those held by PLDT and Globe, and a policy for sharing cell towers. These were expected to help the viability of an incoming third telco player and to reform dated regulations. During an explanatory hearing chaired by Sen. Grace Poe on Monday, DICT acting secretary Eliseo Rio Jr. said the rules for the "equitable distribution of frequencies" would be ready by the first quarter of 2019. Radio frequencies, a set of which will be awarded to the third telco player, are essential in providing mobile services such as calls, text messaging and internet browsing. Should the government succeed in luring a third player, the PLDT Group would control about 40 percent of the mobile frequencies, followed by Globe at 35 percent and the third player at 25 percent. Pierre Galla, co-founder at advocacy group Democracy.Net.PH, said during the hearing that the spectrum to be allocated to the third player is sufficient. He explained that a company with smaller frequency holdings can offset the shortfall by building more cell towers, a strategy he said was successfully executed by Thailand's dtac, part of Norway's Telenor Group. Telenor is among the companies that acquired bid documents in the DICT's third telco selection process. Rio said a third player, which will start with zero customers against over 100 million subscribers between PLDT and Globe, will have enough frequencies to start its mobile business. During the hearing, the DICT secretary also appealed to lawmakers to pass legislation to support spectrum management reform. "If a law is passed it will make our jobs easier," said Rio, as he described the complicated process the National Telecommunications Commission would need to undergo to reallocate frequencies. Another key initiative is the common tower policy, which Rio said would be finalized before the end of the year. During the hearing, Rio said he was not inclined to approve the current draft of the common tower rules, citing key portions that prohibit PLDT and Globe from building new towers. Rio explained that he was wary about legal challenges from the incumbents, both of whom argued that such a provision would violate their franchises from Congress. Rio's stance puts him at odds with Ramon Jacinto, the Presidential Adviser on Economic Affairs and ICT who holds oversight functions over the common tower policy. Jacinto, a champion of the controversial provision, said "majority of participants" at a recent public hearing on the matter supported his views. "Secretary Rio and I work

well together. He called the public forum. He normally follows the results of the public forum," Jacinto said. During the hearing, Rio reiterated their commitment to choose a third mobile player by November. The bid deadline has been set on November 7, 2018. So far, eight companies have acquired bid documents, including

China Telecom, Telenor and Mobitel Holding of Austria. Rio said that while the prospective third telco would be known this year, the license would be awarded by early 2019. After this, he expects the company to start rolling out services in around six months.

(October 23, 2018) business.inquirer.net



Spain

Roberto Sanchez, Director General of the Ministry of Economy and Enterprise (Ministerio de Economía y Empresa, MINECO), has informed the Spanish media that the auction of spectrum in the 5G-suitable 694MHz-790MHz ('700MHz') band will now take place in early 2020, rather than in the first quarter of 2019, as previously suggested. The spectrum – referred to as the 'second digital dividend band' – is currently utilized for Digital Terrestrial Television (DTT) services but will be freed up by March 2020. MINECO is keen to avoid a repeat of what happened with the 800MHz band, which was auctioned in 2011, but not actually made available to the winning bidders until 2015. In late October Spanish Prime Minister Pedro Sanchez announced that the government intended to stage an auction for 700MHz spectrum in the first quarter of 2019. The projected auction forms part of the government's 'Plan Nacional 5G'. (November 22, 2018) telegeography.com

Spanish Prime Minister Pedro Sanchez has indicated that the government intends to auction spectrum in

the 694MHz-790MHz ('700MHz') band in the first quarter of 2019, with a view to supporting the country's 5G deployments. The spectrum – referred to as the 'second digital dividend band' – is currently utilized for Digital Terrestrial Television (DTT) services, but will be freed up by March 2020. Mr. Sanchez made the claims during the closing ceremony of the XXI Congreso Nacional del Instituto de Empresa Familiar event, Europa Press reports. The planned sale process will represent the second auction of 5G-suitable spectrum in Spain. In July 2018 the Ministry of Economy and Enterprise (Ministerio de Economía y Empresa, MINECO) generated EUR437.6 million (USD495.8 million) through the sale of 3.6GHz-3.8GHz spectrum. Vodafone Spain dominated the bidding, paying EUR198.1 million for 18 5MHz blocks. Orange Espana was next in line, bidding EUR132.1 million for twelve 5MHz blocks, while Telefonica Espana (Movistar) offered EUR107.4 million for the remaining ten 5MHz blocks. All concessions are valid for 20 years.

(November 1, 2018) telegeography.com



Thailand

The telecom committee of Thailand's National Broadcasting and Telecommunications Commission (NBTC) has approved draft regulation covering the recall of unused spectrum for its allocation for 5G. The draft regulation will enable the regulator to recall spectrum slots, many of which are held by state agencies including state-owned operator CAT and public broadcaster MCOT, and reassign them via auction. The draft also allows the regulator to pay compensation to current spectrum holders in exchange for the return of the spectrum. Now the full NBTC board must officially approve the draft regulation. The board plans to hold a meeting on November 20 with the aim of putting the regulation into effect at the start of December. The NBTC plans to recall and auction spectrum in at least three bands, the report states. These will include the 2600-MHz, 1500-MHz and 2300-MHz bands. MCOT currently holds 190MHz of spectrum in the 2600-MHz band under a concession set to expire in 2022. The company has previously agreed to return 90MHz of unused bandwidth in the band to the regulator in return for compensation. Meanwhile CAT is using 35MHz of spectrum in the 1500-MHz band for signal transmission services. (November 11, 2018) telecomasia.net

DTAC TriNet, a subsidiary of Thai operator Total Access Communication (DTAC), has won 2x5MHz in the 900MHz band for THB38.06 billion (USD1.14 billion) in an auction held by the National Broadcasting and Telecommunications Commission (NBTC). The TriNet was the sole bidder in the auction. DTAC will be allowed to operate in the 850MHz band for another 24 months during the switching from the 850MHz to 900MHz band due to hardware upgrades across the nation, according to NBTC's Director-General Takorn Tantasith. (October 29, 2018) The Bangkok Post

Thailand's National Broadcasting and Telecommunications Commission (NBTC) is planning to sell the remaining 35MHz in the 1800MHz band in February 2019. The regulator is also aiming to extend the payment period for the spectrum to eight-ten years, from the current three-year regimen, in order to attract potential bidders. The auction will be for seven slots of 2x5MHz each with a minimum reserve price of THB12.48 billion (USD379 million), and will comprise DTAC's spectrum, the authorization for which expired in September 2017. Following the conclusion of the 1800MHz auction, the NBTC will hold a tender for 5G

airwaves. Takorn Tantasith, secretary-general of the NBTC, said that the authority will tender frequencies in the 700MHz and 2600MHz bands with the stipulation that winners are given slots in higher spectrum bands as well, such as the 3500MHz-3800MHz and 23GHz-28GHz ranges (partly occupied by Thaicom, but set

to be recalled by the NBTC). The official also said that 'the 5G frequencies should have a reasonable starting price to avoid creating untenable financial burdens for operators'. The 700MHz spectrum band is currently used for digital TV broadcasting, but it will be vacated for telecoms use in 2020. (October 24, 2018) The Bangkok Post



Ukraine

Ukraine's Supreme Court has dismissed state-owned UkrEximbank's UAH1.1 billion (USD39 million) claim against nationwide fixed line operator Ukrtelecom. Ukrtelecom had failed to fulfil its 2015 pledge to buy out the bonds of its holding company ESU (owned by conglomerate SCM) for UAH2 billion from UkrEximbank and another state bank Oshchadbank, but the apex court ruled that UkrEximbank cannot charge Ukrtelecom for bonds that the company itself never bought. The decision partly found in favor of UkrEximbank, obligating Ukrtelecom to pay fines and

interest of UAH880,000. According to a memorandum signed in September 2015 between Ukrtelecom, ESU, UkrEximbank and Oshchadbank, money from the planned sale of Ukrtelecom's 3G cellular division TriMob – which subsequently failed – was earmarked for buying out ESU bonds. ESU continues to be involved in a similar UAH2.83 billion legal dispute with UkrEximbank and Oshchadbank over the bonds – the maturity date of which expired in March 2017.

(October 29, 2018)The Kyiv Post



United Kingdom

The UK Department for Digital, Culture, Media & Sport (DCMS) has launched two consultations related to gigabit connectivity in Britain. The first seeks feedback on proposals that would make it a requirement for developers and operators to provide gigabit-capable connections to all new homes. With the state having set what is has termed an 'ambitious' target of making gigabit-capable networks available to 15 million premises by 2025 – ahead of nationwide coverage by 2033 – DCMS is proposing: that developers and network operators should share the cost of connecting new build sites to gigabit-capable networks; that a 'duty to connect' provision upon network operators would be introduced; and that Building Regulations Approved Document Part R: (Physical infrastructure for high speed electronic communications networks) is to be amended, meaning so that all new build sites will be built with the necessary infrastructure in place to support gigabit-capable networks. In its second consultation, meanwhile, DCMS has called for thoughts on proposals which it claims would make it easier for commercial and residential tenants to access 'high quality and reliable' broadband connections. As per

the government's plans in this area, is has proposed: amending the Electronic Communications Code to place an obligation on landlords to facilitate the deployment of digital infrastructure when they receive a request from their tenants; and enabling communications providers to use magistrates' courts to gain entry to properties where a landlord fails to respond to requests for improved or new digital infrastructure. Submissions to both of the aforementioned consultations are being accepted until December 21, 2018. In related news, as part of the UK government's budget. It was confirmed that GBP200 million (USD256 million) will be committed from the National Productivity Infrastructure Fund (NPIF) to pilot new approaches to deploying full fiber connectivity to rural locations 'to ensure no region is left behind when it comes to connectivity'. The initial wave of funding is expected to be directed towards primary schools in Cornwall, the border region between England and Scotland, and Wales. Residents, while businesses and residents near these schools are expected to be able to upgrade their broadband connections using the government's Gigabit Broadband Voucher Scheme (GBVS). (October 30, 2018) The Financial Times



United States

Senior officials warned the US Federal Communications Commission (FCC) won't tolerate operators sitting on valuable mmWave spectrum as an auction opened, noting the agency plans to more rigorously enforce license requirements. The comments came a day before the start of bidding in the FCC's 28GHz auction. In a call with journalists, the FCC said it had set strict performance requirements for the licenses to encourage the swift rollout of 5G services and will take dim view

on any attempt to seek a waiver of the requirements ahead of construction deadlines. They added the bar for waivers has been set high, with companies required to prove they face extraordinary circumstances before such requests are granted. A similarly stern stance will be adopted for licenses in the 24GHz band, which are due to be auctioned following the 28GHz procedure. FCC officials said the agency is also looking to prevent other abuses in the mmWave auctions, highlighting the

implementation of monetary caps on the discounts typically received by small and rural operators. This is meant to discourage companies from attempting to take advantage of the discount program by bidding through smaller entities; something Dish Network was accused of doing in an AWS-3 auction in 2015. A total of 3,072 licenses offered in 425MHz blocks are up for grabs in the 28GHz auction, covering around half of the counties in the US. Verizon is the primary incumbent in the band, though AT&T and T-Mobile US also hold a smaller number of 28GHz licenses. The officials said there is no set end date to the 28GHz auction, noting it will close when there is no more bidding activity on any of the available licenses. (November 14, 2018) mobileworldlive.com

The US Federal Communications Commission (FCC) adopted changes to its rules for the 3.5GHz band despite harsh criticism from one member, shifting to larger license areas and longer terms favored by major operators eyeing the spectrum for 5G. Changes adopted by the FCC on Tuesday (23 October) accommodate operator demands, increasing the license zones from small geographic areas known as census tracts to county-wide, extending the duration from three years to ten years and making the licenses renewable. The order also ensures seven priority licenses will be available in each area, which can be partitioned to enable license holders to lease some of their spectrum on the secondary market. In 2015, the FCC designated 3.5GHz as an innovation band, with a three-tier access framework to encourage sharing between incumbents,

licensed and general users, and census tract licenses to enable hyper-local deployments. The band is also known as the Citizens Broadband Radio Service (CBRS) in the US. However, large operators complained they could not justify investments in the band with such limited licenses and Commissioner Michael O'Rielly who spearheaded the FCC's effort to overhaul the rules, said "it was clear during a review that the past administration rules were not supportive of large-scale deployments". The changes were welcomed by players including industry association CTIA and operator AT&T, the latter of which said they provide "necessary clarity and certainty" to support the delivery of LTE and 5G services in the band. However, Commissioner Jessica Rosenworcel (pictured, far left) blasted the shift as "shortsighted" and "at odds with what is needed for a successful future". "We take what was most innovative about the 3.5GHz band model and cast it aside in favor of existing business models," she commented. Adoption of the rules comes ahead of expected commercial deployments in the band from Verizon and others by the year-end, and shortly after Qualcomm and Ericsson announced the successful completion of a standards-based 5G call over 3.5GHz using a mobile test device in a laboratory. The Commission also proposed new rules which would open up a 1,200MHz channel of spectrum in the 6GHz band for unlicensed use. Wi-Fi Alliance applauded the move, hailing the FCC for taking "an important step towards preserving broadband wireless connectivity for millions of Americans and creating new opportunities for the next generation of Wi-Fi". (October 24, 2018) mobileworldlive.com 

A satellite with large blue solar panels is shown in space, with a red laser beam pointing towards the Earth's horizon. The Earth is visible at the bottom of the frame, showing green land and blue oceans.

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