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47

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Jerome Henique

Chief Executive Officer
Orange, Jordan Telecom Group

DIGITAL PLATFORMS AND SERVICES: OPERATING IN THE OTT ENVIRONMENT

4G⁺

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SAMENA TRENDS

Editor-in-Chief
Bocar A. BA

Contributing Editors
Izhar Ahmad
Javaid Akhtar Malik

Contributing Members
Arthur D. Little
Etisalat
Nokia
Strategy&
Sudatel

Publisher
SAMENA Telecommunications Council

Subscriptions
subscriptions@samenacouncil.org

Advertising
ads@samenacouncil.org

Legal Issues or Concerns
legal@samenacouncil.org

SAMENA TRENDS
trends@samenacouncil.org
Tel: +971.4.364.2700



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CONTENTS

04 EDITORIAL

09 REGIONAL & MEMBERS UPDATES

- Members News
- Regional News

36 SATELLITE UPDATES

- Satellite News

49 WHOLESALE UPDATES

- Wholesale News

55 TECHNOLOGY UPDATES

- Technology News

70 REGULATORY & POLICY UPDATES

- Regulatory News
- A Snapshot of Regulatory Activities in the SAMENA Region
- Regulatory Activities Beyond the SAMENA Region

ARTICLES

18 Digital Platforms and Services: Operating in the OTT Environment

33 Building the Industry 4.0 Enterprise

47 Transforming Government Services: The Value of Government Cloud Enablement Platform

68 Reducing Complexity in the Roaming Business

78 Socio-Telecom link in Mauritania



05

FEATURED

Jerome Henique
Chief Executive Officer
Orange, Jordan Telecom Group

CONTENTS

Digital Platforms and Services: Operating in the OTT Environment

A growing number of choices, innovative offerings, and a greater realization of the role of over-the-top services in the lives of the digital consumers have made it clear that we are operating in the age of digital platforms and services - many of which are using and will continue to use infrastructure that is built by telecom operators.

Time spent using digital platforms and services will continue to increase exponentially over the foreseeable future. It is amidst this evolution that user behaviors have been transforming over the past several years while traditional communication services have been facing a decline. With new business models and digital breakthroughs emerging, operating in the over-the-top environment poses new demands for all stakeholders of the digital communications industry.

For telecom operators, specific focus should be placed on combining core competencies and years of experience in providing basic telephony services with opportunities in digital technologies.

For operators, seeking improvements in operational efficiency and cost structures usually implies more investments in advanced networks. However, many inefficiencies are not related directly to the network but to the growth phases that operators have been going through. Complexities that operators need to rule out in order to transition forward into the digital realm as successful digital communication service providers range from being more innovative and forward-thinking, being more creative in utilizing existing assets (for example, existing customer bases and partnerships), to being more partnership oriented with regard to providers of disruptive digital services.

We have discussed in several meetings organized by SAMENA Council that the true value of digital needs to be captured, for it is in digital that future success lies for all players of the digital ecosystem -- including regulators, policy-makers, and the general public. Both business transactions and always-on access to communication services, as enabled by digital, are, in many ways, resulting in communication intensity, which, in turn, will give rise to further innovations within the industry as well as the society.

Working in such an environment of communication intensity requires a level-playing field; transformation in the telecom-only mindset; fairness and relevance in regulation; and industry co-operation like never seen before. All of these factors are crucial to effectively operating in the OTT environment, for the expectations from the digital communications industry are now much more complex and intertwined than they have ever been. In essence, the core imperative in view of these trends and new realities of the marketplace is that all forms of internal inefficiencies at the operational level need to be eliminated, to be able to successfully manage complexities that now exist externally in the new digital environment.

Investments need to be sustained toward innovating and new digital products and services need to comply with new end-user behaviors, requirements, needs, and increasingly more well-defined privacy and data protection goals. There is also a need for greater predictability and regulatory certainty. The digital communications industry, while having overcome many evolutionary challenges, continues to struggle in addressing some basic regulatory reform requirements, which can help make the most of the new OTT environment.

For telecom operators, specific focus should be placed on combining core competencies and years of experience



Bocar A. BA
Chief Executive Officer
SAMENA Telecommunications
Council

in providing basic telephony services with opportunities in digital technologies. It is time to execute multiple options in parallel, including but not limited to, offering connected platforms for smart homes, digital entertainment, and secure-cloud and data services for individual consumers, and taking greater interest in introducing social and community-based offerings that contribute to the fulfillment of national digital agenda as well as global ICT goals.

Such are some of the core demands of the new OTT environment. [\[E\]](#)



Jerome Henique
Chief Executive Officer
Orange, Jordan Telecom Group



The Age of Digital Transformation and New Possibilities

Q. In view of digital transformation trends around the region, how do you view the correlation between Jordan's overall national economic policy and the national ICT vision?

A. Over the past two years, we have witnessed great strides towards the digitization of the national economy; higher penetration levels for mobile and broadband services, higher usage of smart devices, greater use of apps and increased local content.

Over time, ICT became an integral and essential aspect of Jordanian life; like: greater presence on social media, increased amounts of financial payment through electronic means and increased number of e-Government services. Such developments would not have been possible without a national ICT vision that maintained a fair competitive environment that attracts and encourages further investment in the sector, which translates into the development of innovative, competitive and affordable products and services which satisfy customer needs.

Over time, ICT became an integral and essential aspect of Jordanian life; like: greater presence on social media, increased amounts of financial payment through electronic means and increased number of e-Government services.

At Orange Jordan, we strongly believe that ICT is the main engine of economic growth and job creation through harnessing the energy, creativity and talents of its educated youth.

With the last Government announcement of the Internet-for-All initiative, and the establishment of the committee chaired by the Minister of ICT with members of CEOs of TRC & main telecom operators, ICT stakeholders and international

organizations will help to constitute a cornerstone for the next wave of digitization in the Jordanian economy by enabling everybody's participation in the realization of economic development in the Kingdom. At the same time, unfortunately one can only witness that despite its contribution to the GDP growth, ICT sector level of taxation in Jordan is continuously increasing and reaches one of the highest levels in the world.

Q. What are the new possibilities that you would like to see created through improved operator-regulator co-operation?

A. We believe that co-operation between regulators and operators should focus on maintaining and improving modern infrastructure and enhancing customer choice for mobile services.

Infrastructure provides a platform for new products and services development and innovation. The economic benefits of ICT cannot be delivered to the economy and society without such infrastructure. As such, it is important that the ICT infrastructure be continually maintained at the levels found in competing economies and more incentives should be designed to encourage the roll out of such infrastructure.

On the other hand, competition and customers in the mobile market choice should be further enhanced by enabling Mobile Number Portability (MNP), which is still missing despite the fact that that MNP has been implemented across most mature markets as well as emerging markets the world.

Q. How does Orange Jordan view the focus on digital services and the availability of resources such as spectrum, incentives and reduced industry fees and taxation?

A. Orange Jordan is keen to continue investing in innovative services and enhancing the quality of service throughout Jordan. Therefore, we believe that sufficient spectrum availability is necessary to cope with the exponential growth of data consumption for mobile

broadband services and to sustain mobile capacity to provide the broadband services in a manner that meet customers' expectation with high quality.

Moreover, due to the exponential increase in data traffic in mobile networks and spectrum bandwidth needed to support such increase; fair pricing techniques has become ever more important to support efficient spectrum allocation, promote healthy investment in networks and encourage sustainable competition to support affordable services. The amounts of spectrum returns paid by mobile operators have direct impact on the development of mobile services, consumers and quality of services. Therefore, spectrum should be priced according to the level of market demand in order to increase the diffusion of mobile services, which in turn works towards the growth of the national economy. The cost of telecom services is influenced by many variables, including sector-specific taxes, regulatory and industry fees. Some taxes and fees may be absorbed by operators in the form of lower profits, which in turn can reduce investment incentives for operators, whilst others may be passed through in terms of higher prices for consumers, or a combination of the two. Moreover, higher fees and taxes generate a number of potential distortions to the economy and may adversely impact economic and social growth. While tax and fees may deliver short-term benefits to governments, in the long run they may slow down the rate of socio-economic development and growth and these payments may not always align with the wider social and economic development goals.

We strongly believe that reducing sector tax and fees to align them with those that apply to other standard goods and services has the potential to stimulate investment in extending connectivity, increase telecom service adoption, deliver economic growth and deliver higher tax revenues for the government.

A proportion of the tax and fee savings may be passed through to consumers through more generous offers, and thus,

may contribute to extending both the number of connections and the volume of usage. By reducing taxes and fees on the telecom sector, the Government can not only increase digital inclusion and economic growth, but also recover higher tax and fee revenues through more efficient and broad-based taxation in the long run. We strongly believe that the Jordanian Economic Growth Stimulus Plan (2018-2022), which proposed a periodic review of the tax and fees imposed on the telecommunications sector is a step in the right direction to stimulate investment in the ICT sector given global trends in terms of increased data usage and lower voice usage. The telecom sector has been suffering for years from the accumulation and multiple taxes imposed on it by users and operators, which contributed to the decline in revenues and profits of the sector.

Q. What role does Orange Jordan wish to play in leading collaboration within the Jordanian market to accelerate digitization?

A. Since Orange Jordan entered the Jordanian market in 2000, it has been a leader in the Jordanian ICT sector, continuously introducing state-of-the-art technologies that ensure that its individual and enterprise customers remain connected at all times, wherever they are. Orange Jordan was the first telecommunications company to introduce the internet to the Kingdom and it became the first company in Jordan to introduce 2G and 3G services. Soon after, building on its excellence in being the leading provider of fast internet and in alignment with its five-year corporate strategy, Orange Jordan launched its 4G network in 2015. This was the same year that Essentials 2020 was introduced, with the main goal of connecting people to all that is essential to them. The strategy also focuses on five key drivers that will essentially drive Orange Jordan towards success for itself and its customers, including offering richer connectivity options, reinventing customer relationships, building a people-oriented and digital employer model, accompanying the transformation of enterprise customers and diversifying operations by effectively capitalizing its assets. Orange Jordan also led the

way in the introduction of new services, smart city, M2M, Big Data, cloud through tier one data center supported by the international know how of Orange Group.

Q. What is Orange Jordan's strategy to maximally capture the value of digital and to enrich customer experience?

A. Orange Jordan has been focusing on New Generation Networks (NGNs), which are a new era of networks representing the future of connectivity, including LTE, Fiber-To-The-Home (FTTH) for individual subscribers, Fiber-To-The-Business (FTTB) for enterprise customers, and IMS (IP Multimedia Subsystem). These NGNs, with their capacity to connect people in more ways and on a different level than ever before, make the idea of ultimate convergence in the telecommunications industry an achievable reality. Today, the company is heavily investing in this area to make them viable services for users in Jordan. Between the years 2017 and 2020, Orange Jordan will invest JD 250 million to further enhance and develop its infrastructure, which will go towards, in part, to developing its fixed and fiber networks, and increasing mobile broadband, providing an unmatched experience to its customers. More than 2,000 locations across the Kingdom are currently covered by 2G, 3G, and 4G networks with 95% of the country being covered by 4G/LTE, and by the end of 2020, fiber will be available to more than 50% of households across the Kingdom. Currently, we have already laid 6,000 kilometers of Fiber-To-The-Business (FTTB) cables and 700 kilometers of Fiber-To-The-Home (FTTH) cables.

Q. What trends in digital adoption is the Orange brand contributing to, regionally?

A. Orange Group through its global Essential 2020 strategy aims to provide customers with an unmatched digital experience which is implemented regionally in many MENA affiliate countries such as Egypt, Jordan, Morocco and Tunisia. This digital experience is manifested in many examples in Jordan including, the digitization of its touch points such as inaugurating the Kingdom's first Smart Store to drastically enhance and revolutionized the customer experience in the way we present our products and services, revamping our

user-friendly e-shop, which is especially designed to provide customers with an enjoyable digital shopping experience of its wide range of products and services from the comfort of their own home, and

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by launching the first and only e-care service in Jordan, which was designed for individuals and business sector customers of Orange Jordan to cater to their telecom and internet needs, allowing them to inquire about their balance, pay bills, provide suggestions, add or cancel services and message notifications, add internet, mobile or fixed lines to their bundles, and many other electronic services, which can all be accessed through "My Orange" Application.

Orange Jordan has also streamlined its focus on its internal work environment and employees processes, through being a digital and caring employer Orange Jordan and received accordingly the Top Employer certification award for two consecutive years by the Top Employers Institute.

Finally, to list one more example Orange Jordan introduced a large-capacity IP point of presence (PoP), the first of its kind in the Kingdom, which is located at its state-of-the-art data centers, and enables local and regional operators to conveniently access global IP services from Jordan other than points in Europe or the USA.

WOULD YOU LIVE IN A HOUSE WITH 50 DOORS?



*Then why are companies using up to
50 different security vendors?*



There's never been a better time for security that works together.

MEMBERS NEWS



STC Won GTB Innovation Award

STC, represented by the Wholesale Business Unit, won the innovation award that recognized the STC Roaming Wholesale Solution. STC developed the roaming services in partnership with IT Sector in STC and Zira company that meet the needs of WBU in their international roaming agreements with roaming partners, providing innovative solutions in dealing with Data Clearing house and Roaming Partners to achieve the maximum services and welfare of STC customers roaming around the world and optimize the traffic routing through the optimum international links and provide STC with the best competitive prices with a flexible and proactive solution that deals with traffic issues during its occurrence and avoid any human intervention mistakes.



STC Recorded a Remarkable Increase in Voice and Data Services

Dr. Khaled H. Biyari, STC Group CEO and during his participation at the Saudi Smart Cities Conference 2017 met Abdullatif bin Abdulmalik Al AlShaikh,

Minister of Municipal and Rural Affairs (MOMRA) and discussed the roll of the telecommunication sector and STC in particular to support the ministry to apply

the smart cities concept by spreading the broadband services and digitalizing the society.



Batelco Obtains World Teleport Association (WTA) Certification

Batelco, the region's prime teleport services provider, continues to provide world-class teleport services to satellite and VSAT operators, with the company's fully equipped teleport placing Bahrain on the global map of satellite operations. Adding to its achievements in this field, Batelco has obtained provisional certification for its Ras Abu Jarjur teleport from the WTA (World Teleport Association) under its Teleport Certification Programme. Batelco was awarded the provisional certification after going through a comprehensive process, which includes completing a +170 item questionnaire. The WTA analyzed the data based on standards established by its Certification Committee before issuing the provisional certification. Batelco Bahrain CEO Eng. Muna Al Hashemi said that Batelco was welcomed by the WTA as an Industry Patron Member in

2016 and the provisional certification is the next step which adds further weight to Batelco's global services portfolio. "Receiving the certification demonstrates the commitment of Batelco towards service excellence and promoting Bahrain as a global hub for services. The WTA is recognized for its high standards and reaching the stage of provisional certification is a very big achievement," noted Mrs. Al Hashemi. Batelco Chief Global Business Officer Adel Al-Daylami said that Batelco, as the Middle East's prime teleport services provider already delivers world-class teleport services to satellite operators. "We are proud that Batelco's teleport boasts 30,000 square meters of operational area with customers gaining access to the telecom's MPLS, SDH and Ethernet national and international networks in addition to diverse Internet uplinks. The

teleport presents an optimum choice for satellite and VSAT operators around the globe as it can run any application on any topology," said Mr. Al-Daylami. Batelco recognizes that the satellite industry is a key catalyst for the Bahraini economy, as it services a number of verticals including maritime, oil and gas, enterprise and broadcast. WTA's Teleport Certification Programme serves both teleport operators and their customers by creating an objective, transparent and internationally accepted method for teleport operators to document the quality of their operations for customers and strategic partners. It also provides a means for customers to select teleport vendors delivering the price-performance level that is appropriate for their applications.

Batelco Launches New Service Management Centre & ICT Lab

Batelco has launched a new Service Management Centre (SMC) and ICT Lab, the first and only one of its kind in the Kingdom of Bahrain. The new SMC and ICT Lab, located at Batelco Headquarters in Hamala, was officially opened by Batelco Bahrain CEO Eng. Muna Al Hashemi at a ceremony attended by Batelco senior executives, and SMC and ICT Lab staff. Batelco's SMC is a state-of-the-art facility designed and developed around the needs of Enterprise customers. The Centre handles end-to-end support for business customers from design and delivery of services and solutions to efficient fault handling, centered on the remote team working closely with the NOC (Network Operations Centre). All services are monitored around the clock, ensuring immediate action on customer interruptions. Batelco's Business Solutions Portfolio is unmatched in the Kingdom of Bahrain and with this latest enhancement which brings together Batelco's fault handling, network operations overview and the addition of an in-house ICT Lab, Batelco is confirmed as the leader in the enterprise communications arena in Bahrain and among the top in the region. The new ICT Lab, the only one of its kind in the Kingdom of Bahrain has been created to



build and test communications solutions ahead of their roll-out to customers, further enhancing the strength of the fully integrated services for Batelco's enterprise customers. Business customers are welcome to visit the new SMC and ICT Lab where experienced engineers are on hand to answer any questions and provide businesses with advice on the best solutions for their requirements. Eng. Al Hashemi said that Batelco has invested heavily to bring its vision for a fully integrated service center and development lab to reality. "We are really delighted with the outcome; the center is a huge success and any of our

business customers who have visited already have been really amazed with the level of expertise and support that is dedicated to their needs," she said. "Having end-to-end delivery and support under one roof with the added benefit of having a huge team of skilled Batelco personnel on-site meets our strategic needs and surpasses the demands of our enterprise customers," Eng. Al Hashemi added. Batelco's new facility will further enhance Batelco's position in the market as an ICT Solutions provider and demonstrate the Company's capability in delivering customized integrated solutions to meet customers' demands.



In Collaboration with MachinesTalk, Mobily Business Launches Fleet Management Service

Mobily Business launched fleet management service in the Saudi market in collaboration with MachinesTalk. This service comes in the continuous efforts of Mobily Business in developing advanced services for business sector in the Kingdom through collaboration with leading national companies that provide technical and digital solutions and continue its innovation in presenting IoT solutions. Majed Alotaibi, Senior Executive Officer Strategic Planning & Marketing, stressed on that, "providing fleet management service comply with Mobily Business strategy and its continuous

quest to support digital transformation and developing Telecom & IT market to achieve 2030 Kingdom Vision." This service will provide several IoT added value services which are provided to government and private sector. Mobily is also utilizing its technology in order to achieve operational efficiency, reducing cost, and accomplishing added values to organizations. Fleet management service allows clients to manage, monitor, and track company vehicles at any time and place. In addition to many other features comes with the service like; alert management when vehicles pass

designated zones or exceed speed limits, and it also provide the user with regular check schedule, monitoring vehicle's drivers and preparing periodic reports. Mobily Business rely on efficient and high quality infrastructure to provide this innovative service, and specialized technical staff with trusted international experience to manage a large number of its data centers around the Kingdom. Moreover; providing Telecom and IT solutions made Mobily a leader in this field on a regionally.



Cisco Launches Intent-Based Networking Solutions

Cisco has unveiled a new networking paradigm it is calling intent-based networking, with the aim of creating an intuitive system that anticipates actions, stops security threats in their tracks, and continues to evolve and learn. The new solutions are designed to help businesses to unlock new opportunities and solve previously unsolvable challenges in an era of increasing connectivity and distributed technology. They involve a shift from hardware-centric to software-driven networking to improve agility, productivity and performance. This new network is the result of years of research and development by Cisco to reinvent networking for an age where network

engineers managing hundreds of devices today will be expected to manage 1 million by 2020. "The network has never been more critical to business success, but it's also never been under more pressure," Cisco CEO Chuck Robbins said. "By building a more intuitive network, we are creating an intelligent platform with unmatched security for today and for the future that propels businesses forward and creates new opportunities for people and organizations everywhere." Today companies are managing their networks through traditional IT processes that are not sustainable in this new age. Cisco's approach creates an intuitive system that constantly learns, adapts, automates and

protects, to optimize network operations and defend against today's evolving threat landscape. With the vast majority of the world's internet traffic running on Cisco networks, the company has used its unique position to capture and analyze this immensely valuable data by providing IT with insights to spot anomalies and anticipate issues in real time, without compromising privacy. Already, 75 leading global enterprises and organizations are conducting early field trials with these next-generation networking solutions, including DB Systel GmbH, Jade University of Applied Sciences, NASA, Royal Caribbean Cruises Ltd., Scentsy, UZ Leuven and Wipro.



PCCW Global Wins Asia Communications Award – Project of the Year For its Fast and Flawless eSports Connectivity Solution

PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, has won the Project of the Year for its ground-breaking superfast connectivity solution developed specifically for competitive eSports gaming at the prestigious Asia Communications Awards held on May 24 in Singapore. The award-winning project saw PCCW Global acting as the international connectivity partner for the 2016 League of Legends Master Series (LMS) Summer Playoffs Grand Final in Hong Kong, during which the company lifted the eSports gamers' performance to new heights with its ultra-low latency, highly responsive service. Working against very tight deadlines, PCCW Global demonstrated once again its strong project management and consistent commitment to deliver the best quality service solutions at all times and under all conditions. The League of Legends is the ultimate competitive eSports competition during which gamers fight online in front of millions of viewers, sometimes exceeding 300 individual actions per minute. PCCW Global recognized the need for a superfast solution for these conditions, where the servers are located remotely from the gamers but the response times must be instantaneous, and worked to provide a very high-speed, low latency and highly responsive connectivity service to match. PCCW Global delivered the perfect solution in just 14 days, providing direct fiber connectivity between the event in Hong Kong and gaming servers in Taiwan. Superfast response times were made possible via two dedicated 1000 Mbps capacity fiber connections. High-speed Internet access provided by the team streamed live coverage of the five-hour LMS Summer Playoffs Grand Final worldwide in three languages via various

website platforms like Twitch and YouTube. The result was a flawless world-class experience for both professional gamers and spectators alike. Mr. Mike van den Bergh, Chief Marketing Officer of PCCW Global, said, "PCCW Global was extremely proud to receive the Asia Communications Award's Project of the Year. We have delivered both the best possible gaming experience for the professional players competing, and the best possible live



streaming experience for spectators around the world, ensuring super low latency and ultra-reliability for the full five-hour competition, with extensive onsite support. Our message here is simple – PCCW Global is 100% committed to eSports and a tailored connectivity solution for gamers globally." Following the successful delivery of its ground-breaking service at the League of Legends competition, PCCW Global has become the go-to connectivity partner for eSports around the world.



Nokia Shows How 4.9G Technology Will Reduce Network Latency on the Path to 5G at #MWCS17

Nokia is to demonstrate the role high-performance 4G technology will play on the path to 5G to ensure continuity-of-service when 5G technology is deployed. At Mobile World Congress Shanghai, Nokia will show its AirScale base station working with 4.9G technology to reduce network latency to less than two milliseconds, bringing performance closer to the latency levels 5G is expected to deliver. 5G will enable new applications, such as 'Industry 4.0' industrial automation, autonomous vehicles, remote healthcare and immersive virtual reality entertainment, each requiring massive bandwidth and extremely low levels of network latency. Initial deployments of 5G technology will be in highly populated megacity centers, where demands on existing LTE network resources from consumers and enterprises will remain high. By moving the performance of LTE networks closer to a 5G experience using Nokia's 4.9G technology, operators can support these higher-bandwidth applications on the path to 5G while ensuring continuity of service once 5G is initially deployed. In its demonstration at Mobile World Congress Shanghai, Nokia will employ 4.9G to reduce network latency to less than two milliseconds using a feature



that allows transmission time intervals to be shortened by 86 percent. This will leverage the Nokia AirScale base station, which will allow operators to support both 4.9G and 5G technology in a single unit to maximize speed and capacity as they migrate to 5G. Shiv Putcha, Associate Director, IDC Asia Pacific said: "With the move from 3G to LTE networks, shortened latency times were crucial for an improved mobile broadband user experience. With this demonstration, Nokia has set a new benchmark for LTE network latency performance, bringing it closer to the 5G levels needed for industry and enterprise applications. This will allow operators to

begin support for new applications and deliver service continuity as operators start rolling out 5G networks." Tero Peltola, head of the LTE business line at Nokia, said: "We are committed to helping operators evolve their networks in the most effective way, allowing them to anticipate and meet demands with higher performance where and when it is needed. We continue to evolve our 4G offering with 4.5G Pro and 4.9G technologies, and with this network latency demonstration we can show operators how they could use LTE to deliver higher-bandwidth industry and enterprise applications to more customers on their path to 5G."

Nokia Enables Companies in MENA to Capitalize on the Opportunities of IoT

Organizations across the world are investing in the digital transformation to remain relevant to their customers and survive disruption. The Internet of Things (IoT) is one element in this transformation journey and has the potential to transform every industry, even traditional ones. According to Dr. Muneer Zuhdi, Director of Solution Line Management in the Global Digital Economy Practice at Nokia (www.Nokia.com), IoT brings huge opportunities to businesses in MENA, looking to reduce cost, generate new revenue opportunities and enhance customer experience. "There are unlimited possibilities for the usage of IoT. IoT applications will define future cities and impact every aspect of people's lives. These applications aim to

make cities smart, safe, and sustainable. The goal is to improve the quality of people's lives, enhance their safety from natural or man-made disasters, and maximize the efficiency of the utilization of resources," he says. Nokia supports these IoT applications with a shared, secure, and scalable networks and platforms. "This enables our customers to minimize the incremental investment required to provide IoT applications, introduce new IoT applications without disruption to existing services, and ensure the end-to-end security for the new solutions." The IoT platform from Nokia, branded as IMPACT, comes pre-integrated with several use cases that improve people's lives while making

businesses and cities smart, safe, and sustainable. "Video analytics, for example, utilizes an advanced machine learning algorithm for crowd and traffic management, which helps with public safety. Smart lighting and fleet management enhances the sustainability of natural and business or city resources. Finally, applications like smart parking achieve multiple goals in terms of making people work and live smarter by eliminating time waste, generating new revenues for businesses or cities, and reducing road congestions, pollution, and fuel waste," says Dr. Zuhdi. He says IoT has been gaining great traction in Smart Cities and Nokia has been involved in multiple Smart City opportunities across

the MENA region, each with their own challenges and priorities. "Nokia is in a unique position to be the trusted partner for our customers on this journey. It starts with being able to utilize the expertise of Bell Labs to consult with our customers



and guide them on developing a strategy and plan that is tailored to their market." Nokia has all the building blocks for the Smart City end-to-end solution whether it is over fixed or mobile network. The solution is highlighted by the IMPACT IoT platform, which is a scalable, horizontal, and multi-tenant platform. It enables cities to securely host applications from multiple agencies in addition to their own applications. Nokia also provides the end to end security and services. "Nokia has also been investing in building ecosystem of partners focusing on different IoT applications and performing technology and market trials. This enables us to evaluate concept and expedite the delivery of new applications and use cases while partnering with the most innovative companies. Nokia can really help in every phase of this journey, from strategic planning to ensuring that the network is built right first time and

optimized for the smart city applications, to finally providing access to the most innovative use cases to cities and their businesses and residents," says Dr. Zuhdi. Security always remains a grave concern, particularly in the wake of recent ransomware attacks. He says it is important to evaluate the end-to-end security for the entire IoT solution, including devices, network, platform, cloud, and application security. This is the approach for the Nokia security products which include end-points, gateway, DNS, and platform security, along with certificate management, security management, and identity & access management. "The IMPACT IoT platform allows secured and authenticated collection of IoT data, which is only distributed to authorized applications and end users. The NetGuard End-point Security provides a network-based anti-malware solution combining monitoring, detection, and mitigation for smart devices and IoT end-points. When the IMPACT IoT platform detects abnormal traffic, it sends a notification to the application or end user and has the capability to update the firmware to fix a security hole or instruct the network to stop the device from transmitting." From a security perspective, firmware upgrades are crucial, particularly as IoT devices are expected to be an operation for a long time. Nokia has helped operators and enterprises globally to provide over-the-air (OTA) firmware updates to end device, such as in connected cars, to proactively address any security concern. "Companies across the entire value chain of the telecom sector have an excellent opportunity to not only

participate in this transformation but even to lead it. Nokia has been extremely active in IoT by optimizing our products to support IoT applications, investing in IoT technologies, acquiring innovative companies, collaborating with IoT technology leaders, and building IoT ecosystems to develop solutions covering different industries. This multi-prong approach enables Nokia to partner with our MENA customers in this IoT journey and provides them the most innovative end-to-end IoT solutions," says Dr Zuhdi. IoT and related technologies continue to evolve and Nokia has big plans. "The Nokia Worldwide IoT Network Grid (WING) will be available later this year and will offer both connectivity and managed services to businesses while enabling service providers to offer IoT services under their own brand. We have also recently announced the launch of our award-winning IMPACT IoT platform with pre-integrated solutions such as video analytics, Smart Parking, Smart Lighting, and Fleet Management. The connectivity will also include both LoRA and the newly standardized NB-IoT. We continue to engage globally with service providers, cities, and enterprises on the specific requirements in their unique markets. Meanwhile, we are continuing to invest in critical IoT verticals such as Smart City, public safety, connected utilities, connected vehicles, connected health, and connected homes. These verticals will enable our customers to provide their customers applications that enhance the quality of their lives, and enhance their environment and business sustainability while making them safer," he says.

Nokia Shanghai Bell Eyes IoT Opportunities

Nokia Shanghai Bell, a joint venture between leading telecom company Nokia Corp and a State-owned investment firm, said on Thursday that it will step up efforts to cash in on internet of things opportunities in sectors outside of its core telecom business in China. The company said it will ramp up resources to explore opportunities in energy, transportation, public utilities, radio and television and other sectors that internet of things technology will revolutionize. In May, Nokia signed agreements with State-owned investment company

China Huaxin Post & Telecommunication Economy Development Center to create a joint venture. The joint venture, branded as Nokia Shanghai Bell, is designed to integrate Alcatel-Lucent Shanghai Bell and Nokia's China operations. Nokia will own 50 percent plus one share of the new joint venture, with China Huaxin owning the remainder. The agreements are expected to close in July. Mike Wang, Nokia Corp's president in China, said the upcoming 5G mobile communication technology will have a profound impact on different industries, which will create

big opportunities. According to market research firm Gartner, around 26 billion devices will be connected to the internet by 2020, and the internet of things market volume will exceed \$1.9 trillion by then. Tao Ranting, executive vice-president of Nokia Shanghai Bell, said Nokia has already helped connect 1.2 billion devices to the internet globally. In China, it has built a network with local telecom carriers, which now manages around 8 million internet-connected devices. chinadaily.com.cn

Nokia and China Mobile Extend Ultra-Broadband Access and Intelligent Home Services to Homes across China

Espoo, Finland - Nokia and China Mobile are deploying millions of home gateways to provide residential customers across 29 different provinces in China with access to fiber-based ultra-broadband applications and intelligent home services. Under this contract, China Mobile will deploy home gateway units with Nokia's solution to over 30 million users during 2017. Using established fiber-to-the-home (FTTH) networks, which bring greater service experiences and gigabit speeds to customers, the new gateway will extend internet coverage in the home and enable IoT communications between devices and sensors. The ability to flexibly add software functions and enhanced analytics capabilities allows China Mobile to deploy and deliver a new intelligent home experience and associated services. Federico Guillén, President of Nokia's Fixed Networks Business Group, said: "This important announcement furthers Nokia's role as a key technology provider in China. Our home gateway solution provides China Mobile with the ultra-broadband access

technology they need to capitalize on IoT and deliver new services that support their evolving customer needs. We are very pleased to continue our close work with China Mobile and look forward to helping them deliver on their commitments." Roland Montagne, principal analyst at IDATE, said: "China Mobile is progressing fast as a converged telecommunications operator -- with more than 31 million FTTH subscribers -- and has proven it can successfully leverage its extensive fiber access network to deliver ultra-broadband applications such as 4K TV services and Gigabit access to customers across various provinces. With the addition of intelligent home gateway technology, China Mobile will be able to further differentiate its services, providing consumers with enhanced internet coverage in the

home and a more seamless experience for connecting various devices and sensors." This contract extends a



long-term fixed networks partnership between China Mobile and Nokia which also included the development of its GPON network for mobile backhaul.



Huawei and IDC Jointly Issue Cloud Enterprise Communications White Paper

Ahead of the upcoming Mobile World Congress Shanghai 2017, Huawei and International Data Corporation (IDC) have jointly issued their 'Cloud Enterprise Communications: Serving Digital Enterprises' white paper. The paper conveys the evolution trends of cloud

enterprise communications, market space, application value, and other key information on the industry. The white paper points out that enterprise communications technology serves as a primary tool that connects information and real-time decision-making. It

is one of the important supporting technologies for enterprises to achieve digital transformation. As the scope of communications grows dramatically, all types of communications have become more abundant, requirements on communication methods have evolved, and reconstructing enterprise communication services and experience methods has become an urgent task for enterprise service providers. In the cloud era, Huawei will upgrade its original enterprise communications services to cloud enterprise communications services based on cloud architecture. This will lead to quick delivery, on-demand payment, flexible deployment, self-service, open application programming interfaces (APIs), and other technology features brought by cloud computing. These features will provide enterprises with fully-connected networks, in-depth



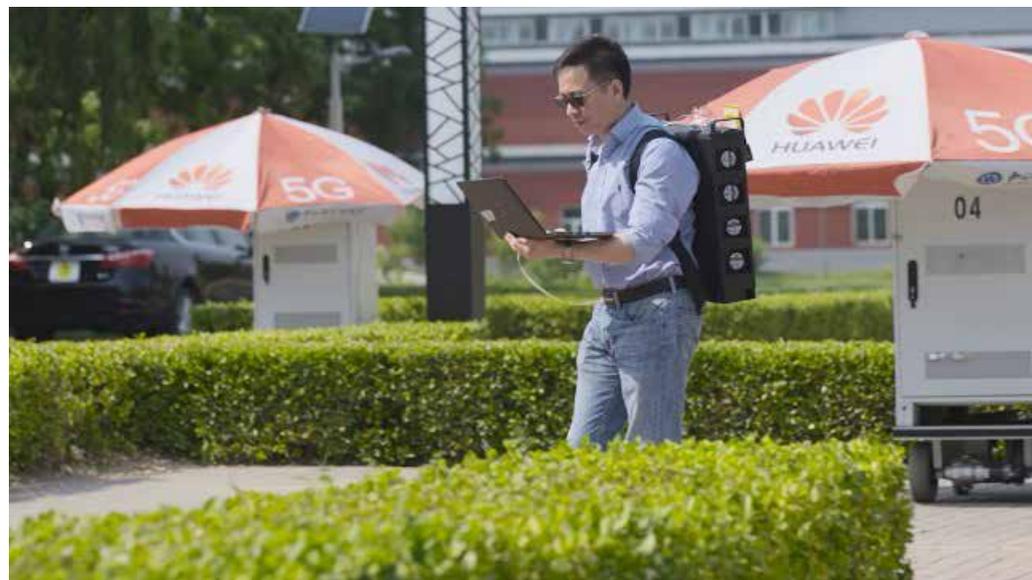
integration, and valuable innovation of enterprise cloud communications services, helping enterprises release the technological benefits brought by digital transformation. The white paper emphasizes that enterprise communications products that serve as ICT infrastructure and platform-based applications should be deployed (or migrated) preferentially to the cloud end. Currently, enterprise communications' deployment methods are going through an obvious transformation. According to IDC's Worldwide Enterprise Communications Market Forecast 2014-2019, the scope of cloud-based

architecture deployment surpassed that of on-premises deployment in the enterprise communications market for the first time in 2016. By 2019, cloud deployment will occupy up to 56.7% of the enterprise communications market. It is clear that the acceptance level for enterprise communications systems based on cloud is improving. Cloud deployment has become the first choice to deploy enterprise communications systems, resulting in cloud services becoming mainstream in the enterprise communications market. IDC believes that the cloud enterprise communications market has entered a period of fast growth

as the technology is becoming mature and the products, services, and business models are in place. The future holds huge industry markets and innovative application scenarios that are waiting for emerging cloud service providers to explore and engage in. Huawei is dedicated to deeply understanding enterprise needs. Huawei's Cloud enterprise communications solutions provide competitive platforms, and cloud services, developing a broad market space along with partners, expanding service scenarios with carrier customers, and achieving mutual benefits for enterprise users.

Huawei Leads with Completion of China's Second-Phase 5G R&D Test

Huawei leads with the completion of China's second-phase 5G radio technology test in Huairou District, Beijing. This test procedure was organized by IMT-2020 (5G) Promotion Group. During the C-Band test, Huawei adopted 5G New Radio, Massive MIMO, and other technologies using the entire 200 MHz bandwidth to achieve over 6 Gbps of single-user downlink throughput and over 18 Gbps of cell peak rate. The world's first Huawei 5G test terminal was utilized for radio technology verification. This terminal enabled more than 100 channels of on demand 4K UHD video in a single 5G base station. The clarity and smooth playback in vehicle-mounted mobile scenarios helped to demonstrate a superior experience offered by 5G C-Band Enhanced Mobile Broadband (eMBB). Huawei is the first to complete 5G network slicing test to meet diversified service requirements in three typical scenarios. Network slices enjoy flexible configuration with excellent cooperation between the air interface and network to provide a more secure and differentiated user experience. An extensive range of services are available on a single network with an air interface latency of less than 0.5 ms and over 4 million single-cell connections. Both exceed 5G requirements specified by the International Telecommunication Union (ITU). Huawei has completed large-scale service verification based on an actual network and service environment scenario ahead of schedule. This is more than a key milestone of China's 5G R&D



test, which also indicates a significant step forward for 5G industrialization. During the test procedures, Huawei implemented interoperability tests involving radio frequency and interworking functions together with upstream and downstream vendors. Huawei partnered with instrument vendors (Rohde & Schwarz, Keysight Technologies, and DT Link Tester), chipset vendors (Spreadtrum Communications and MediaTek), and other companies to promote industry maturity. Mrs. Wang Zhiqin, Deputy Director of the IMT-2020 (5G) Promotion Group and the China Academy of Information and Communications Technology (CAICT) emphasized that, "The second-phase 5G R&D system verification was launched in September 2016 to promote global 5G standardization, accelerate 5G prototype

development, and build the 5G industry chain. This test used a set of unified equipment and test specifications for 5G-oriented typical scenarios. Thanks to proactive support from global operation, system, chipset, and instrument companies, we have reached preset goals and accelerated the formation of an industry ecosystem." Dr. Tong Wen, Huawei Fellow and Wireless Network CTO highlighted that, "Huawei launched 5G R&D as early as 2009 and since then is committed to driving technological innovation and cross-industry collaboration. Huawei's 5G research achievements have been hugely validated during the second phase of the 5G test. In the future, Huawei will continuously focus on 5G R&D to promote the sound development of the 5G industry in close participation with global partners."

ICT Energy Efficiency Discussed in Dubai

As the region's countries continue to inch closer to establishing knowledge-based economies and ICT becomes an integral part of everyday life, Dubai hosted the ICT Energy Efficiency Summit 2017, a two-day event that highlighted the latest innovations that drastically reduce energy consumption. Organized by Huawei, the Summit saw over 100 high-profile delegates representing the ICT industry in the region, including local operators Etisalat and du, as well as regional players including STC and Vodafone. The event also saw the participation of policy makers, regional authorities and industry analysts. The Summit highlighted topics include the road to smart ICT facilities, reducing operating expenditure (OPEX), solar energy applications in the ICT industry and ways to a green, connected

world. According to Huawei Network Energy Research, 40% of telecom network energy is used inefficiently, while 57% of network interruption is related to infrastructure problems. In data center, energy cost contributes 60% to its total cost of ownership in 15 years. Ponemon Institute's statistics show that an interruption could cause losses of USD740,000 annually to a data center. In addition, DC owners have to invest massive manpower into the three-shift O&M. "Energy and maintenance are two big players in OPEX of telecom operators and data centers, while solar energy remains a largely untapped source of energy for both," said Tao Hongming, President of Telecoms Energy Huawei Technologies. "We are talking about how ICT will transform other sectors in the

fourth industrial revolution, or 'digital transformation', however, the ICT industry still utilizes 'dumb' equipment that inefficiently consumes massive amount of energy" "Huawei Network Energy focuses on telecom and data center energy consumption. For example, Our Smart Site Solution increases efficiency of a telecom's site up to 95% through integrated design, high-efficiency and smart components, resulting in an increase in energy efficiency of 20% for the entire network", Tao added. The event also highlighted solutions to increasing use of solar energy, especially in remote areas, increasing use of Li-ion batteries and reducing overall O&M with smart network components.



VIVA Launches New Roaming, Voice and Internet Plans



VIVA, Kuwait's fastest-growing and most developed telecom operator, launched new innovative roaming voice and internet plans covering the GCC and Arab countries including Lebanon, in addition to many tourist destinations in the world. The new roaming plans include two voice plans, KD 5 Gulf plan for 7 days, 30 minutes of call time and 30 SMS, in addition to the KD 15 international plan for 7 days. There are also 3 internet plans that

give customers unlimited internet in the GCC, Egypt, Turkey, Iraq and Jordan for KD 5, KD 7 and KD 18. For the rest of the world, 500 MB, 1 GB and 2 GB internet plans for the same prices. Customers can benefit from add-on service for discounted rates once they consume their quota. These new plans offer postpaid, prepaid and data customers, ease and flexibility during their travels outside Kuwait to meet their roaming needs.

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Dubai, UAE

Phone: +971 4 433 5401
Fax: +971 4 429 0679
Email: marketing.meast@adlittle.com

ARTICLE

Digital Platforms and Services: Operating in the OTT Environment

Operators should partner with OTTs to differentiate and reduce churn, whereas equity investments could be undertaken for financial and strategic diversification

Over-the-top (OTT) services are considered to be online mobile applications that are typically provided by third parties through app stores and often consume significant mobile network bandwidth. With billions of users, OTT services already have huge scale and still have further growth potential. In this article, we discuss four kinds of OTT services – consumer messaging & voice, mobile gaming, video and music streaming, focusing on the impact to telecom operators and the options to address and benefit from collaborating with OTT players.

A major disruption of voice and messaging revenue is imminent for GCC telecom operators; they cannot successfully fight OTTs, but can participate in their monetization efforts. The local mobile gaming industry is nascent, but the region has potential. Telecoms can partner with gaming companies or even invest in them. In video and music streaming, global OTT players have scale and top Western content so are poised to play a significant role in the markets. At the same time local providers have a chance by capitalizing on local tastes and market knowledge. Telecoms should partner with video and music OTTs to reduce churn, whereas equity investments could be undertaken for financial and strategic reasons.

Three main OTT business models have emerged:

1. Subscription-based – the user pays a regular subscription fee (typically monthly) to gain access to the full service, usually ad-free;
2. Transaction-based – the user pays for a specific transaction only, such as viewing a movie or listening to a song;
3. Advertising-based – the user receives the service for free or at limited charges, however advertising is inserted along with the main content and/or the user's is used for marketing/advertising purposes; in addition, an ad-based model is used to attract users, some of whom might later convert to subscription-based service.

Out of these four verticals, consumer messaging & voice OTT apps attract the highest number of users – the combined users of nine of the most popular services at the end of 2016 exceeded a stunning 4.2 billion people. However, these applications have barely been monetized yet, with Tencent as the main player to meaningfully profit from its WeChat app (revenues of ~USD 1.8 billion as of early 2016). By now the messaging and voice apps are seen as an indispensable, free part of the mobile experience. As a result, revenue potential in OTT messaging and voice is mostly in advertising and, to a certain extent, transactions.



Tim Peters

Partner, Arthur D. Little



Hariprasad Pichai

Principal, Arthur D. Little



Dimitar Stefanov

Consultant, Arthur D. Little

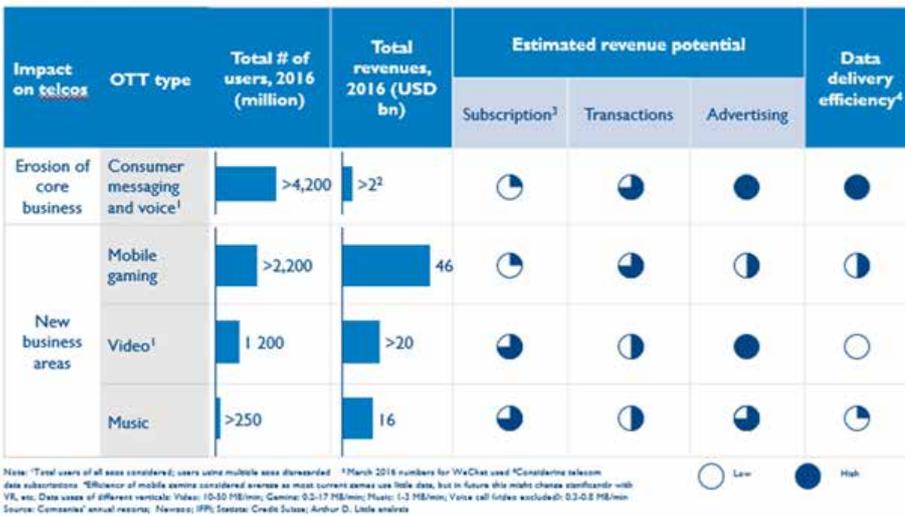


Figure 1: Estimated global size of key OTT verticals

Mobile gaming is practiced by around 2.2 billion people, and generated USD 46 billion in revenues in 2016. Historically the most popular games have utilized the freemium model, whereby gamers get free access to a game, but can buy add-ons with in-app purchases. Therefore, the revenue potential of mobile gaming is in transactions and to a certain extent in advertising.

OTT video has more than 1.2 billion users globally, and utilizes two distinct business models. On the one hand, more than 1 billion users of YouTube consume free, amateur or semi-professional content supported by advertising. On the other hand, players such as Netflix and Hulu offer premium content on a monthly subscription basis. Therefore, the revenue potential in OTT video is in both, advertising and subscription, with a more limited opportunity in transactions. Digital music streaming had 97 million paid subscribers at the end of 2016. We estimate that this corresponds to more than 250 million subscribers in total, including ad-supported usage. Therefore, we see the revenue potential for online music mainly in subscriptions and advertising, with a more limited opportunity in transactions.

Each OTT player originally began operations in a specific vertical, however there is a trend towards convergence of the verticals. For instance, music streaming players like Spotify also selectively offer videos whereas messaging players become platforms for gaming (WeChat) or video viewing (Snapchat).

In subsequent sections, we discuss the impact of OTT services on telecom operators as well as possible strategies for telecoms.

Current situation of OTT services in the GCC

The regional OTT environment is characterized by a strong representation and often dominance of global players and few local service providers with high ambitions. The GCC players are active in the verticals where the local audience's language and tastes are of high importance – in particular video, music and gaming.

Several factors influence the ability of the user to take advantage of OTT services:

- Technology availability – in the GCC mobile broadband is widely available and smartphone penetration is among the highest in the world (UAE and

Bahrain – 92%, Kuwait – 90%, Qatar – 86%, Saudi Arabia – 71%), therefore technological concerns play a limited role in the provision of OTT services;

- Content availability – in the GCC top premium content is typically available, even if sometimes delayed; at the same time some of the large OTT players such as Spotify are not available in the region, likely due to licensing issues;
- Regulatory considerations – in the GCC these affect mostly OTT messaging and voice, whereby the voice call functionality of applications is typically blocked on all networks, and some applications are restricted (e.g. Apple's FaceTime). However, maintaining a block on OTT services is not a sustainable model

Relatively muted impact of OTT on GCC telco revenues for now – the quiet before the storm?

- We believe that telecom revenues in the GCC are in for further disruption due to a full-blown revenue and EBITDA impact of OTT messaging & voice
- In this situation, telcos need to rebalance towards better data monetization and efficient operations; in addition, they can partner further with OTT providers as part of the monetization efforts

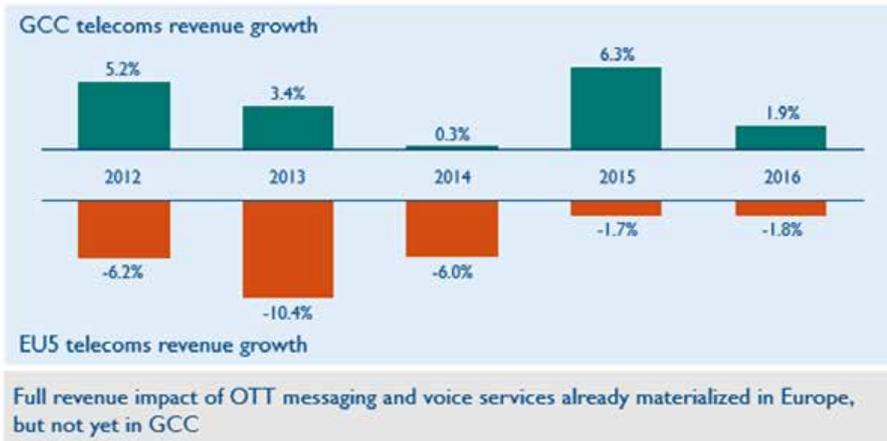
All leading global chat apps are available in the region, including WhatsApp, Facebook Messenger, Viber, Snapchat, WeChat. The high smartphone penetration in the region translates to high messaging app usage, reaching 97% WhatsApp penetration in the UAE according to some surveys. Local



Figure 2: Key global and GCC OTT players

¹ WhatsApp, Facebook Messenger, WeChat, Snapchat, Kik, Viber, Line, Telegram, KakaoTalk

² The Mobile Economy – Middle East and North Africa 2016



Note: Largest 5 EU markets considered: Germany, UK, France, Italy, Spain
Source: Operators' annual reports; Arthur D. Little analysis

Figure 4: Revenue growth for EU and GCC telecom operators, 2012-2016

messaging applications are not a viable proposition due to the strong network effects of global incumbents.

As we stated in our February 2016 report "The OTT conundrum for MENA telecoms: Achieving sustainable growth in a digital world", the benign regulatory environment supports the existing business model of GCC operators. Unlike other regions, notably Europe, OTT messaging and voice in the GCC has not disrupted telecom operator revenues as strongly as in other regions. Total GCC telecom revenues posted a cumulative increase of 18% between 2011 and 2016. At the same time total telecom revenues in the five biggest European markets declined by 24%. While there are more reasons behind this drastic drop, it is clear that substitution of paid-for calls and text messaging with free OTT services has been a driver.

At the same time, GCC telecom revenue growth slowed down significantly to 1.9% in 2016 from 6.3% in 2015. This happened across all markets, and some players plunged from growth to decline in 2016. There is no more growth potential in further market penetration. The SMS is largely irrelevant and the focus of value preservation is on voice. Average data usage is increasing but operators have been unable to increase prices accordingly; as a result, the price per GB of data is falling. In the enterprise market, unified communications apps are gaining traction. Therefore, in order to preempt a major revenue and EBITDA disruption, operators should focus on recovering

revenue by effectively bundling and monetizing data and on introduction of efficiency measures.

Messaging apps are becoming the platform for disruption, as shown by WeChat in China. In the GCC offering digital and e-commerce transactions through the apps to an underbanked population is an imminent monetization opportunity. In such a scenario, telecom operators can provide carrier billing and take a slice of the revenue pie.

Gaming – an untapped differentiator?

- Local gaming companies are facing a relatively untapped market
- Telcos can partner with game producers in order to enhance their own value proposition vis-à-vis youth segments; in addition, they can make equity investments in an immature market with good potential

Established global players dominate the gaming market. These include traditional video game publishers that have entered the mobile space such as Electronic Arts, Take-Two Interactive and Activision Blizzard, as well as 'native' mobile game developers such as Netmarble and Supercell. Some initial attempts are made to establish a local video game industry. Companies such as Falafel Games, Wixel Studios, Game Power 7 and Quirkat develop and publish games; however, for the time being there are no significant local content players.

The overall MENA gaming market is quite small, estimated at less than 2%

of the global market. At the same time, significant segments of the GCC's young, tech-savvy population have a passion for gaming. In Saudi Arabia, surveys show that 25% of gamers play for three or more hours per day, and 13% of gamers spend SAR 500 or more on gaming – the so-called 'whales' that spend a disproportionately high amount of time and money on gaming. Furthermore, gaming is a creative area that allows for content localization according to local tastes, which is currently lacking. The local players are used to playing the leading global games and there is no significant local gaming production with content relevant for the region beyond language localization.

Some initial efforts have started, with regional-focused gaming developers and publishers appearing in Lebanon, Jordan and UAE. Regional venture capital firms such as Middle East Venture Partners and twofour54 have invested in several gaming startups across the region – Falafel Games, Jawaker, Unnyhog.

Partnerships between the gaming startups and telecom operators have win-win potential. The operators' distribution network and customer base can be give a powerful boost to the region's nascent gaming industry. For telecoms, carrier billing partnerships or gaming-themed bundles can be an opportunity to differentiate. Zero-rating of e-sports viewing, for instance a Twitch package, can also separate an operator by the pack. Finally, equity investments in gaming can provide both financial and strategic return.

GCC telecom revenue growth slowed down significantly to 1.9% in 2016 from 6.3% in 2015. This happened across all markets, and some players plunged from growth to decline in 2016. There is no more growth potential in further market penetration.

In video, content is king; is Arabic content worthy of the throne?

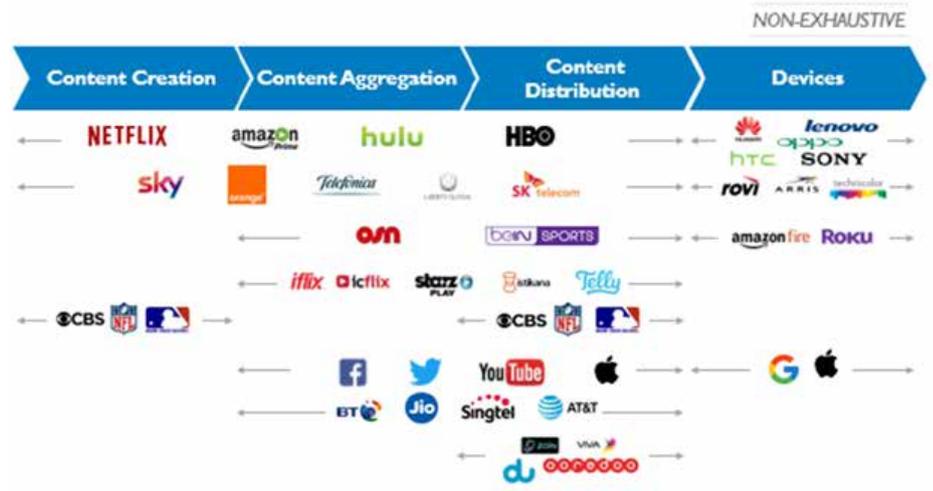
- We expect that Netflix will become a strong – if not dominant - player in the region on the back of its improved content
- Telcos can partner with Netflix or the local players to enhance their value proposition and reduce churn

The GCC region historically has been a huge consumer of free OTT video, in particular YouTube. This involves typically amateur or semi-professional content. The global leader in premium, professional content – Netflix, launched in the region in 2016, along with Amazon Prime Video. In addition, several local players compete in the space, counting on Arabic content as a key differentiator – icflix, Starz Play, Istikana, Telly. In addition, in May 2017 the South East Asian provider Iflix entered the region with a launch in Kuwait and Bahrain.

In the OTT universe, video represents the most complex value chain, with multiple players both cooperating and competing at different parts of the value chain as shown in Figure 3.

Telecom operators participate in the value chain by aggregating and distributing content, and more recently also by engaging in content creation. Locally, players only aggregate and distribute content, typically as a complement to their IPTV platform.

We believe that having the most relevant content is key to winning in OTT video and Netflix has a strong chance of ultimately



Source: Arthur D. Little analysis

Figure 3: OTT video value chain

leading in the GCC markets. The company started 18 months ago with a relatively small catalogue with no Arabic subtitles and without its top shows, but has made significant strides over the past 18 months. It launched its own blockbuster shows ('House of Cards,' 'Orange Is the New Black'), added Arabic subtitles to all content and Arabic dubbing to some of the children's content. Netflix boasts the largest non-Arabic library in the region, with 2.5 – 7 times the content of regional players, and is particularly strong in TV shows - a prime area of the company's own content investment. The app offers excellent user experience and functionalities including ability to download and watch offline. Therefore, Netflix is currently poised to win the content game, especially if it manages to increase its Arabic offering – potentially by creating its own Arabic content as it has done in other non-English markets, or alternatively by partnering.

However, for the time being the local players are significantly stronger in their Arabic content offering, which will be important for some segments of the population. icflix is by far the strongest winner to emerge from the Arabic content plays, which might be a runner-up in the region.

For telecom operators, the OTT video services represent a partnership opportunity through which to increase the attractiveness of their data bundles, and thereby potentially decrease churn.

Starz Play is an interesting case focusing more on quality than on quantity, with top blockbuster movies and exclusive content. At the same time we consider its content proposition somewhat inferior to Netflix's in Western content but not comparable to the local players in terms of Arabic content.

For telecom operators, the OTT video services represent a partnership opportunity through which to increase the attractiveness of their data bundles, and thereby potentially decrease churn.

	Netflix	Amazon Prime Video	Starz Play	icflix	Istikana	Telly
Arabic shows (#)	2	-	17	165	99	~70
Arabic movies (#)	3	-		~1,200	132	46
Non-Arabic ¹ shows (#)	~290	~106	102	22	-	14
Non-Arabic movies (#)	~2,500	~2,350	506	900	-	~370
Children's content ² (#)	144	100	100	58	14	13
Monthly subscription fee (USD)	7.99-11.99	5.99 ³	7.99	7.99	0.27/day	4.99
Telecom partners						
Other partners						

Source: Arthur D. Little analysis
 Note: ¹ Non-Arabic content includes Hollywood as well as non-Hollywood content – French, Indian, etc. ² Movies and shows combined. ³ USD 2.99 for the first 6 months

Figure 6: Available content on key OTT video services available in the GCC markets, May 2017

To scale wins – is there room for a GCC OTT video giant?

- We believe that OTT video will consolidate in the region and there is room for a strong local player
- Telcos can play a role in the process, by making selective equity investments in video OTT players

Given the fixed investment in content rights (and in some cases – content creation), strong economies of scale exist in video streaming. Therefore, we expect that over time the number of players on the GCC market will decrease and consolidation will happen. This will be aided by the data-driven nature of the industry – the more data on the viewing habits a player has, the better known the viewers' habits are and the easier it is to recommend – or create - the right content. Netflix has utilized this virtuous cycle with great success, which results in increased subscriber stickiness and, in the case of hit shows, new subscriber acquisition.

To make things even more complicated for the regional players, the available research has shown that local audiences have relatively higher willingness to pay for high-quality Western content. At the same time, the willingness to pay for Arabic content is relatively lower, as this content is often available on free-to-air television. This makes partnerships especially important as a distribution channel. Therefore, all of the regional OTT video players have engaged in some form of partnership activity – with both telecom operators and other vendors, as shown in Figure 6.

In order to succeed in attracting paying customers beyond the free trials, OTT players might need to introduce lower-priced packages, potentially with a more limited offering. Telecoms can play a role in the future direction of the vertical by making equity investments in OTT video players, thereby potentially combining strategic with financial objectives. This is a path that has been taken for instance by Singtel in South-East Asia through its investment in Hooq.

Music is still up for grabs – is there money to be made?

- One local player has emerged as a frontrunner and stands a chance in the absence of some of the global giants
- Telcos can partner with music streaming players to enhance their value proposition and reduce churn, or even make investments in them

In music, several of the major global players have not yet entered the region – notably Spotify, but also Google Play Music, Amazon Music Unlimited and Tidal. The main reason is content rights acquisition, even though limited financial resources, piracy and low credit card

GCC telcos are faced with significant core revenue disruption by OTT voice players. To counter this, operators need to strengthen their data monetization capabilities, make their operations more efficient and develop partnering skills. At the same time OTT services themselves have a long way to go until market maturity and full monetization.

penetration also play a role in the relative attractiveness of a market. Out of the global players, Deezer and Apple Music are present, and they are competing with the local service Anghami.

Similar to the dynamics in video streaming, Anghami uses Arabic content as its key differentiator, with extensive Arabic music selection, Arabic search functionality and multiple filters for various Arabic content. Anghami receives strong media exposure through some of the region's most successful TV shows such as Arab Idol, Coke Studio and The Voice. Furthermore, the company has a partnership with du in the UAE as well

as with Huawei for easy activation of ring-back tones on Huawei devices. As a result, Anghami claims 33 million listeners across the MENA region.

However, even globally the music streaming industry has still not reached maturity – and its business model has not been proven. For streaming players, partnerships and a variety of pricing models will be equally critical to increase reach and foster conversion of free to paid users. For telecoms, partnering is an opportunity to enhance their value proposition, while investment can bring financial return, especially as the industry consolidates.

Conclusion

GCC telcos are faced with significant core revenue disruption by OTT voice players. To counter this, operators need to strengthen their data monetization capabilities, make their operations more efficient and develop partnering skills. At the same time OTT services themselves have a long way to go until market maturity and full monetization. The verticals are not mature even globally, and in the GCC they face an additional set of challenges, including free content availability, piracy issues, and limited willingness to pay. Telecom operators in the region can play an indispensable role in scaling the OTT services by:

- Selectively embracing OTT messaging and voice providers in their monetization efforts – and taking a cut in the process
- Partnering with local mobile game producers, global or local video players, or music streaming players, thereby enhancing their own value proposition and reducing churn
- Making selective equity investments in OTT players for financial and strategic reasons, playing a role in the consolidation of these industries. 📌



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REGIONAL NEWS

Middle East Firms Tap Advanced IT Systems for Digital Readiness

There has been a steady increase in the demand for converged and hyper converged infrastructure across almost all verticals in organizations in the region, experts have said. According to a recent study by Dell EMC, 98 per cent of businesses in the UAE currently leverage convergence to ensure digital readiness. In addition, 60 per cent of respondents show a highly positive sentiment towards the adoption of these advanced systems

in response to achieving IT agility, which is central to meeting the demands of digital business, 70 per cent of respondents feel that converged and hyper converged infrastructure support their overall IT transformation strategy. In view of this, nearly two-thirds of the respondents state convergence to be an important, long-term aspect of their overall IT approach. On the same note, with 74 per cent and 80 per cent of respondents likely to

adopt technology that increases business agility and responsiveness to deliver faster outcomes and allow IT teams to enable innovation," Said Akar, vice president, EMEA - converged platforms and solutions division, Dell EMC. However, most respondents surveyed also cite concerns over adoption of converged and hyper converged infrastructure, with 66 per cent of respondents stating data protection and privacy to be their greatest concern. In addition, 56 per cent of respondents feel investment cost for convergence acts as a major barrier. Many experts have also noted the importance of security given that investments in financial technology (FinTech) in the Middle East are set to grow by more than 250 per cent. Recent research by Wamda Research Lab (WRL) and Payfort has found that FinTech startups in the Mena region have raised over \$100 million in funding in the last 10 years, and a new report indicates the number of startups launched and investments raised will more than double by 2020. The 'State of Fintech' report says that startups aim to raise \$50 million in funding this year, a 270 per cent increase on the \$18 million in disclosed investments last year. Furthermore, while 105 FinTech startups had launched in the region by the start of 2016, the report estimates this will rise to 250 by 2020. Half offer some form of payment solution and a third are involved in money lending and capital raising.



and state strong understanding of the benefits offered by converged and hyper converged infrastructure. "With the digital revolution altering the way every business operates, it is important for organizations to view IT transformation initiatives as a key factor to gain market differentiation," said Fady Richmany, senior director and general manager, UAE region, Dell EMC. In

invest in converged and hyper converged infrastructure respectively this year, it makes it evident that there is heightened demand for convergence among regional businesses. "In this dynamic digital economy, a strong IT backbone is key not only to ensure business sustainability but digital readiness as well. However, this paradigm shift dictates that organizations

Bahrain Set to Launch National e-Wallet

The Benefit Company has joined forces with Lebanese group FOO technologies to launch the National Mobile Electronic Wallet (BenefitPay), an e-payment software designed to streamline payment within Bahrain. The national e-wallet is a joint initiative of the Central Bank of Bahrain (CBB) and Benefit. It will enable instant payments via smartphones and also facilitate the collection of payments electronically through debit, credit and prepaid cards and online bank accounts, for online and in-store purchases.



MENA Digital Transformation Market Likely to Grow

Future Market Insights (FMI), with sharp focus on emerging regions, delivers key insights on the Middle East and North Africa (MENA) digital transformation market in its recent report titled "Digital Transformation Market: MENA Industry Analysis and Opportunity Assessment 2014 – 2020". The MENA IT market is anticipated to grow at a single-digit CAGR during the forecast period. In contrast, the MENA digital transformation market is expected to expand at a CAGR of 15.1% from 2014 to 2020. The contribution of the MENA digital transformation market to the overall MENA IT market is likely to increase from 10% to 16% by 2020, witnessing an increase of 600 BPS. Growth of the MENA digital transformation market is mainly driven by increasing need for enhanced customer experience at all levels of customer interaction points and improvised process transparency in enterprises across the countries in this region. Moreover, countries such as the UAE, Saudi Arabia and Lebanon are increasingly introducing e-Government and smart city initiatives, with the objective to transform themselves into digitally-enabled countries. This is further supporting growth of the MENA digital transformation market. Summing up drivers behind growth of the market, FMI analyst Vineet Kumar sheds light on why digital transformation will become mainstream technology in MENA in the near future. "Digital transformation across all verticals has become increasingly relevant due to increasing emphasis on enterprise mobility and smart technology enablement. Furthermore, digital transformation technologies are transforming organization's business models, value chains, ecosystem as well as revolutionizing interactions with customer through online platforms, social media and mobile devices", he said. This report covers two types of

digital transformation offering, namely digital services and digital software. Digital services accounted for over half of the MENA digital transformation market share in 2014; however, this is expected to decrease by 70 BPS by 2020. "Growing Internet penetration and social media usage in the Middle East and North Africa is expected to drive the demand for digitalization of software and services at a double digit CAGR between 2014 and 2020", Vineet Kumar said while commenting on the increasing deployment of advanced technologies in small/medium sized businesses across MENA region. This report also covers the 10 types of end-user verticals in the MENA digital transformation market. Among the end-user verticals, banking, financial services and insurance (BFSI) and public sectors dominated with over 40% share of the MENA digital transformation market in 2013. Service, retail, energy and utility sectors are the other major sub-segments among the end-user verticals. However, the media & entertainment sector is anticipated to exhibit the fastest CAGR of 17.2% during the forecast period, followed by the retail sector. This growth is attributed to the shift from print to digital media, increasing penetration of smartphones

and changing consumer buying habits. Ongoing infrastructural modernization across major GCC and North African countries in MENA region in terms of digitization is increasing the acceptance of digital software and digital services; not only by large- and medium-, but also by small-sized enterprises. Currently, Saudi Arabia is dominating the market with over 30% share of the overall MENA digital transformation market, followed by the UAE and Algeria, which account for over 10% share each. However, among all the GCC countries, the digital transformation market in Qatar is expected to grow at a significant double-digit CAGR over the forecast period. Key players in the MENA digital transformation market continue to innovate by including advanced features into digital technology solutions. Additionally, major participants such as IBM, Accenture and Deloitte have been focusing on mergers and acquisitions at a global level in order to expand their geographical presence and enhance customer base. Advanced technology adoption, changing consumer buying pattern and product innovation are some of the trends in MENA region. Presence of cloud computing, big data analytics and enterprise mobility is gradually gaining traction in MENA region.



PTCL Launches 4G in Azad Jammu and Kashmir

The Azad Jammu and Kashmir (AJK) government on Wednesday launched 4G service of Pakistan Telecommunication Company Limited (PTCL) to provide fastest telecommunication to people. Prime Minister AJK Raja Farooq Haider

Khan formally launched the service at a function in Muzaffarabad. Speaking on the occasion, he stressed the need for spreading internet services in educational institution across Azad Kashmir. Raja Farooq Haider said, "Overseas Kashmiris

depend on internet for coordination with their families." He hoped that 4G service will bring a revolution in telecom sector in the state. On the occasion, the salient features of 4G service were also presented.

Mobile Net Usage Increasing Since Launch of 4.5G in Turkey

Mobile internet usage in Turkey skyrocketed when advanced fourth-generation (4G) telecom services -- dubbed 4.5G in Turkey -- became available, said Transport, Maritime Affairs and Communication Minister on Wednesday. "People whose devices or sim cards are compatible with 4.5G service use more than 5.5 gigabytes in monthly Internet use," Ahmet Arslan told Anadolu Agency about the Information and Communication Technologies Authority (BTK) report for the first quarter

of 2017. Arslan stated that Turkey had 11 million fixed phone subscribers at the end of 2016, compared to 75.7 million mobile subscribers, commenting: "In short, 94.9 percent of our population are mobile subscribers" Arslan added that Turkey tops European countries in the duration of monthly mobile usage, as Turkey's average was 413 minutes in the first three months of 2017. Arslan said that since becoming available last April, 4.5G services have grown more popular in Turkey. "One year later almost 56.4

million Turkish citizens have become 4.5G service subscribers," Arslan said, adding that only 22 million people were able to use this service through the end of March since their device or sim card was not compatible with 4.5G. Arslan said that the communication sector reaped 45.4 billion Turkish liras (\$12.9 billion) in sales revenue in 2016 and 12 billion Turkish liras (\$3.4 billion) in the first three months of 2017. Arslan also said that that high-speed fiber Internet is also growing impressively. The length of fiber infrastructure grew 9.2 percent over the last year to reach 297,620 kilometers (184,932 miles) by the end of March 2017. Fiber subscribers in the country now exceed 2 million, he said. Turkey's mobile network progressed to 4.5G in April 2016, which is 10 times faster than 3G technology, said the Information and Communication Technologies Authority head. "4.5G is 10 times faster than 3G technology," Omer Fatih Sayan said. According to the authority, 4.5G technology offers consumers the ability to use new technologies and provides faster browsing, downloads, and uploads.



Telecom Firms Set to Invest Heavily in Infrastructure in Pakistan

President Pakistan Businessmen and Intellectuals Forum (PBIF), Mian Zahid Hussain lauded the government for announcing steps in the budget which will expand IT sector. He said decisions would attract local and foreign investment, expand GDP and result in job opportunities. Mian Zahid Hussain said that many Pakistani companies had done very well locally and on the international level while giving tax exemption to the new companies for three years which would result in expansion. He said that decision to establish IT park in Islamabad at a cost of six billion rupees and allocation of twenty billion rupees for laptop and youth programme were laudable moves. Allocation of Rs 200 million for e-gateway would strengthen mobile banking, upgrade skills of IT

professionals and boost SMEs working in this field, he added. The business leader said that IT companies working in Islamabad had been exempted from sales tax on exports which was a good move but the same facility should be extended to the companies operating in Lahore

and Karachi. Moreover, the provincial governments should also consider giving relaxations to this sector, he demanded. Reduction in duty on telecom equipment would trigger up gradation while reduction of WHT on mobile calls was also a good move, he added.



MoIT Seeks Federal Cabinet's Approval to Roll Out 5G Services in Pakistan

In order to successfully launch the evolutionary technology 5G in Pakistan, the Ministry of Information and Technology (MoIT) sought an approval from the Federal Cabinet to roll out 5G. MoIT seeks Federal Cabinet's Approval to Roll Out 5G Services in Pakistan. This indicates the Government of Pakistan (GoP) commitment towards improving the mobile broadband services in the country as the launch will further increase the speed of internet connectivity in Pakistan. If the cabinet division approves this proposal, it will allow for the market test of latest and advanced technologies including 5G and some other mobile communications. This will make Pakistan one of the first countries to test, trial and then successfully launch the 5G mobile technology. The draft proposal includes policy directives for the Pakistan Telecommunication Authority (PTA) and Frequency Allocation Board (FAB), which will identify appropriate bandwidth in the frequency spectrum blocks currently under consideration for 5G. A new regulatory framework will also be issued to govern the new

technology. "The ministry has stayed committed to accelerated digitization through proliferation of broadband and particularly mobile broadband. State Minister for IT Anusha Rahman said this while releasing the policy directive for consideration. This will make Pakistan one of the first countries to test, trial and then successfully launch the 5G mobile technology. Anusha Rahman also said: "Keeping the focus we shall ensure that Pakistani nation stays at the cutting edge of technology and the policy directive is meant to ensure and showcase the continued commitment. Worldwide, 5G technology is under the research & development phase and it is expected to be standardized by the International Telecommunication Union Radio communication sector in 2019. The IT Ministry's proposal further said that: "Testing entities will be allowed access to such frequency blocks for testing purposes only. PTA will roll out such test trial facility for the new technologies through a regulatory framework to be issued in line with the Telecom Policy 2015 for temporary test and development licenses/authorizations within three months." The regulatory framework will include:

- Criteria for the provision of the test licenses
- Conditions
- Duration and other terms and conditions of reissuing the test licenses on expiry

For this reason, PTA has been assigned the task to engage all the concerned parties such as telecom operators, equipment manufacturers and R&D institutes for the successful execution of 5G trials. It is expected that 5G will be a big catalyst in transforming and taking the Pakistani IT and Telecom sector to a next level. This will further benefit the national exchequer of Pakistan and overall masses of general public.



Batelco Launches Commercial VoLTE Offering

Bahrain Telecommunications Company (Batelco) has announced the launch of voice-over-LTE (VoLTE) services, claiming a first for Bahrain. In a press release confirming the development, Batelco said that the service, which it has reportedly rolled out 'across the Kingdom', is initially available to customers with Apple's iPhone 6 handset or a newer model; the device manufacturer is currently sending software updates to all compatible iPhone users in the Kingdom to enable VoLTE connectivity. Meanwhile, Batelco has also confirmed that there will be no additional charge for VoLTE, as users with a compatible device and tariff will be automatically upgraded. Commenting on the development, Batelco Bahrain chief

executive Muna Al Hashemi was cited as saying: 'It is our pleasure to announce the launch of the [VoLTE] service with Apple for our iPhone users in the Kingdom

of Bahrain. Batelco aims at improving and guaranteeing the best customer experience by providing the latest innovative technologies to its customers.'



Batelco and Tata Communications Sign Agreement

Manama, Bahrain: Batelco, Bahrain's leading digital communications solutions provider and Tata Communications, a leading provider of A New World of Communications™, have signed an agreement further strengthening their partnership to extend the reach of their global data center, cloud and connectivity solutions to their customers. Batelco has chosen Tata Communications as a cloud partner to ensure high levels of flexibility and reliability for its customers through Tata Communications' IZO™ Cloud Enablement Platform. The agreement was signed by Batelco Chief Global Business Officer Adel Al-Daylami and Tata Communications' Senior Vice President for Middle East, Central Asia and Africa Radwan Moussalli, on the side-lines of International Telecoms Week (ITW) which took place in Chicago, USA from May 14 to 17. Speaking following the event, Batelco Bahrain CEO Eng. Muna Al Hashemi said that forming strategic partnerships with world leading organizations such as Tata Communications is an important pillar of Batelco's global expansion plans and crucial in supporting Batelco's trusted and resilient networks. "Our global expansion strategy is designed to strengthen our global portfolio of services by ensuring the provision of reliable solutions both into and from Bahrain." she said. Mr. Al-Daylami said that Batelco was very pleased to build on its established partnership with Tata Communications and extend Batelco's international reach and diversity. "The new agreement is also beneficial in supporting Tata Communications' requirements for reliable connectivity in the Middle East region as part of the

company's IZO™ Internet WAN service." "Batelco is pleased to be the partner of choice for global players such as Tata Communications, empowering their global networks through the provision of reliable and resilient solution" added Mr. Al-Daylami. Tata Communications' game-changing IZO™ Cloud Enablement Platform empowers enterprises to connect and build their cloud, their way – be it private, public or hybrid. It is supported by Tata Communications' leading global infrastructure. Today, over 25% of the world's internet routes travel over the company's network, which is the largest

East a gateway to international markets. Tata Communications' pioneering IZO™ Cloud Enablement Platform, and in particular IZO™ Internet WAN, harnesses our partnerships, global network and cloud expertise to make the Internet fit for business and help Batelco's customers accelerate their digital transformation. Batelco continues to be a trusted partner of choice for us as we work together to support enterprises in the region and globally on their digital transformation journey." Batelco annually attends International Telecoms Week which is a key meeting point for the global wholesale



wholly-owned subsea cable network in the world. The agreement allows Tata communications to extend its data center footprint in locations like Bahrain, Jordan, among others enabled by Batelco. This allows Tata Communications' customers to have a one stop, seamless solution for their network, cloud and colocation requirements. Mr. Moussalli, said, "Our partnership with Batelco strengthens our commitment to providing the Middle

telecommunications community. The event annually attracts over 5000 delegates from thousands of companies representing 150+ countries to meet and buy/sell voice and data products and services. Batelco's service provisioning extends far beyond the shores of Bahrain; the company's global positioning ensures that Batelco is capable of offering world-class services to international customers.

Nepal-China Cross-Border Fiber Network Set to be Started in June

The cross-border optical fiber network between Nepal and China established a year ago may come into operation from the first week of June, said Nepal Telecom Saturday, the state-owned telecom giant of Nepal. The connectivity established for the first time between the two neighbors through Geelong-Rasuwgadhi border point, has ended Nepal's sole dependence on India for connecting the Himalayan country with global telecom and internet services. Nepal Telecom (NT)

and China Telecom Corporation Limited had established the connectivity in June last year but operation was delayed due to landslide in China damaging the underground optical fibers. "China Telecom has informed us that they are completing the repairing and rerouting of damaged optical fiber within May," Sovan Adhikari, joint spokesperson of NT told Xinhua on Saturday. "We have been in constant communication with the Chinese company." Following the connection with

Chinese optical fiber, Nepal will be able to purchase internet bandwidth with Chinese companies. "This will create a competitive environment for purchasing internet services which could reduce cost of internet service here," said Adhikari. Meanwhile, the NT said it has signed initial memorandum of understanding with China Unicom, another Chinese telecom operator, for further cross-border optical fiber connectivity.

PTA, MoIT & Qualcomm Hold Workshop on 5G Technology

Pakistan Telecommunication Authority (PTA) and Ministry of IT, IT and Telecom Division in collaboration with Qualcomm Pakistan organized a one day workshop on Technology Evolution & Roadmap to 5G at Local Hotel, Islamabad. Senior Officers from PTA, Frequency Allocation Board (FAB) and Ministry of Information Technology attended the workshop. PTA, MoIT & Qualcomm Organizes Workshop on Technology Evolution & Roadmap to 5G. The workshop was arranged so that practical steps, in line with the vision of the Government of Pakistan to introduce the latest technologies in Pakistan, can be taken and to specifically discuss the technology Evolution & Roadmap to 5G. Mr. Khalid Barghouti was the main expert who conducted the workshop. The session covered the underlying technology of 5G, its evolution phases and the tests, trails and development in various countries. Speaking on the occasion, Chairman PTA, Dr. Syed Ismail Shah said that: "The government has always encouraged new ideas and support initiatives for the use of technology for the betterment of the citizens. In this regard the Government would facilitate all existing as well as new companies to test 5G in Pakistan. The facilitation would be in the form of free test license and spectrum. One of the harmonized spectrum for 5G is in the 3.5 GHz band and one of the first use case is the Wireless to the home/office (WTTx) service." He also added that: "There is spectrum available in this band in Pakistan and an EoI would be floated at a suitable time to gauge interest in conducting a trial before the standard is finalized in the year 2020. It may be noted that Minister of State for IT Ms. Anusha Rehman Khan has on several occasions stated that Pakistan would be among the First few countries in South Asia to have 5G services." Dr. Shah also mentioned that PTA and MoIT are



working on several fronts to increase the access of broadband technologies to far flung areas of Pakistan and to improve the Quality of Service and Quality of Experience while keeping pace with the modern technologies. It may be noted that just 3 years ago Pakistan was without Mobile Broadband Services and was even behind all our neighboring countries. Everyone present appreciated the team work of PTA, FAB, MoIT, the Telecom operators of Pakistan and most importantly the citizens of Pakistan for being supportive. It was common view that it is only through joint efforts that we can succeed. Regarding 5G and broadband technologies, it was noted that some countries have even declared access to broadband as a basic human right. It was emphasized that all the citizens of the country should use Internet for Positive activities like learning, financial inclusion and entrepreneurship and avoid activities that can harm others or waste time.

Telecom Sector Grows in FY 2016-17 in Pakistan

Telecom sector has shown positive growth during the first two quarters of FY 2016-17 as the total teledensity reached 72.36 percent at the end of March, 2017. This was as compared to 70.81 percent at the end of last fiscal year due to growth in cellular mobile subscribers, according to survey report. Revenues from telecom sector reached an estimated Rs. 234.9 billion during the first two quarters of Financial Year 2016-17, an official data said. The overall revenues of telecom sector were likely to match or show

growth in the full financial year compared with the last year. According to available statistics, revenues of the telecom sector stood at Rs. 454.4 billion in the full financial year of 2015-16. Doubling the figures to compare on a yearly basis, the revenues of the telecom sector will be settled at Rs. 469.8 billion for 2016-17, which is 3.3 percent or Rs. 15.4 billion higher than previous year. However, it seems growth in revenues of telecom sector can be considered an ambitious target. Revenues are likely to either

match the level of previous year or record slight growth in the current financial year 2016-17. Economic Survey of Pakistan data said that the commercial launch of 3G and 4G LTE services has opened new opportunities for revenue generation for the mobile operators. Availability of 3G and 4G services has enabled development of new applications and data based services, and the people of Pakistan are quickly adapting to these new technologies and services.

Telecom Egypt Signs Mobile Network Deal with Etisalat

Telecom Egypt (TE) announced a five-year agreement to use the network of Etisalat Misr to start providing mobile services. The national roaming with Etisalat covers 2G, 3G and 4G mobile

services as well as international voice services. Telecom Egypt was awarded a mobile operator license last year. It's also signed a roaming agreement with Orange Egypt. TE is expected to start offering

mobile services from September. ax on cash withdrawal by branchless banking agents would be eliminated.

UAE All Set For Mass Adoption of 5G

The mass adoption of 5G in the UAE will completely transform the landscape when it comes to how residents utilize their various connected devices, and further strengthen the Internet of Things (IoT) trend in the region. Experts have noted that in addition to delivering faster Internet connection speeds and improved throughputs, 5G delivers higher user capacity than current 4G networks enabling more mobile broadband users per area and virtually unlimited data consumption. Users will be able to stream high-definition media many more hours per day with their mobile devices, and if Wi-Fi hotspots are out of reach, 5G will deliver improved device-to-device communication support, lower latency and less battery consumption than 4G platforms. Marwan bin Shakar, vice-president of access and transport planning at du, said that 5G will completely change



the connectivity experience by enabling all entities and players to transfer information instantaneously. "5G is targeting three main areas: record speed, ultra-reliable low-latency connectivity, and massive capacity. 5G marks a paradigm shift of mobile industry from connectivity as a service to 5G network slice as a service. The concept of network slicing is what makes the 5G networks capable of delivering such tough and diverse targets. In 2015, we successfully contributed to the ITU Study Group on 5G and we are on

course to offer this technology platform to the general public by 2020," Bin Shakar told Khaleej Times. Jeroen Schlosser, managing director of Equinix Mena, says that the growing penetration of smartphones, extended network coverage, and increased demand for data services has accelerated the demand for 5G in the region. "5G network will not only provide great internet speeds, but will help facilitate the use of smart vehicles, transport and infrastructure as well as allow for the control of remote devices. With UAE having the highest level of smart phone penetration at 73.8 per cent, 5G will definitely be the next-big-thing here in the region," he said. Telecoms across the UAE have eagerly accepted that there is a unique opportunity for them to provide the network and roadmap for 5G opportunities, and facilitate technology adoption across various industries. In its latest report, Ericsson notes that UAE telecom operators who address industry digitalization, can expect a revenue potential of \$3.1 billion by 2026. Bin Shakar explained that there is no "Big Bang" in 5G, but rather incremental milestones that take us step by step towards the future 5G Network. "Du is taking many necessary steps towards the future 5G network which include the LTE-Evolution, Cloud RAN, Mobile Edge Computing and finally the future 5G New Radio. In this regard, we have established UAE 5G Innovation Gate (U5GIG) to push the boundaries of what is possible now and in the future, while at the same time actively participating in 5G development." An important thing to note, experts say, is that 5G will make even more room for all the Internet-connected devices in our day-to-day life. Christopher Bergey, vice-president of embedded and integrated solutions at Western Digital, said that though smartphones are the most connected devices that we use which relate

to 5G, it is actually more about connecting to other Internet devices with sensors. "5G will go well beyond smartphones and into computing devices that are embedded into everyday objects enabling them to capture, send and receive data. The Internet of Things technology market is expected to grow from over \$130 billion in revenue to more than \$883 billion at a CAGR of 32.4 per cent between 2016 and 2022, and covers hardware, platforms, software solutions and services that will create a host of derivative 5G products with enhanced storage capabilities," he said. Schlosser said that retail and industrial will be the first industries to take advantage of IoT, as a key consequence of the 5G. "Retail, with increasing mobile wireless products such as smartphones, wearables and home assistants, and the supply chain logistics that bring them to market, is leveraging the IoT to gain valuable customer insights, introduce new products and ensure customer satisfaction. And the industrial industry, with its connected turbine engines, power plants and vehicles, leverages the IoT to ensure greater efficiencies and safety in the production, running and maintenance of these things." He believes that health-care and financial services are up next, once these industries can better ensure the needed levels of privacy and security. "In order to prepare for the 5G revolution and the IoT trend it will bring about, companies require close collaboration, investment and innovation from network and mobile providers, who are building all the new connections to these new IoT devices. IoT platforms will need to build the storage capacity and ability to crunch all the data coming from those devices that is required to get the real-time insights companies need to make the right business decisions."

Zain Bahrain 5G launch planned for end-2018

Bahrain's second largest cellco by subscribers, Zain Bahrain, has announced its intention to commercially launch a 5G network at the end of 2018, according to the Bahrain Bourse, which cites an article in local news outlet AlAyam. The news comes after the country's leading mobile

operator Bahrain Telecommunications Company (Batelco) recently announced that it had conducted Bahrain's first 5G trial with Swedish technology provider Ericsson. No details have yet been provided by Zain as to who it will partner with in order to offer 5G services next

year. According to TeleGeography's GlobalComms Database, Zain Bahrain launched its 4G LTE mobile network in April 2013 and had 99.95% coverage at the end of 2016.

Mobily Business Collaborates With Microsoft to Provide Cloud Computing Services for Small Medium Enterprises

Mobily Business signed an agreement with Microsoft Arabia to provide and present Microsoft cloud services and productivity tools through the internet like; Office 365, Dynamics, Enterprise Security Suite, to fulfill the needs of Small Medium Enterprises in the Saudi market. The agreement was signed in the presence of Eng. Ismail Alghamdi, Mobily Chief Business Officer, and Eng. Sameer Noman, CEO of Microsoft Arabia. This agreement reflects Mobily Business

Business Sector on top of which small & medium enterprises. It also confirms Mobily's efforts to enhance this sector by providing Microsoft cloud services. Moreover; we are proud of our successful partnership with Microsoft during previous years and looking forward to complete this partnership in the future." Mobily Business and Microsoft Arabia have a strategic partnership for a long time where Mobily established a strong presence in the local market through it, and this joint collaboration is a vivid example of Mobily partnerships in order to develop provided services to consumers and business sector in the Kingdom. Eng. Sameer Noman, Microsoft Arabia CEO, said, "we are happy to sign this agreement with Mobily Business, which will enable

Microsoft cloud solutions facilitate productivity "Office 365" for SME by achieving their tasks quickly and in a smart way against a monthly subscription fees starts from 16 SR including support that will be added to the monthly service bill. Users can exchange documents in a secure way, and access their computers that are working on "Windows 10" or smart phones from any other operating system, whether they are working on office applications or even Personal Computers "Office 365" that depend on cloud computing technologies by Microsoft. The agreement aims to raise the level of joint technical collaboration between both sides and provide Microsoft cloud for SME. Moreover, Microsoft is committed to develop the skills of workers in these establishments to transfer them into a paper free environment by using Microsoft Cloud Solutions. It is worth mentioning that Mobily Business provide flexibility and reliability where the company owns 48 data centers, and provide through them a space for establishments to put their servers and network devices in a reliable way all around the Kingdom. Moreover; Mobily data centers under category 3 and 4 are accredited by (Uptime Institute) and provide several levels of security measures to devices and network, in addition to full power redundancy in all centers and faster network connection.



efforts towards developing and enhancing Business sector services by combining existing services with Microsoft cloud products to support customers efficiently. Eng. Ismail Alghamdi, Mobily Chief Business Officer, said, "we are pleased to sign this agreement with Microsoft which confirms Mobily's leading role in

Mobily to provide Microsoft solutions that enhance productivity, efficiency, and security of SME (Small Medium Enterprises). This partnership is part of our commitment to enable individuals and establishments to achieve more especially in this time which depends on cloud computing as an infrastructure."

Pakistan all set to introduce e-payment gateway

In a bid to promote electronic payments in the country, Government of Pakistan has decided to open its own e-payment gateway. The news came in when there is solid evidence that international e-payment gateways such as Alipay, Paypal are likely coming to Pakistan. According to the Minister, "State Bank

of Pakistan is going to develop state of the art e-gateway at the cost of Rs 200 million". It turns out that government is eagerly pursuing its dream of Digital Pakistan by introducing such projects. ICT consultant, Parvez Iftikhar said, "Digitalising Pakistan is the way forward. This is how we will cope up with the developed countries". He further said, "The system will facilitate transactions through mobile banking. The Rs. 200 million investment is being undertaken by the SBP". The announcement was made during the Budget 2017-18 Speech by the Finance Minister. What benefits would a Pakistani get if Government opens its own e-payment gateway. Business and

Freelance community would be able to do transactions with just few clicks either from their PC or smartphone. Transactions would be faster. Moreover, the Finance Minister also announced many benefits for IT sector in his budget speech such as tax exemption for the first three years of establishment of Technology companies and startups. In addition, IT exports from Gilgit and FATA would be tax exempted. Owing to capitalize upon the boom in the smartphone market, Govt. has reduced withholding tax on mobile phones from 14pc to 12.5pc to further attract foreign brands. The Minister also asserted that import duty on the telecom products would be reduced and withholding



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ARTICLE

Building the Industry 4.0 Enterprise



Jad Hajj

Partner with Strategy& (formerly Booz & Company), part of the PwC network



Hani Zein

Manager with Strategy& (formerly Booz & Company), part of the PwC network

Industrial companies in the GCC are facing the disruptive power of Industry 4.0, the new wave of intelligent automation that is transforming manufacturing. Embracing this fourth industrial revolution would allow many of them to leapfrog stages of development and compete with the best globally. To fully capitalize on Industry 4.0's benefits, industrial companies need to develop new capabilities over the next two to three years, and radically transform their organizations.

Leading companies worldwide are investing over \$900 billion per year in digitizing their products and services, adopting digital business models, and exploiting the data they are generating, according to PwC's "Industry 4.0 Global Survey."

Industry 4.0 uses digital technology to achieve the seamless integration of industrial products, value chains, and business models. At the production stage, for example, self-operating manufacturing plants require virtually no staff. Assets in these facilities are constantly connected through the Internet of Things (IoT), smart sensors that create a continuous flow of data between machines, which helps rapidly identify opportunities to improve performance. Getting into more detail, wearable technology such as smart watches or smart glasses can facilitate communication between engineers and on-site staff, which saves time and resources on training and maintenance. The result is considerable efficiency gains and higher quality output.

Leading companies worldwide are investing over \$900 billion per year in digitizing their products and services, adopting digital business models, and exploiting the data they are generating, according to PwC's "Industry 4.0 Global Survey." By 2020, the number companies that consider their level of digitization to be advanced is anticipated to be 72%, up from just 33% in 2016.

Some GCC companies are already on track to realize above-average efficiency gains and cost savings from Industry 4.0, particularly in the fields of engineering and construction, industrial manufacturing, transportation and logistics, and chemicals and metals. PwC's "2016 Middle East Industry 4.0

Survey" found that by 2020, 52 of these companies expect average annual digital revenue increases of 3.8% (compared to 2.9% globally).

However, only a few of these companies have fully digitized their internal operations. Most rely heavily on expatriate staff and have labor-intensive manufacturing operations, which further makes it even more important to digitize. They also have limited data capabilities, and express major concerns about safeguarding data, communications, and intellectual property.

To successfully achieve their Industry 4.0 transformation, GCC companies need to follow six practical steps to acquire and deploy digital capabilities:

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1. Map out an Industry 4.0 strategy

Companies should take a holistic approach to setting their digitization strategy. This starts with evaluating their current level of digitization to determine which solutions to implement across their production, value chains, and business model. In doing so, they should consider how these solutions could enhance how they interact with suppliers, technology partners, employees, and customers. They also need to ensure stakeholders are aligned with this strategy and are aware of its benefits, so they can engage them as champions to drive change.

2. Create initial pilot projects

Launching pilot projects with a measurable scope and outcomes can demonstrate the business benefits of digitization. For example, installing track-and-trace devices on products can give manufacturers a better, real-time view of their inventory and shipments. To lead these projects effectively, companies should assign cross-functional teams, supported by IT and HR enablers. Successful pilot projects will generate support for future, larger-scale initiatives.

Based on experience from pilot projects, companies can determine which enablers they must focus on to build enhanced capabilities. On the organizational level, they should encourage experimentation in developing new ideas, unconstrained by legacy thinking.

3. Define needed capabilities

Based on experience from pilot projects, companies can determine which enablers they must focus on to build enhanced capabilities. On the organizational level, they should encourage experimentation in developing new ideas, unconstrained by legacy thinking. In terms of people, they should hire new talent, train existing staff, and introduce new roles into their organization. When it comes to processes, they should create user-friendly internal systems to promote wider usage—while implementing rigorous security protocols to deter cyberattacks. Finally, they should look to update their technology, for example by building an IT function capable of delivering improved performance and security, or introducing more IoT-enabled devices into production lines or warehouses.

4. Master data analytics

Exploiting data more efficiently is the key to improving products, services, and operations. For example, smart sensors on production line assets can provide engineers with data about their performance, which can then be used to predict maintenance checks and schedule them ahead of time. In turn, this can lead to more informed purchasing decisions and improved safety measures. Wearable devices can improve staff safety and time management. To be effective, these capabilities should be fully incorporated into the way companies manage their business processes.

5. Transform into a digital enterprise

An Industry 4.0 company is about more than technology processes: at its core is an enterprise-wide digital culture that

ensures maximum stakeholder buy-in and retains top talent. In such a digital enterprise, a chief innovation officer (CIO) or chief digital officer (CDO) should lead the transformation and prioritize new digital solutions. They would be supported by cross-functional teams responsible for developing and rolling out new capabilities such as IT specifications, models, guidelines, and usability.

6. Actively plan an ecosystem approach

In the face of growing commoditization, industrial companies should broaden their products' digital service offerings. From adding simple features like communication or tracking devices to their products, they can then facilitate communication with partners' or competitors' products, software, and applications using an "ecosystem" approach. Ultimately, this means better access to customer data, which will be analyzed to better forecast their needs, improve products and develop new ones.

By following these steps, GCC industrial companies can qualify to compete internally and globally. If not, they risk being left behind and seeing their products reduced to commodities. The key is to act now and drive change across their value chains. 

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SATELLITE NEWS

European Space Agency Joins Forces for 5G Satellite

The European Space Agency met with industry leaders at the recent Paris Air Show to discuss not airplanes or space, but cell phones. The meeting was held because the next generation of



cellular networking, or 5G, which could be critical for autonomous technology and advanced communications in the coming decade. "5G provides a major opportunity for our space industry, for space and satellites to become integral parts of the future generation of communications networks and services," Magali Vaissiere, the ESA's Director of Telecommunications and Integrated Applications, said in a statement. "[O]ur key industrial stakeholders are ready to join forces in response to this industrial

ambition." The meeting, which included satellite operators, manufacturers, and telecommunications officials, is a critical step for the agency, which wants to get 5G trials underway in the next three years. The ESA will hold a spacecom conference in Brussels to discuss the work to be done call for industry partners to sign on by the end of the year. The meeting is a big step forward for 5G in Europe, but what the next-generation of communication will actually do remains murky.

SES' AMC 9 is Slowly Drifting out of Orbit

Following an anomaly that occurred last week, SES' AMC 9 satellite is drifting away from a fully synchronous orbit at a rate just under 0.2 degrees per day, Markus Payer, SES vice president of corporate communications, told Via Satellite. The company first noticed the anomaly on Saturday, June 17, and immediately began the process of transferring its customers to alternative capacity, which is still underway. "Luckily ... we have a large fleet and therefore can provide alternatives," Payer said. However, SES and Thales Alenia Space, the satellite's manufacturer, have yet to identify the root cause of the anomaly, which may be connected to the satellite being nudged out of orbit. It remains to be seen whether SES will be able to re-establish a connection. If AMC 9 cannot be recovered, the financial impact on the company's revenue could be up to 20 million euros (\$22.7 million), the company said in a statement. Payer also noted that that AMC 9 occupies a relatively eccentric

Geostationary Orbit (GEO), which limits the likelihood of it crossing paths with another asset. Nonetheless, SES has switched off AMC 9's payload to ensure it does not interfere with signals from other satellites nearby. Payer said too that the company is meticulously observing the satellite and keeping in touch with owners of other assets in the neighborhood to

exactly what we can or cannot do with AMC 9," said Payer. "We have to wait for the end of that process to see if we can get in touch with the satellite again, and whether then we can give commands and get telemetry from the satellite itself." AMC 9 was already reaching the end of its nominal 15-year lifespan, having been launched back in 2003. It carries 24 Ku-



prevent any further incidents. As yet, SES has not adjusted its deployment plan for future satellites. "Further fleet planning can only kick in when we know

band and 24 C-band transponders and provides coverage over the United States and Mexico.

Russia to Spend RUB 90 Bln on Satellites for Arctic Region

Russian Ministry of Communications and Mass Media said it will cost RUB 90 billion

to launch a telecom satellite system to cover the Arctic region. The government

plans to allocate RUB 50 billion for the project.

FCC Grants Approval for OneWeb Megaconstellation

Ajit Pai, Chairman of the Federal Communications Commission, released a statement this week confirming that the FCC has approved OneWeb's petition to enter the U.S. market with its planned constellation of 720 satellites. According to OneWeb, its Low Earth Orbit (LEO) constellation will make broadband access available to individuals across the world who have limited or no access today. When fully deployed, OneWeb's system will support a variety of services in the U.S. and globally, including cellular backhaul, mobility services, community and residential internet access, and emergency communications. OneWeb's constellation will operate at an altitude of 1,200 km, enabling low latency internet access that is comparable with terrestrial solutions, according to the company. Low latency is required for supporting cloud-based applications such as trading, e-games, e-medicine, Voice Over Internet Protocol (VOIP), and Machine-to-Machine (M2M) services. The system will use Ku-band user terminals, and a small number of globally distributed Ka-band gateway antennas. "After OneWeb filed its petition, several other companies did the same or applied for a U.S. license in

the same spectrum bands," said Pai. "We hope to approve many more constellations because we know that the more companies compete, the more consumers win. Additionally, the Commission also has an ongoing rulemaking proceeding proposing to update the current NGSO Fixed Satellite Service rules to better accommodate this next generation of systems."



Nigeria is Getting a New DTH Platform

ABS and Telkom Satellites TV (TSTV) signed a multi-transponder agreement to deliver a Direct-to-Home (DTH) broadcast service into Nigeria on the ABS 3A

satellite. The new platform is scheduled to launch on July 25 and will be distributed on the ABS 3A Africa beam, located at 3 degrees west. The service will air more

than 100 TV channels, and TSTV expects the number to grow to 150 soon after. "Our vision is to provide premium video experience to Nigerians at affordable prices," said Bright Echefu, TSTV managing director and Chief Executive Officer (CEO). "Our services will enable the viewers to experience HD and SD video and internet surfing at the same time. We are the first indigenous local operator in the region to launch such a premium platform with a variety of services to Nigerians, who have been so far paying exorbitant prices to foreign operators." According to ABS, the orbital slot of the ABS 3A beam at 3 degrees west is apt for Nigeria due to its high elevation angle and clear line of sight across the country.



Second GPS 3 Satellite Ready for Environmental Testing

In a specialized cleanroom designed to streamline satellite production, Lockheed Martin is in full production building GPS 3, the next-generation constellation of GPS satellites. The company's second GPS 3 satellite is now assembled and preparing for environmental testing, and the third satellite is close behind, having just received its navigation payload. The U.S. Air Force's second GPS 3 satellite was fully assembled and entered into Space Vehicle (SV) single line flow

when Lockheed Martin technicians successfully integrated its system module, propulsion core and antenna deck. According to Lockheed Martin, GPS 3 SV02 smoothly came together through a series of carefully orchestrated manufacturing maneuvers using a 10-ton crane. "Now fully-integrated, GPS 3 SV02 will begin environmental testing this summer to ensure the satellite is ready for the rigors of space," said Mark Stewart, vice president of navigation systems for

Lockheed Martin. "This testing simulates harsh launch and space environments the satellite will endure, and further reduces any risk prior to it being available for launch in 2018." This next generation of GPS satellites will have three times better accuracy and up to eight times improved anti-jamming capabilities, according to the company. Spacecraft life will extend to 15 years, 25 percent longer than the newest GPS satellites on-orbit today.

LeoSat Joins Forces with ESA on Satellite for 5G

LeoSat, which is launching a constellation of up to 108 Low Earth Orbit (LEO) data communications satellites, has signed a joint statement with the European Space Agency (ESA) and 15 satellite industry leaders to develop and demonstrate the added value that satellite brings in the context of 5G. With data traffic predicted to increase almost four-fold by 2020 to 4 ZB per year, one of the key challenges for the mobility sector is achieving scalable, flexible solutions for their expanding networks. Backhaul for mobile networks is crucial to ensure speed and capacity for data transportation from distributed network sites to the network core. Now with the new developments in satellite constellations, next generation LEO systems such as LeoSat's can potentially provide the connectivity, resilience and security required by 5G for significant sectors of industry. As part of an ESA Satellite for 5G initiative foreseen over 2018 to 2020 and beyond, ESA and

the European space industry will work together on: 5G service trials, including satellite capabilities, with a focus on selected sectors targeted by 5G such as transport, media and entertainment, and public safety; transversal activities in the areas of applications development, standardization, resource management aspects, interoperability demonstration campaigns, and

supporting technologies; and outreach activities. Magali Vaissiere, ESA director of telecommunications and integrated applications, and representatives from 16 satellite operators, service providers and manufacturers signed the joint statement. It advocates for further convergence between European industry and institutions on 5G.



Eutelsat Signs First Customers for Konnect Africa Broadband Service

The Konnect Africa broadband venture set up by Eutelsat Communications has officially launched new-generation services this month, starting in Benin, Cameroon, Kenya, Lesotho, Nigeria, South Africa, Swaziland, Tanzania and Uganda. Konnect Africa's service offerings and products include packaged offers inspired by "pay-as-you-go" models and Wi-Fi hotspot schemes. First partners include local operators, telecom companies

and resellers, notably AfrikaNet GoSat (Cameroon, Cote d'Ivoire), Bentley Walker (multiple African markets), Bloosat (Cameroon, Central Africa), Coollink (Nigeria), Global Broadband Solution (Democratic Republic of Congo), Terrace Projects (South Africa), Ubora Systems (Kenya), as well as China Telecom that is establishing communications links between the African continent and the Asia-Pacific region. Konnect Africa is

initially using capacity on Yahsat's Al Yah 2 satellite, which carries 16 Ka-band spotbeams, with expansion supported by a further 18 spotbeams on the Al Yah 3 satellite scheduled for launch by the end of 2017. Konnect Africa aims to cover most of Sub-Saharan Africa by 2019.

Thuraya and Startup Else Form Strategic Alliance

With guidance from Picone Advisory Group, Swiss space startup Else has formed a strategic alliance with Thuraya Telecommunications. The two companies have signed a Memorandum of Understanding (MoU) that allows both companies to collaborate and benefit from each other's capabilities on multiple fronts, including technical, regulatory, and sales and marketing. In addition to expediting access to the market, the agreement between Thuraya

and Else extends both their product and service portfolios. Else had retained Picone Advisory Group to help the Swiss company acquire funding for its 64-nanosatellite constellation AstroCast. AstroCast is a network of nanosatellites that will provide global Machine-to-Machine (M2M) communication for businesses worldwide. According to Else, the constellation will allow companies to connect assets to information systems through Internet of Things (IoT) services.

The first satellites are scheduled for launch by 2018, as a demonstration mission, with a plan to have a total of 64 satellites in orbit by 2021. Once fully operational, the constellation will provide remote monitoring, geolocation services, predictive maintenance, and intelligent data gathering. According to Else, the full scope of markets that will benefit from these capabilities include retail, agriculture, automotive, utilities, maritime, and oil and gas, among others.

Thuraya Launches IP M2M Service for Remote IOT

Thuraya Telecommunications announced the launch of its Thuraya IP M2M Service to support high volume, high throughput Machine-to-Machine (M2M) applications. By Thuraya's real-time, two-way Internet Protocol (IP) network with speeds of up to 444 Kbps, a Remote Terminal Management (RTM) platform and the Thuraya IP+ terminal. According to the company, the new



service extends the capabilities of the company's IP+ terminal to support a wider range of M2M applications. Thuraya designed the service for efficient communication between devices and for the control and consolidation of data from remote equipment. The service targets a number of sectors including oil and gas, utilities, renewable energy, banking and government. The RTM platform provides a set of connectivity management features including usage monitoring, connection control, abnormal session management, geo-fencing, firewall management, usage traffic graphs and charts. Its device management features allow users to view a connected terminal's position, signal strength and current status. Users can also reboot and configure the terminal remotely. "The rise in IoT applications and M2M adoption has triggered an increase in demand among several sectors for higher throughput applications deployed over satellite. Some of these solutions include video- and image capturing for surveillance and security; oil and gas real-time applications; smart-grid Remote Terminal Unit (RTU) recloser connectivity, and wind and solar farm monitoring," said Thuraya's Acting Chief Commercial Officer (CCO) Rashid Baba.

PacSci EMC Successfully Launches Demonstrator Satellite

PacSci EMC has successfully launched its own on-orbit technology demonstrator satellite, PacSciSat. The company will conduct payload tests to

prove the performance of several of its commercial space technologies once the satellite is commissioned and in orbit. PacSci EMC's intent with this mission was to give the company's customers



additional assurance and confidence that an electronic controller and propulsion system performs as specified in the harsh space environment where reliability,

precision and control are paramount. PacSci EMC self-funded PacSciSat to establish flight heritage for these products. The satellite launched on June 22 onboard the Indian Space Research

Organization (ISRO) Polar Satellite Launch Vehicle flight C38 (PSLV-C38) from the Satish Dhawan Space Centre in India. The satellite is equipped with two Smart Energetics Architecture (SEA) controllers, four Modular Architecture Propulsion System (MAPS) rocket motors, two Smart Initiators and two space standard initiators. After a two-week satellite commissioning period once the satellite is in orbit, PacSci will conduct payload tests using the SEA controllers to fire the initiators and MAPS rocket motors. MAPS is a solid, clean-burning propellant array of rocket motors, which are fired in pairs to maneuver the satellite. SEA technology actuates hundreds of devices on launch vehicles and satellites while taking up little volume, mass or power, and can actuate launch vehicle rocket motors, stage separation systems, release devices and deploy satellites into space. On satellites and space vehicles, SEA technology can deploy solar arrays, scientific instruments and other devices, and can use either pyrotechnic or non-explosive, motorized actuators in any combination needed.

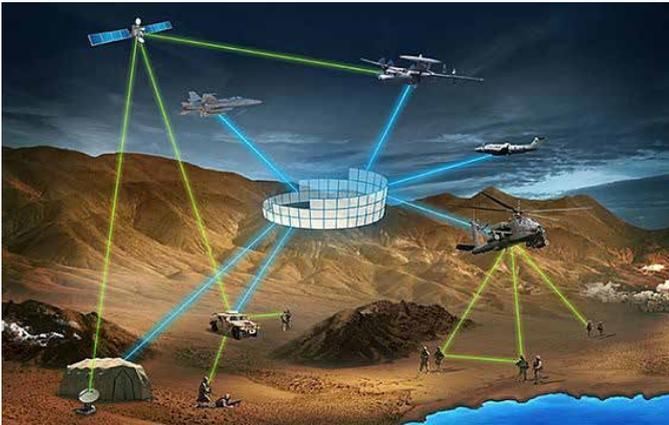
US Army to Install ViaSat Small Tactical Terminals

Boeing has awarded ViaSat a multi-year contract for two-channel Small Tactical Terminals (STTs) for the AH-64E Apache Guardian. Production of ViaSat's KOR-24A Link 16 terminal will be designated for the U.S. Army and foreign military sales. The base contract covers a minimum of 534 terminals to be produced over the next four years. ViaSat said that contract would eventually contain options. ViaSat said the STT was developed with private funds to meet forecasted warfighter

requirements. The non-developmental item can deliver faster capabilities at a lower total lifecycle cost, the company said, compared to other programs of record such as the Multifunctional Information Distribution System Joint Tactical Radio System (MIDS JTRS). "This award, along with other customers for the STT, has caused us to initiate a pre-planned production ramp up to approximately 35 terminals per month, leveraging investments we have already

made in our capacity based upon this forecast demand," said Andy Kessler, business area director for ViaSat's next generation tactical datalink systems. "Coupled with more than 600 terminals already in the field today, we expect to eclipse 1,000 STTs deployed

worldwide by early in 2018." The STT will provide the AH-64E with a Link 16 common operating picture, enhancing situational awareness in the multi-role combat helicopter and providing a soldier radio waveform capability for Air-to-Ground (ATG) communication. These integrations should also improve the aircraft's lethality and survivability, according to ViaSat. In March, the U.S. Army granted Boeing a five-year deal for the AH-64E. It was the first multi-year agreement for the Apache's E variant. The contract covers full-rate production of remanufactured aircraft and new-build aircraft, remanufactured and new-build Longbow crew trainers, ground support equipment, initial spares, integrated logistics support and engineering technical services. Boeing said the U.S. Army is to receive 244 remanufactured units, while 24 new units will go to the foreign customer. This story was originally published in Rotor and Wing, a Via Satellite sister publication. It has been edited to better serve our audience.



Hughes Launches Integrated Broadband and 4G Network Platform

Hughes Network Systems announced the addition of the Fortinet FortiGate 30E to its portfolio of managed network equipment. According to Hughes, the FortiGate 30E is a solution geared toward financial, retail petroleum, convenience store, and restaurant businesses seeking an integrated and secure single-device broadband solution at their retail locations. The FortiGate 30E is available as part of the HughesOn suite of managed network

services, which combine broadband connectivity, installation, provisioning, and on-site support. It can also be self-installed for those merchants who prefer to implement and maintain their own equipment, using internet service from a local provider. The FortiGate 30E is an all-in-one enterprise platform that is part of the Fortinet Security Fabric, receiving real-time threat intelligence updates to ensure continuous protection from cyber

threats. In a statement, Hughes said the FortiGate 30E is ideally suited to serve distributed enterprises and supports integrated 4G/LTE modems for unified connectivity and wireless backup; Internet Protocol Security (IPsec) Virtual Private Network (VPN) over the internet to enable managed PCI-compliant networks; and plug-and-play capability.

Orange Centrafrique Teams Up With Satellite Provider SES Networks to Offer Improved 3G Coverage

Central African Republic's second largest mobile network operator (MNO) by subscribers, Orange Centrafrique, has partnered with satellite provider SES Networks with a view to delivering faster and better quality 3G services to its customers. Under the agreement

between the two companies, SES Networks will use its Medium Earth Orbit fleet and ground infrastructure to deliver an 'IP Transit' solution for Orange, with the latter's CEO Corinne Loze saying of the plans: 'A satellite-based solution is ideal for a country like Central African

Republic, with its challenging terrain and lack of terrestrial infrastructure, resulting in low internet penetration. This new solution offers instant reach and better speed, allowing access to the very best of enterprise applications and a seamless user experience for all customers.'

China's Quantum Satellite May 'Change the Internet'

The satellite is called Micius, and it is said to be the first of its kind. The satellite was launched from the Gobi desert Jiuquan Satellite Launch Center in August 2016. The results of the trial have now been revealed. The name Micius derives from an ancient Chinese scientist and philosopher (sometimes spelled Mozi). Micius forms part of a wider Quantum Experiments at Space Scale (QESS) study. QESS is a proof-of-concept mission designed to facilitate quantum optics experiments over long distances to allow the development of quantum encryption and quantum teleportation technology. The communications system uses a process called entanglement to allow for communication that is safe against eavesdropping or decryption by a third party. This is achieved by optical technology which utilizes quantum computing; Micius uses pairs of entangled photons sent with random polarization. The idea is that two parties who wish to communicate are sent one half of the pair. Security is built-in due to the concept of 'quantum uncertainty'. This is the property that allows those engaged in secret communications to know if they are being spied on: the eavesdropper's efforts would mess up the connection. The idea was first put forward by German physicist Werner Heisenberg in 1927. Micius contains delicate optical equipment and data is transmitted to two mountain-top Earth

bases which are 1,203 kilometers apart (in China and Austria). In trials reported in June 2017 pairs of photons to facilitate the communication have been beamed to the two sites, allowing for secure communication to take place. Interviewed by New Scientist, Anton Zeilinger, an expert on quantum physics at the University of Vienna in Austria, said: "This is the first step towards worldwide secure quantum communications, and maybe even a quantum Internet." In addition, lead researcher Jian-Wei Pan, who is based in Hefei in China's Anhui Province, told the BBC: "I think we have started a

worldwide quantum space race." The hardest part of the communications feat was ensuring that the entangled photons would not be destroyed while traveling through about 10 kilometers of lower atmosphere. This required focusing the photons through special receivers, with the ground stations using adaptive optics. The satellite continues to circle the Earth, transmitting information. The communications success has been published in the journal Science, under the title "Satellite-based entanglement distribution over 1200 kilometers.



Hytera Communications Finalizes Acquisition of Norsat

Norsat International announced that it has entered into an amended arrangement agreement with Hytera Project, a subsidiary of Hytera Communications, under which Hytera will acquire all the issued and outstanding shares of Norsat for \$11.25 per share. The proposed transaction values Norsat at an equity value of approximately \$69 million. The agreement comes following

an offer from Private Fund Management to acquire Norsat for \$11 per share. After Norsat notified Hytera of the offer, Hytera returned with a superior proposal that Norsat's independent board of directors ultimately decided was in the best interest of Norsat and its shareholders. According to Norsat, the new arrangement will be subject to a number of customary conditions, including the approval of

Norsat securityholders and certain regulatory approvals including under the Investment Canada Act. "We are pleased that we were able to conclude a revised agreement with Hytera. We continue to believe this all-cash transaction offers Norsat shareholders immediate liquidity and certainty of value," said Fabio Doninelli, director and chairman of Norsat's board of directors.

Inmarsat Expands Installation Support to Meet Fleet Xpress Demand

To meet unexpected levels of demand for its Fleet Xpress service, Inmarsat is boosting the number of ports where a complete service installation with a flat fee is available from six to 33. Fleet Xpress installation will now be available at 12 Asia Pacific ports, 11 in the Europe, Middle-East and Africa region, and 10 ports in the Americas. Inmarsat-certified engineers will undertake all the work, according to the company. Inmarsat's enhancement of its installation capabilities is part of the company's strategy to support the global adoption of the Fleet Xpress service, which combines Inmarsat's Global Xpress and L-band networks. Ronald Spithout, president of Inmarsat maritime, said Inmarsat will continue to prioritize the expansion of its global service capabilities in support of the surge in Fleet Xpress installations. He cited the role played by hardware partners Cobham Satcom and Intellian, and service agreements such as that recently announced with Radio Holland, as key

to enabling fast industry transition to connectivity with Fleet Xpress. Inmarsat also continues to incentivize end-users and strategic partners to fast-track Fleet Xpress installation and conversion. Most recently, the company announced a flat fee charge of \$3,000 for every vessel that commits to an installation date by Dec. 31 at either an existing key

port or one of its newly identified key ports. Inmarsat estimates that such a commitment could be worth up to \$5,000 per vessel to a prospective customer, because it effectively waives fees that would otherwise be levied for preparation, administration and activation, as well as installer travel costs and waiting time.



Researchers Measure Satellite Quantum States from the Ground

In a new study, researchers demonstrate ground-based measurements of quantum states sent by a laser aboard a satellite 38,000 kilometers above Earth. This is the first time that quantum states have been measured so carefully from so far away. "We were quite surprised by how well the quantum states survived traveling through the atmospheric turbulence to a ground station," said Christoph Marquardt from the Max Planck Institute for the Science of Light in Germany. "The paper demonstrates that technology on satellites, already space-proof against severe environmental tests, can be used to achieve quantum-limited measurements, thus making a satellite quantum communication network possible. This greatly cuts down on development time, meaning it could be possible to have such a system as soon as five years from now." A satellite-based quantum-based encryption network would provide an extremely secure way to encrypt data sent over long distances, according to the researchers. Today,

text messages, banking transactions and health information are all encrypted with techniques based on mathematical algorithms. This approach works because it is extremely difficult to figure out the exact algorithm used to encrypt a given piece of data. However, experts believe that computers powerful enough to crack these encryption codes are likely to be available in the next 10 to 20 years. The looming security threat has placed more attention on implementing stronger encryption techniques such as quantum key distribution. Rather than relying on math, quantum key distribution uses properties of light particles known as quantum states to encode and send the key needed to decrypt encoded data. If someone tries to measure the light particles to steal the key, it changes the particles' behavior in a way that alerts the intended communicating parties that the key has been compromised and should not be used. The fact that this system detects eavesdropping means that secure communication is guaranteed,

according to the study. Although methods for quantum encryption have been in development for more than a decade, they don't work over long distances because residual light losses in optical fibers used for telecommunications networks on the ground degrade the sensitive quantum signals. Quantum signals cannot be also regenerated without altering their properties by using optical amplifiers as it is done for classical optical data. For this reason, there has been a recent push to develop a satellite-based quantum communication network to link ground-based quantum encryption networks located in different metropolitan areas, countries and continents. While the new findings showed that quantum communication satellite networks do not need to be designed from scratch, Marquardt notes that it will still take five to 10 years to convert ground based systems to quantum-based encryption to communicate quantum states with the satellites.

Globecomm Expands Global Ku-Band VSAT Footprint

Globecomm announced a further expansion of its Ku-band Very Small Aperture Terminal (VSAT) network, serving enterprise, maritime and government markets around the world. Globecomm's network, which includes a footprint over the Barents Sea, North of Scandinavia, will be extending its coverage by adding the South Indian Ocean passage between the southern tip of Africa and Australia. Globecomm VSAT customers have increased transit to these areas in recent months, leading the company to invest in the extended coverage. According to Globecomm, the expanded network will provide 100 percent coverage of all major shipping routes to address new market demands. Another factor that led the company to commit to expanded coverage is the growth of industrial Internet of Things (IoT) services through Globecomm's previously announced partnership with AT&T, stated Globecomm Chief Commercial Officer (CCO) Bryan McGuirk. Globecomm's international network consists of multiple teleports connected by high-capacity, redundant fiber to the world's major telecom points of presence.

The company's C- and Ku-band capacity covers the major land masses and shipping lanes to provide global coverage for media, telecom, government, maritime and enterprise applications. For maritime customers, Globecomm VSAT provides hardware (purchased or leased), systems integration, satellite bandwidth and lifecycle support services. Globecomm

VSAT also integrates with other broadband systems including Inmarsat FleetBroadband, Iridium OpenPort and land-based wireless networks. It automatically switches between satellite beams and from VSAT to other services to maintain connectivity without manual re-pointing of antennas or any other intervention by the crew.



ViaSat 2 to Significantly Improve Broadband Communications

Leveraging the Boeing 702 high-power satellite bus, ViaSat's second-generation satellite, ViaSat 2, will realize a seven-fold increase in broadband internet service coverage from its previous generation satellite and offer twice as much capacity on orbit, according to the company. ViaSat 2 will expand broadband services across North America, Central America,

the Caribbean, a portion of northern South America, as well as the primary aeronautical and maritime routes across the Atlantic Ocean between North America and Europe, and will also offer flexibility to move satellite capacity to where broadband demand exists. While this is the first satellite Boeing built for the company, Boeing is on contract to

build two more satellites under the ViaSat 3 program, both based on the 702 design and integrated with ViaSat payload technology. ViaSat 2 was launched and sent its first signals from space on June 1. ViaSat expects it will take several months for the satellite to reach its final orbital destination, located at 69.9 degrees west longitude.

Etisalat Launches High Throughput Satellite at 170 Mbps

Etisalat today announced the launch of a new class of High Throughput Satellite (HTS) service to provide high capacity, efficiency, performance and multi-band connectivity to address business segments in remote locations or harsh environment. The new first of a kind service provides customers with higher speeds, improved coverage

and flexibility by maximizing the VSAT throughput and spectral efficiency and optimizing network performance at an affordable price. Oscar Garcia, Senior Vice President, Etisalat Business said: "Etisalat new HTS services will be able to reach out to a wider industry segment offering affordable satellite solutions. The service seamlessly integrates with

the customer's network providing high scalability, redundancy and resiliency and meet customer's requirement where fiber connectivity is not available." Etisalat currently offers diverse VSAT solutions for voice, data, internet, 4G and video connectivity anytime anywhere via satellites.

Iridium Next Satellites Prep for Second Launch

Iridium Communications announced that all 10 Iridium Next satellites have arrived at Vandenberg Air Force Base in California and are being processed for the second launch. Scheduled for June 25 at 1:25 pm PDT (20:25 UTC), this launch continues the deployment cadence for the additional six SpaceX launches of Iridium Next satellites. The June 25 launch is the second of eight launches for the Iridium Next program. Under the lead of Thales Alenia Space, the satellites were shipped in pairs from the Orbital ATK Satellite Manufacturing Facility in Gilbert, Arizona, and transported in specially designed motion and temperature-controlled shipping containers. Upon arrival, each satellite began pre-launch processing, which will continue up until launch day. This includes mating them to the dispensers,

fueling, and encapsulation within the payload fairing. Simultaneously, SpaceX is processing the first and second stages for static fire and launch. All components are on-site and on schedule at this time for launch. Iridium Next is the company's next-generation global satellite constellation scheduled for completion in 2018. The constellation will introduce new capabilities including Iridium Certus, Iridium's next-generation multi-service communications platform that aims to deliver broadband speeds over L-band for aviation, maritime, land mobile, Internet of Things (IoT) and government organizations. It will also enable the Aireon space-based Automatic Dependent Surveillance-Broadcast (ADS-B) real-time, global aircraft surveillance and flight tracking system.



Eutelsat Signs New Launch Contract with Arianespace

Following the launch earlier today of the EUTELSAT 172B satellite, Eutelsat Communications (NYSE Euronext Paris: ETL) announces a new launch services contract with Arianespace. The Arianespace order book now includes three future launches for Eutelsat in addition to the 32 Eutelsat satellites already



launched by the European launch services provider over more than 30 years for one of the world's leading satellite operators. Of the three satellites to be launched, EUTELSAT 7C (built by SSL) will be orbited in 2018, followed in 2019 by Eutelsat Quantum built by Airbus and the high throughput satellite built by Thales. Commenting on this latest contract, Rodolphe Belmer, Chief Executive Officer of Eutelsat, said: "Following today's historic Ariane launch of Europe's first high-power all-electric satellite, we are proud to once again team up with Arianespace, a long-standing partner and a leader in Europe's vibrant space industry. The technological diversity of the three new satellites entrusted to Arianespace is a compelling reflection of our commitment to innovation for the greater benefit of our customers, and to maintaining our competitiveness." Stéphane Israël, Chief Executive Officer of Arianespace, added: "This latest contract bolsters Eutelsat's position as a benchmark customer of Europe's heavy launcher, since Ariane 5 will launch three satellites for the European operator in 2018 and 2019. Our hope is that Ariane 6 will subsequently take over so that we can help Eutelsat meet its objectives even more efficiently."

Intelsat Drops Merger with OneWeb after Debtholders Resist

Intelsat has abandoned its proposed merger with OneWeb after failing to gain approval from its debtholders. After several extensions of the exchange offer first announced in late February, Intelsat

concluded at the latest expiry of the offer on 31 May that it would not obtain approval from enough of the bondholders. As a result the company said it expects to terminate the agreement with OneWeb,

including the plan for OneWeb shareholder Softbank to inject fresh capital in the merged company. In a statement, Intelsat said it was disappointed the deal would not go ahead.

Inmarsat Orders New GX Satellite

Global mobile satellite communications provider Inmarsat has awarded a contract for an additional Global Xpress satellite and revealed Qatar Airways had become the first Middle East megacARRIER to select the new GX Aviation in-flight broadband solution. Inmarsat said it had awarded the new GX satellite contract to Thales Alenia Space. Inmarsat said the award reflected its strategy of adding capacity to its already established, unique, high-speed global broadband network in areas of high customer demand and against new customer commitments. It said the satellite, which was targeted for launch in 2019, would be a Very High Throughput Satellite (V-HTS), providing capacity across the Middle East, Europe and the Indian subcontinent. The payload would seamlessly become part of Inmarsat's existing GX high-speed global broadband network. Inmarsat also announced that

Qatar Airways had become the first Middle East megacARRIER to select the group's advanced new GX Aviation in-flight broadband solution. Inmarsat said the next-generation service would initially be available to Qatar Airways passengers on board more than 130 aircraft, consisting of Airbus A350s and Boeing 777s. It said GX Aviation technology had already been equipped on Qatar Airways' latest Airbus A350s and installations on the airline's remaining Airbus A350s, together with the Boeing 777s, would commence on a retrofit basis from this summer. Inmarsat Aviation president Leo Mondale said: "Qatar Airways is one of the world's most successful, fastest growing and in-demand airlines, with an unwavering focus on providing the best service possible. "It has offered Inmarsat's SwiftBroadband connectivity solution for over five years now. However, with our next generation

GX Aviation service now live, its upgrade to true broadband on more than 130 aircraft initially will ensure passengers have access to consistent, reliable and high-speed connectivity wherever they fly. "Qatar Airways considered all available options in the connectivity market and selected Inmarsat due to our unique infrastructure, proven aerospace partners, and committed long-term development strategy."Broadband transformation on the ground is already well advanced and we are able to transfer that into the very challenging in-flight environment, working with Qatar Airways to make connectivity a success. "Our networks are engineered with multiple layers for redundancy and global coverage. Our design philosophy is to scale up capacity over time to fit the route systems of our airline customers and reflect the industry's real needs."

Bangabandhu-1 Satellite to Provide Commercial Service from June 2018

The Bangabandhu-1 satellite will be ready to provide commercial service from the middle of next year, said Tarana Halim, state minister for telecom. "We hope to launch the Bangabandhu-1 Satellite commercially by June next year," she told reporters at her office. The state minister recently visited Thales Alenia Space, the French aerospace firm which is manufacturing Bangladesh's first communications satellite. Before starting to provide the commercial services, the satellite will be sent into orbit in December or January, if weather permits, she added. "We can fix the launch date by July." The authorities will have to complete some procedures before the commercial launch, Tarana added. Earlier, the government had targeted December 16 this year as the launch date, to coincide the occasion with the celebration of the

Victory Day. However, after a meeting with Prime Minister's ICT Affairs Adviser Sajeeb Wazed Joy, the division changed the date as the government wants to celebrate the milestone through a countrywide weeklong programme. The satellite will be launched from Florida, US but Prime Minister will be in Dhaka at that time to attend the celebration, said Tarana. The state minister said more than 85 percent of the work on the satellite has been completed; the manufacturer is now only fine-tuning it. In November 2015, Bangladesh Tele-communication Regulatory Commission signed a deal with Thales Alenia Space for designing and manufacturing the satellite at \$248 million (Tk 1,959 crore). The total cost of the project is about Tk 2,967.95 crore. It, however, might come down by a few hundred crores taka, said officials related

to the project. The government is now in the process of forming a separate public limited company to look after all the issues of the broadcast satellite as the local partner of Thales Alenia Space. The satellite is so far the most sophisticated technological project Bangladesh has ever undertaken. Once launched, its services will narrow the digital divide by taking broadcasting and telecom services to rural areas and introducing profitable services, including direct-to-home services. Bangladesh bought the orbital slot from Intersputnik, a Russian satellite company, for \$28 million. Spectra Engineers Ltd, Thales' partner in Bangladesh, is completing two ground handling stations in Gazipur and Rangamati each, a project official said.



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ARTICLE

Transforming Government Services: The Value of Government Cloud Enablement Platform

A new era of government services

All over the world, governments are using information and communications technology—or ICT—to provide unprecedented levels of service to their citizens. They are creating public sector aggregation networks that allow agencies to communicate with each other securely. They are spearheading open data initiatives that make their operations more transparent. They are leading the way to the future with large-scale transformation projects like these that are changing lives.

There is a need to find ways to consolidate government's digital assets and maximize common processes, without squelching the grassroots initiative that is doing so much to transform how governments interact with citizens.

Opportunities exist for stakeholders at every level of government to take the initiative, to build applications or databases, and address the day-to-day issues faced by the public they serve. But the grassroots approach brings its own set of challenges. Schools and universities, hospitals, social services, municipal offices—each government organization has its own IT infrastructure. Development is happening in these isolated IT silos. And that means considerable duplication and waste.

The challenge: there is a need to find ways to consolidate government's digital assets and maximize common processes, without squelching the grassroots initiative that is doing so much to transform how governments interact with citizens.



Dr. Brahim Ghribi

Head of Government Relations
Middle East & Africa, Nokia

NOKIA

Distribute resources, centralize control

Nokia's Government Cloud Enablement Platform—or G-CEP—addresses this need. Nokia has designed an inclusive, end-to-end approach that allows to capture and streamline government's grassroots services development through a distributed open cloud infrastructure.

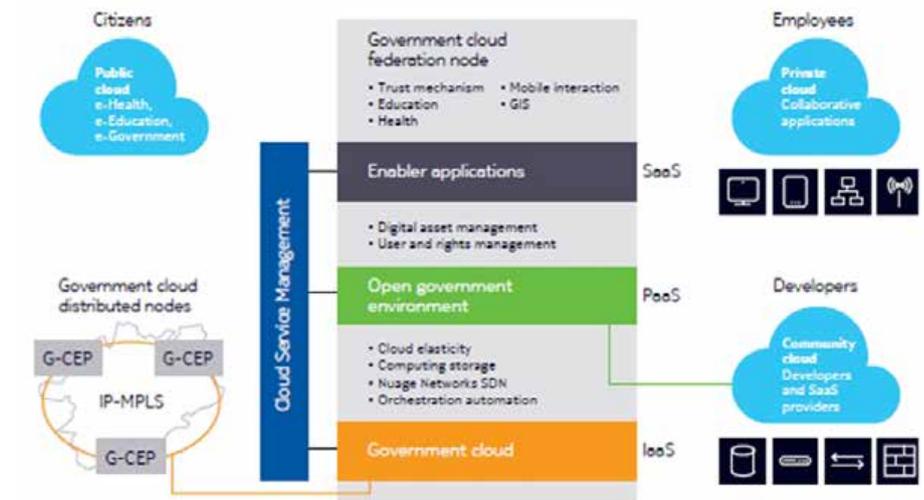
G-CEP brings localized computing, storage and network resources to individual departments, while the Government Cloud service provider controls those resources from a central location as a virtually single datacenter. In doing so, G-CEP consolidates the IT silos. And it encourages teams on the ground to create and build services that can be broadly shared, bringing real value to the public.

G-CEP offers more than cloud infrastructure services. It also offers platform services that can be opened to application developers. The developers build and share, with each application and dataset becoming a foundation for the development of more end-user applications.

The benefits of the distributed cloud

The Nokia G-CEP business model takes advantage of distributed cloud technology. It combines the benefits of a centralized management system with distributed datacenter resources in a scalable architecture.

The different public service organizations benefit from local computing, storage and network resources that live on the premises, bringing very low latency and high service quality to the people these teams serve. G-CEP provides a unified view, controlling these distributed resources from a central location as a single, virtual datacenter.



G-CEP offers more than cloud infrastructure services. It also offers platform services that can be opened to application developers. The developers build and share, with each application and dataset becoming a foundation for the development of more end-user applications. This is called Government as a Platform—or GaaP.

A turnkey implementation

The Nokia's Government Cloud Enablement Platform offers three layers in a turnkey implementation.

G-CEP IaaS: Government distributed cloud infrastructure

The Infrastructure as a Service—or IaaS—layer of G-CEP is a distributed cloud infrastructure. At its core is a single G-CEP federation node that provides a centralized cloud orchestration and management system. Distributed cloud nodes embed network, server and storage infrastructure locally.

G-CEP PaaS: Open government environment

Our open government environment (OGE) is G-CEP's Platform as a Service, or PaaS, layer. It is an open API platform that provides an open, secure, controllable gateway through which government's digital assets can be shared with application developers, SaaS providers, and those who own datasets.

Software procurements are changing from a classical, license-based model to a Software as a Service model. OGE allows

to embrace this model while maintaining control of government's digital assets and operational costs. It also allows access by domain to comply with the different policy requirements across such various areas as health, finance and public safety.

G-CEP SaaS: Enabler applications

And here's the payoff: A streamlined environment that fosters innovation and the successful deployment of new services based on shared enabler applications.

The G-CEP SaaS layer provides common software tools and processes—Enabler Applications such as authentication, e-signature, or mobile communications—which can then be embedded in new end-user applications. These enabler applications are agency agnostic, can be shared by all government bodies, and are accessible via programming interfaces exposed in the G-CEP Open Government Environment.

Through the G-CEP IaaS and PaaS, the G-CEP can enforce common processes and foster the sharing of digital assets such as enforcing a unique authentication mechanism on all applications, imposing one source of document certification, or even encouraging application developers for instance to use a common communication function to optimize costs. 📌

WHOLESALE NEWS

OFCOM Begins Consulting on its Plans to Reduce MTRs between 2018 and 2021

The Telecoms regulator OFCOM has launched a consultation on its market review of mobile termination rates (MTRs) for the period April 1, 2018 to March 31, 2021. In its review, the watchdog said it is seeking to assess competition in the provision of mobile call termination (MCT) and to consider the appropriate form of ex ante regulation, if any, that should be imposed to ensure consumers are protected from 'any harm arising from market power'. In terms of its proposals, OFCOM plans to define the markets as in previous reviews, with its preliminary finding being that there are 80 markets, each corresponding to a provider able to set a ter-

mination charge for calls to the UK mobile numbers allocated to it by the regulator. Notably, it has said it does not intend to widen the market definition to include voice calls terminated using Facetime, Skype or WhatsApp. Meanwhile, under the plans each and every provider holding UK mobile numbers will be deemed as having significant market power (SMP) with respect to the (wholesale) market for terminating calls to the numbers it controls. All 80 of these providers face regulation via the imposition of two of the four remedies that are currently applied in this market, namely: an obligation to provide network access on fair and reasonable

terms and conditions; and a charge control, with a single maximum cap on MTRs to be based on the long-run incremental cost (LRIC) of MCT. In terms of the proposed termination rates, OFCOM is seeking to reduce the charge from its existing level of GBP0.00495 to GBP0.00468 from April 1, 2018, with two further reductions to GBP0.00449 and GBP0.00443 from April 1, 2019 and April 1, 2020, respectively. OFCOM's consultation closes on 5 September 2017, and it has said it plans to notify the European Commission (EC) of its final decision on MCT regulation by February 2018, before publishing a statement by March that year.

Batelco Boosts its Data Roaming Service with Eleven New Worldwide Networks

Batelco, the leading digital solutions provider in the Kingdom of Bahrain, has added 11 new international networks to its Data Roaming Packages to boost its services for customers ahead of the holiday season. The great value roaming packages are now available for Batelco's customers in 60 locations including popular destinations such as the UK, France, Spain, Italy, Indonesia and Turkey. The bolt-ons, which start from only BD5, are available for Postpaid and Prepaid Customers to meet their requirement for lower priced data services while roaming across the GCC and a number of global destinations with speeds up to 4G. Customers who subscribe to the 'Data Roaming Bolt On' pay a standard fixed one-day or seven-day fee based on their choice of package. The range of packages includes 1 day with 1GB roaming in the GCC for only BD5 and 7 days with 5GB roaming in the GCC for only BD10. For worldwide destinations customers can benefit from 1GB roaming for only BD20 for 7 days.



ComReg Consulting on Price Control Obligations for Bundled Services

Ireland's Commission for Communications Regulation (ComReg) has launched a consultation on a draft decision related to price control obligations for bundled services, which it notes relate primarily to price control and transparency obligations for three markets, those being: wholesale local access (WLA) at a

fixed location; wholesale central access (WCA) for mass market products; and wholesale fixed voice access and call origination ('FACO'). ComReg is seeking feedback on its preliminary view of the structure and implementation of a bundles margin squeeze test ('MST'), with its draft decision particularly concerned

with ensuring fixed line incumbent eir cannot cause a margin squeeze between the price of the regulated wholesale regulated services it offers to alternative operators and the price of its own retail bundles. Interested parties have until July 21, 2017 to make submissions to the regulator regarding to the matter.

Telecom Egypt Inks Second National Roaming Agreement

Just over a month after it inked a national roaming agreement with Orange Egypt, Telecom Egypt (TE) has announced a similar deal with another of the nation's cellcos. In a press release the fixed line incumbent confirmed that it has signed a Memorandum of Understanding (MoU) for national roaming with Etisalat Misr. Under this deal – which it was noted falls under the framework of the mobile license signed with the National Telecommunications Regulatory Authority (NTRA) in August 2016 – TE will offer 2G, 3G and 4G mobile connectivity over Etisalat's existing network. It is understood that the agreement will enable it to provide its customers across the country with 'efficient and high-quality mobile services until its own mobile network infrastructure is operational'. Meanwhile, TE has also concluded a MoU with Etisalat Misr for the provision the former's international voice services for the benefit of the latter's customers for a period of five years. Commenting on the deals, Ahmed El Beheiry, TE's managing director and CEO, said: 'Our cooperation agreement with Etisalat Misr is another strong step in our progress to become an integrated telecom operator and reflects

the growing demand for our services. This cooperation assures TE's strategic objective of providing its customers with practical options and innovative solutions through strategic partnerships in its local market.' Late last month TE

at that date said it had already started the implementation of its fully converged Business Support System (BSS), integrating functions such as Customer Relationship Management (CRM), Billing and Point of Sales. Alongside these



announced a MoU with Orange Egypt for a national roaming agreement under which it will provide 2G/3G/4G services over the latter's infrastructure. In order to ensure readiness to roll out mobile services for customers in good time, TE

activities, TE confirmed it is rolling out its own radio network 'to decrease its dependence on national roaming provided through existing mobile operators'.

EU Roaming Charges Finally Scrapped

Long-awaited arrival of roam-like-at-home does not spell the end of the roaming debate. The European Union heralded the long-awaited abolition of retail mobile roaming charges. The consumers travelling within the EU will pay the same rate for voice, messaging and data that they do in their home country. "The end of roaming charges is a true European success story," said a joint statement from the European Council, Commission, and Parliament. "It has been a long time coming, with many actors involved. By working closely together, the European Union has delivered a concrete, positive result for European citizens. We are proud that the EU has put an end to very high roaming prices and thankful to those who showed the determination to overcome

the many challenges and pursue this goal." It marks the culmination of a 10-year campaign kick-started by former EU telecoms commissioner Viviane Reding, who pushed telcos to lower the cost of using mobile services abroad by introducing increasingly lower caps on retail and wholesale roaming tariffs. "Over the last 10 years, our institutions have been working hard together to fix this market failure. Each time a European citizen crossed an EU border, be it for holidays, work, studies or just for a day, they had to worry about using their mobile phones and a high phone bill from the roaming charges when they came home," the EU said. "Roaming charges will now be a thing of the past." While retail roaming rates are a thing of the

past, wholesale roaming rates are not. Telcos must find a way to cover the cost of providing roam-like-at-home services, either by making savings elsewhere in the business, raising prices, or finding a new source of revenue altogether. "Some will roll out new 'more for more' data plans, that are more expensive than previous plans but which offer subscribers more data to use," suggested Bengt Nordstrom, CEO of Swedish telco consultancy Northstream, in a research note. The EU took a somewhat unrepentant standpoint on this matter. "Operators have had two years to prepare for the end of roaming charges, and we are confident that they will seize the opportunities the new rules bring to the benefit of their customers," the EU said.

Ooredoo Takes Customer Roaming Satisfaction to Greater Heights with New Ooredoo Passport GCC

Taking customer roaming satisfaction to the next level, Ooredoo has launched the Ooredoo Passport to provide GCC travelers with two fantastic roaming bundles. Perfect for businesses and frequent flyers, the Ooredoo Passport offers a personalized experience, with daily and weekly benefits to choose from at highly affordable rates. The Ooredoo Passport provides worry free roaming in Bahrain, Qatar, Kuwait, Saudi Arabia, and the UAE with two efficient bundles. The first provides customers

with 1GB of data every day for just OMR 4. The second, for travelers planning longer trips abroad, delivers 2GB and 30 minutes a week for only 10 OMR. Feras Al Shaikh, Director of Consumer Sales at Ooredoo said, "When it comes to running a business or staying close to home, we know being connected at all times is a must. That is why with Ooredoo Passport, you can use your minutes, and data with complete peace of mind throughout five destinations. Whether you require more time online or on your mobile, the variety

offered by each bundle delivers exactly what travelers need to enjoy the internet and stay connected for the duration of their stay." Customers can sign up for the new product by dialing *141*401# for Shahry and *141*501# for Mousbak, selecting it through the Ooredoo Oman app, or by contacting Ooredoo's Contact Centre. To learn more about the Ooredoo Passport and other inspiring products and services, visit ooredoo.om or any of its social media channels.



MVNOs Say Wholesale Roaming Price Caps Still Too High

Wholesale roaming caps in the EU are still too high, even after the big cut planned for 15 June, according to industry group MVNO Europe. The association of MVNOs said it supports the introduction of 'roam-like-at-home' in the EU, and its members are implementing the 'free' roaming for customers. However, as the group warned previously, the still-high wholesale roaming price caps may lead to many providers seeking derogations from RLAH and still applying surcharges for roaming. The industry group called for the European Commission to conduct an in-depth analysis of the impact of the end of roaming fees. Roaming coalition: covers more than 70 million SIM cards across Europe and represents pro-competitive MNOs such as Free,

H3G, RCS&RDS and Play, MVNO Europe members (including Cubic Telecom, Cyta Hellas, Euro Information Telecoms, Fastweb, Liberty Global (incl. VirginMedia UK and IE), PosteMobile, Sierra Wireless, Sky, Transatel, Ventocom and Voiceworks), and other MVNOs CoopVoce and TalkTalk. The effective introduction of roam-like-at-home in Europe depends on a review, by the European Commission, of the wholesale roaming market. Such a review is crucial to allow all operators to fairly compete with each other and for smaller players to continue to offer price-competitive, innovative offers to European consumers and businesses. As European wholesale international roaming charges are currently unjustifiably higher than domestic wholesale prices, the review

should radically reduce the levels of the current regulated wholesale roaming caps set in the 2012 Roaming Regulation (the maximum prices an operator has to pay to the visited network operator when its users are roaming abroad). Without any further steep reduction of the regulated wholesale caps, a large number of mobile operators may decide or be forced to impose restrictions to users when roaming abroad through complex and unfriendly contractual clauses. This would be a disappointing outcome for European users, and it should be avoided at all costs. It would also go against the European Parliament's repeated calls to end roaming surcharges once and for all.

Beeline Expands 4G Roaming

Armenian fixed and mobile telecommunications operator ArmenTel (trading as Beeline) has announced it has increased the number of 4G LTE roaming partners, adding 15 new markets, including Germany, Greece, the United Arab Emirates, France and Japan. ArmenTel chief executive officer Andrei Pyatakhin told reporters: 'Fourth generation networks have opened a new quality of services and internet speeds, several times higher than previously available. Beeline is an active participant of this progress, and besides expanding its own 4G network, it has increased the number of roaming partners it has in other countries'. As a result of the latest deals, Beeline's network of roaming partners consists of 425 operators in 176 countries.



South Korean Government Pushing Operators, MSIP to Reduce Costs for Customers

Under new president Moon Jae-in, South Korea's government is reportedly increasing the pressure on both the Ministry of Science, ICT and Future Planning (MSIP), and the nation's telecoms providers to cut costs for consumers. According to the Korea Times, the MSIP yesterday met with executives from SK Telecom, KT Corp and LG Uplus to discuss how they might meet demands from the State Affairs Planning Advisory Committee; earlier this week the

committee had delivered an ultimatum to the ministry, demanding that it put forward a plan to cut household telecom expenses by 9 June. Commenting on the matter, Choi Min-hee, a member of the advisory committee's economic division, said: 'The presidential pledge aims at scrapping basic rates for telecom services for the underprivileged and people in the low-income bracket ... We have decided to make the ministry report on how it will carry out the presidential campaign

pledge on reducing household telecom expenses, which will be thoroughly reviewed by the second vice minister.' For its part, the MSIP is said to be somewhat unsure about the new administration's drive to scrap basic telecom rates, citing a lack of legal backing to force operators to do so. Operators, meanwhile, have argued that it will be difficult to reduce or discontinue charges in such a short period of time.

Canadian Operators Face Government Price Pressure

Canada's innovation minister said the government is targeting reductions in the price of the country's wireless services, greater competition and improved coverage in rural areas. In a speech at the Canadian Telecom Summit, the country's Minister for Innovation, Science and Economic Development, Navdeep Bains said the government would encourage competition and investment in the mobile sector to address rising prices. As part of its initiative, the government will work alongside regulator the Canadian Radio-television and Telecommunications Commission to assess widening the scope of Wi-Fi based services in a bid to open the door for lower-cost providers. To improve coverage, a consultation into 5G

was launched, alongside new legislation to encourage satellite services to serve rural and remote communities. "These services are no longer luxuries," Bains said, adding: "They are basic tools for all Canadians regardless of where they live. They need these services to do their jobs, conduct business, learn new skills and build communities." "Our government is prepared to work with this country's telecom providers to ensure that Canadians have access to the services that allow them to compete in a global and digital economy." The initiatives are the latest attempt by Canada's authorities to increase competition and reduce prices for consumers. Bell, Telus and Rogers dominate the country's wireless sector.

According to GSMA Intelligence Q1 2017 estimates, the three players have an 88 per cent market share between them, with the remainder divided between a range of specialist rural and regional operators. When the country's Competition Bureau approved Bell's acquisition of regional player Manitoba Telecom Services in February, it warned any further consolidation would face close scrutiny. It also placed a number of conditions on the deal to encourage competition. The competition regulator stated: "As a result of coordinated behavior among Bell, Telus and Rogers, mobile wireless prices in Canada are higher in regions where Bell, Telus and Rogers do not face competition from a strong regional competitor."

WOM Inks New National Roaming Deals with Entel, Movistar

Chilean mobile provider WOM has negotiated an extension to a roaming agreement that allowed it to utilize the network of rival operator Entel Chile – including its 700MHz LTE system – to offer its services in areas not covered by its own network. According to Wayerless.com, the new deal was signed at the eleventh hour, following a number of extensions to their previous deal, but WOM has complained that the prices set by Entel are too high and reiterated its call for the regulator to reallocate the frequencies in the 700MHz band. La Tercera writes, meanwhile, that in mid-2011 WOM (then known as Nextel Chile) had signed a national roaming agreement with Entel to help improve its coverage as it entered the wireless market. Following a change of ownership at the cellco in January 2015, in September that year WOM inked a new agreement with Claro with the intention of ending its deal with Entel by the end 2015. In the event, however, the pact remained in place throughout 2016 and was due to expire earlier this year, but a temporary extension was agreed by the two players until 31 May, with a more permanent deal only being reached at the end of May. Whilst neither party can confirm details of the agreement due to its confidentiality,

sources close to WOM claimed that it had been compelled to reach an agreement with Entel, despite the reportedly high price set by the cellco, as large numbers of WOM's customers would be affected should the pair end their partnership. On that basis, WOM had sought intervention from the regulator on the matter, though it remains unclear what impact the watchdog's involvement had. Indeed, a

out in the controversial 700MHz auction. In a related development, WOM inked a roaming agreement with the nation's other mobile network operator, Spanish-owned Movistar Chile, earlier this month. As such, WOM now has access to the mobile networks of all three of its larger rivals. In statement, WOM said of the deal: 'WOM is focused on continuing to deploy its own network throughout Chile, but



senior Entel official told the press that the matter did not require negotiation, as Entel had openly offered roaming agreements to providers that had missed

also has roaming partners to serve more Chileans.'

Telenor Norway Must Cut Wholesale Mobile Network Prices

Norwegian Electronic Communications Regulator Nkom said that Telenor

Norway must reduce its wholesale prices for operators which to lease capacity

on its mobile network. The aim is to improve the conditions for a competitive market by enabling smaller players to compete. Every six months, Nkom runs a margin squeeze test of Telenor's current products.



Finnish Cellcos Seeking Exemption from Impending Requirement to End Roaming Surcharges

Finland's mobile network operators (MNOs) – Elisa, Telia Finland and DNA Finland – have all reportedly asked to be exempted from having to do away with retail roaming surcharges as required by recent ruling by the European Parliament. According to local press outlet YLE, the trio have lodged requests with the Finnish Communications Regulatory Authority (FICORA) asking for a one-year exemption from having to eliminate EU-wide roaming charges, arguing the new system will mean lost revenues and increased prices for consumers that do not use their handsets outside of

Finland. Finnish European MP Miapetra Kumpula-Natri was cited as saying that in order to be granted such an exemption, each operator will have to prove that implement the changes required would lead to a more than 3% drop in turnover. A decision regarding the matter is not expected until at least this middle of this month, however, with FICORA deputy-director Petri Makkonen noting that the regulator is unable to take any action until the rules come into effect. As previously reported by CommsUpdate, in April 2017 the European Parliament confirmed that an informal deal on wholesale price caps

had been endorsed, as a result of which the abolition of retail roaming surcharges is now expected from 15 June 2017. At that same date the European Commission (EC) confirmed plans to introduce caps on wholesale roaming prices, those being: EUR0.03 (USD0.03) per minute for voice calls, a 36% drop from the current level; EUR0.01 per text message (down 50%); and EUR7.7 per GB of data (down 85%). Looking further ahead, it was also confirmed that the cap for data will gradually decrease, to EUR2.5 per GB by 2022.

TECHNOLOGY NEWS

Evolved Intelligence Sends Warning Signal Over 5G Security

Telcos are racing to deploy 5G networks without paying due consideration to securing signaling networks, warned Evolved Intelligence. South Korea aims to have pre-standard 5G networks up and running in time for the 2018 Winter Olympics, while Japan has similar ambitions for the 2020 Summer Olympics. "I understand the commercial targeting of big events for new technology, but it will put the operators in a vulnerable position if they launch 5G networks without the right level of security," said Peter Blackie, co-founder and commercial director of Evolved Intelligence. It is worth noting

that Evolved Intelligence sells firewalls for signaling networks, so it is in the company's commercial interest to draw attention to security weaknesses in said networks. That said, security problems with the Signaling System 7 (SS7) protocol, used to interconnect 2G and 3G mobile networks, were laid bare in May, when O2 Germany revealed that attackers were able to intercept two-factor (2FA) authentication codes sent in text messages to banking customers. This allowed the attackers to withdraw funds from the victims' accounts. 5G networks won't use SS7, but will instead use the

Diameter signaling protocol, which handles signaling messages carried over IP-based networks. According to Blackie, Diameter also has similar security issues to SS7. "The technology underpinning Diameter will be more familiar to IT and computer hackers than the telecoms technology used in SS7," he warned. He said it is vital that the industry ensures "that signaling security in 4G and 5G networks gets the attention it requires, and that we do not repeat the mistakes of the past."

SK Telecom Demos 5G Trial Network Using 3.5Hz Spectrum

South Korea's SK Telecom (SKT) has announced that, through collaborations with Samsung Electronics and Nokia, it has successfully demonstrated 5G communications using the 3.5GHz band – a first for the country. Outlining details of the development, SKT said it had worked with Samsung Electronics to develop a 3.5GHz 5G end-to-end network- comprised of 5G virtualized core, virtualized RAN, Distributed Unit (baseband unit and radio unit) and test device, with this based on the 3GPP 5G New Radio (5G NR) standards elements established to date. A trial of this infrastructure was then carried out at Samsung Electronics' R&D Center in Suwon. Meanwhile, with regards to its collaboration with Nokia, SKT revealed it had collaborated on the development of 5G base station equipment and test devices in the 3.5GHz band, while successfully realizing Gbps-level throughput during a field trial held near its Bonding Office Building, through the application of carrier aggregation (CA) techniques to expand bandwidth. Following its successful trials of 3.5GHz 5G infrastructure, SKT now claims to have secured 'all essential technologies to deploy 5G networks using above-



6GHz and below-6GHz frequencies'. The operator has confirmed it plans to roll out its 5G networks by leveraging the respective strengths of 3.5GHz and 28GHz frequencies, with it aiming to deploy commercial 5G networks using the latter band in downtown areas where data traffic is most concentrated, while covering wide areas using 3.5GHz spectrum, or a combination of 3.5GHz and 28GHz. With a view to securing key 5G

technologies for early commercialization of 5G networks in the 3.5GHz band, meanwhile, SKT has said it will continue to work with Samsung Electronics and Nokia to further enhance transmission speeds, expand coverage and improve communication stability while on the move.

Du Hits 700Mbps Using Single Carrier in Massive MIMO Trial



United Arab Emirates (UAE) fixed and mobile operator Du says it has achieved download speeds of more than 700Mbps in tests of Massive MIMO (multiple-input, multiple-output) technology on its commercial network. The trial used a single carrier channel of 20MHz, while Du also said that trials using three 20MHz carrier channels achieved download rates of more than 2.1Gbps. Saleem Al Blooshi, executive VP for infrastructure and technology at Du, commented: 'As we look to the future, our consumers' expectations will only increase, as the amount of information exchanged proliferates – and 5G will offer the instant data transfer. We are preparing for this future by trialing new ways to get the most from our available spectrum and increasing capacity.'

Vodafone Turkey Tests 700MHz LTE with Eye on 5G

Vodafone Turkey has announced on its website that it is the first operator in the country to test the 700MHz band using its existing commercial 4G/4.5G LTE network. Vodafone partnered Huawei

Technologies and TechCity Istanbul for the project, using 700MHz frequencies which are earmarked for transferal from television broadcast services to mobile broadband usage. Vodafone says that the

700MHz spectrum is of great importance for upcoming 5G network technology in terms of achieving wide national coverage.

Ericsson Calls for Strict IoT Security Measures

Mats Nilsson, Ericsson's director of group function strategy and technology (pictured), suggested operators could adopt stricter rules and bar devices with low security from operating on their networks, amid the growing IoT security threat. Nilsson told Mobile World Live the industry had to see "some form of certifications", particularly for IoT devices used in more critical infrastructure. However, he pointed out the network itself was also a "critical infrastructure" and therefore any connected device posed a threat and security requirements should be stepped up. "We believe there will be a need for meshes to ensure the basic security for IoT, and that can be done through different market actors, or even for the operators to take more responsibility" on what devices they admit, he said. Operators could adopt "stricter rules not to admit low security products on the network, or if there is need for regulation, that remains to be seen." With consumer data now being used increasingly by big enterprises, a trend set to increase with 5G and IoT, Nilsson said operators' are increasingly looking at opportunities in this segment. However, such a strategy comes with a unique set



of security challenges. "Operators see that smartphones and tablets offering media to subscribers is slowly getting saturated, and the new business revenue lies in the enterprise segment. This means a far more complicated ecosystem," he warned.

Turkcell, Huawei Claim First 5G mmWave Test, Hitting Speeds of 70Gbps

Turkey's Turkcell and Chinese vendor Huawei have reported carrying out 'the first' successful 5G millimeter-Wave (mmWave) network speed test, claiming

a new network speed record in Turkey of 70Gbps. Turkcell's deputy director of network technologies, Gediz Sezgin, called the test result 'a breakthrough

in telecommunications', with the cellco having previously (in January) noted a 5G peak speed of 24.7Gbps in tests with Sweden's Ericsson.

Spreadtrum Plans to Launch 5G Chip

Spreadtrum Communications has assigned hundreds of staff to accelerate R&D of 5G chips, according to company ATP VP Yi Kang. Spreadtrum has developed a second version of its 5G prototype chips for greater bandwidth, Kang disclosed. The company expects to roll out its 5G solutions as early as the second half of 2018. Spreadtrum has been working with telecom equipment suppliers Huawei, Ericsson and ZTE to conduct 5G trials, Kang indicated. Spreadtrum is also collaborating with a number of mobile operators, such as China

Mobile, and instrument manufacturers and academies in the 5G field, Kang said. With China Mobile, Spreadtrum is already involved in the telecom carrier's 5G trial networks in several cities, Kang noted. Before 3GPP standardizes the first version of 5G technology, Spreadtrum is looking to roll out its first 5G commercial chip and enter production of the chips as early as possible. The baseband chip of Spreadtrum's 5G commercial chip solution will be fabricated using TSMC's 12nm process technology, while the radio-frequency (RF) chip will be built

using 28nm process technology, Kang said. Both the baseband and RF chips are still in development. Spreadtrum fell behind its bigger international rivals in the development of 2G, 3G and 4G chip technologies. However, Spreadtrum is looking to keep up with the world's leading technology in the 5G field, Kang said. Spreadtrum is pursuing an opportunity to catch up with Qualcomm in the development of 5G chips, Kang indicated.

ZTE Achieves 2.1Gbps Data Rate in 3D-MIMO Trial

ZTE has announced it has achieved a record high peak data rate of 2.1Gbps over a commercial deployment of pre5G massive multiple input multiple output (MIMO) in Quanzhou. The deployment of pre5G massive MIMO (or 3D-MIMO) technology for China Mobile's Quanzhou branch Quanzhou Mobile in big video environments verified the peak cell rate for the technology. With 16 commercial terminals connected, single carrier downlink peak cell rate reached 730Mbps,

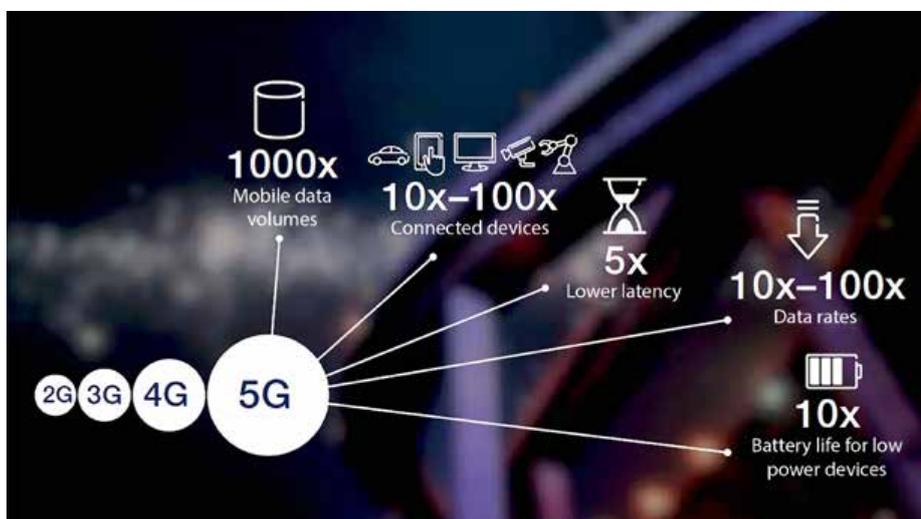
while three-carrier 16-stream downlink reached 2.1Gbps. ZTE said that by using massive MIMO on the same bandwidth, 3D-MIMO base stations can achieve a peak throughput seven times higher than existing 4G macro stations. ZTE and China Mobile have been investing in development and verification of 3D-MIMO technology since 2015, and last year conducted pre-commercial verification in 50 cities across 29 provinces. Separately, China Mobile Shanghai and the China

Mobile Research Institute have teamed up with Huawei to conduct a 5G field trial to verify 5G high band and low band coordination technology. The testing demonstrated an average user data rate of up to 1.7Gbps using 200-MHz of low-frequency spectrum, while 5G dual connectivity can achieve a single user peak throughput of 18Gbps. Huawei and China Mobile also plan to test applications for 5G in automotive networks, such as tele-operated driving.

Telekom Romania, Ericsson Conduct 5G Test

Telekom Romania has conducted a test of 5G technologies in conjunction with Swedish vendor Ericsson, writes The Diplomat. The two companies

held a 5G demonstration in the capital city Bucharest this week, presenting the new technology to the media and state officials. In the demonstration, which included tests of beamforming, aggregate speeds of up to 24Gbps were achieved. Commenting on the tests, Arun Bansal, SVP and Head of Ericsson in Europe and Latin America said: 'Today's demonstration, the first of its kind in South Eastern Europe, provides a glimpse into the future and how 5G will enable people, industries and things to connect on an unprecedented scale, bringing with it a whole new world of devices and services.' The Romanian government is reportedly aiming to award companies 5G licenses in 2018, ahead of commercial deployments, which are expected in 2020.



Wireless Carriers Plan to Fire Up 5G Networks

The Wireless carriers are preparing to leap to fifth-generation network technology, providing a speed boost that could change everything from the way we watch sports to how we undergo surgery. The new technology will enable communications speeds up to 100 times faster than current 4G technology. Global 5G standards could be finalized by the end of this year, and the development of compatible devices is expected to take about a year. Japan's big three carriers -- NTT Docomo, KDDI and SoftBank Group -- aim to have 5G connectivity available in parts of Tokyo and other limited areas in time for the 2020 Olympics. They are expected to shell out a combined 5 trillion yen (\$45.1 billion) to set up the networks. "We will offer 5G in key regions across

Japan in the first three years," Docomo CEO Kazuhiro Yoshizawa said, declaring the company's intention to offer nationwide coverage by the fiscal year that starts in April 2023. Carriers in other countries are making similar moves. U.S. giant Verizon Communications aims to roll out its 5G network early next year. China Mobile plans to boost investment in the 2019-2020 period, looking to commercialize the new network in 2020. South Korea's KT is set to offer 5G-capable technology on a trial basis next year. The potential is huge. Switching on the mobile afterburners will allow self-driving cars to communicate with each other in just 0.001 second, significantly reducing the chances of accidents. The virtually instantaneous transmissions could also allow doctors

to operate on patients remotely. In the industrial sector, better internet-of-things connectivity promises to improve productivity in factories and other settings. Media organizations cannot wait to get hooked up. Some are working on technology that will enable viewers to watch live sports from a desired angle by switching between video feeds from multiple cameras. Mobile streaming of ultrahigh-resolution 8K video is also on the way. NTT Docomo on May 22 held a 5G demonstration at Tokyo Skytree, the world's tallest self-supporting tower. A screen placed on the ground floor showed a live image relayed wirelessly from an 8K-resolution camera on the observation deck 350 meters above -- a world first.

Quantify Technology at Forefront of IOT Industry

Quantify Technology Holdings informed the market that it had successfully developed and released for manufacture its passive infra-red motion sensor fascia to complement its growing suite of products. The new technology incorporates passive infra-red motion, light measurement, temperature, and humidity sensor. The new fascia also allows QFY's platform to manage power usage by collecting and analyzing data and reacting to the environment. The modular design allows for easy upgrades and add-ons that are being developed. The new technology is expected to be installed in the University of Western Australia Medical and Dental Library project in the third quarter with manufacture of the product currently underway. Further to this development, a luxury apartment on York Street in Sydney will have QFY's Q Device installed, which will be used to showcase the company's Truly Intelligent Building Solution to potential clients across the globe. It should be noted here that this is an early stage play and investors should seek professional financial advice if considering this stock for their portfolio. The demonstration suite will initially be commissioned with QFY's first feature

set demonstrating power management. The demonstration suite will evolve with technological upgrades and add-ons as they are developed. QFY will program and test the demonstration suite over the next few weeks, with work scheduled to be completed by the end of the month with management planning to show clients and stakeholders through the apartment in early July 2017. Commenting on the release of this latest technology, QFY's founder and Managing Director, Mark Lapins, said, "The development of this latest fascia shows the ease with which new technology and feature upgrades may be incorporated with our hardware -- a key feature of our modular platform". Lapins said the flexibility of QFY's

modular design was significant in that it allows for easy integration of sensors and devices in the company's products via the user interchangeable fascia. This design allows the company and its customers to stay at the forefront of future technological advancements. Further important developments may be on the horizon with Lapins saying, "Additional innovative sensors and devices are being evaluated for integration in future products and we look forward to updating the market when complete". Lapins highlighted the fact that QFY is at the forefront of the emerging IoT (Internet of things) industry, and technology upgrades such as fascia development would help the company in maintaining a dominant position.



ZTE Completes 26GHz High-Frequency Field Test in Beijing

ZTE claims to have become the first vendor to carry out a 26GHz high-frequency field test as part of the second phase of China's 5G trials which are being conducted in the Huairou district of Beijing. Announcing the development, the vendor said the test of its 5G new radio (NR) pre-commercial base station had delivered 'an excellent performance in interconnecting with the instruments and

chips from a number of manufacturers in the industry'. Meanwhile, ZTE also confirmed that it has now applied for permission to carry out official tests for the frequency bands greater than 40GHz at its Shanghai R&D center. As previously reported by CommsUpdate, a series of 5G tests are being conducted in China under the auspices of the IMT-2020 (5G) Promotion Group, which is

jointly led by the Ministry of Industry and Information Technology (MIIT), the National Development and Reform Commission (NDRC) and the Ministry of Science and Technology (MOST). The test group itself involves, among others, the China Academy of Information and Communications Technology (CAICT), China Mobile, China Telecom and China Unicom.

Chinese Telcos to Plough \$180bn into 5G

Combined outlay on next-gen mobile tech to reportedly be 48% greater compared to 4G. China's three mobile network operators will spend a combined \$180 billion on 5G infrastructure over the coming seven years. This is according to a South China Morning Post report citing Jefferies equity analyst Edison Lee, who said the outlay will eclipse by 48% the \$117 billion cumulative investment that China Mobile, China Unicom, and China Telecom made in 4G. It is also nearly four times the amount that China's biggest regional rival, Japan, plans to spend on

5G – approximately \$46 billion – over the same period, Lee said. The higher capital spending will be driven by the use of higher-frequency spectrum bands, necessitating the deployment of a more base stations, and the push to reach nationwide coverage, a feat China Mobile is expected to achieve by 2021. Jefferies is particularly bullish on subscriber numbers, predicting 588.3 million 5G subscriptions in mainland China alone by 2022. By comparison, Ericsson expects the number of 5G subscriptions to reach 550 million worldwide by the same year.

"Major Chinese Internet companies, Baidu, Alibaba Group and Tencent Holdings, will lead the way in introducing advanced consumer services based on 4K and 8K video, as well as augmented and virtual reality technologies, on the new 5G networks," Lee said in Monday's SCMP report. "Smart city initiatives will take advantage of the 5G networks to make use of artificial intelligence for public security, traffic management and disaster management."

Ericsson Tips LTE for Wireless Dominance From 2018

LTE will become the dominant access technology in the world during 2018 overtaking GSM and 3G for the first time, Ericsson forecast in the latest edition of its Mobility Report. According to predictions from the June edition of Ericsson's regular industry report, there will be around 2.6 billion LTE subscriptions by the end of 2018, ahead of the 1.9 billion GSM/EDGE-only and 2.4 billion 3G connections. By the end of 2022, Ericsson expects this number to reach 5 billion LTE subscriptions around the world, seven times greater than those using GSM/EDGE and four times higher than those relying primarily on 3G. The report covers connection trends and predictions for the next five years. It highlighted the continued growth of LTE in developed and developing markets as key drivers for the industry, alongside increased data usage from the continued

popularity of mobile video. During 2016, worldwide monthly data usage was 8.8 exabytes, with half of this figure attributed to mobile video usage. In 2022, Ericsson believes this will increase to 71 exabytes, with the proportion of mobile video reaching three quarters. With commercial 5G deployments widely expected to begin in 2020, Ericsson includes the technology in the last two years of its projection. By the end of 2022 it expects the technology to be available in markets covering 15 per cent of the world's population. Excluding IoT, Ericsson forecasts 5G subscriptions will reach 500 million by the end of 2022. IoT, it believes, will account for 18 billion devices across all access technologies by this date, roughly in line with predictions made in its June 2016 report. The far reaching study revealed an average of 1 million new mobile data connections will be created worldwide per day to the

end of 2022. This will take total mobile broadband connections to 8.3 billion, across 5.8 billion unique subscribers. Ericsson said this growth would be due to: "a growing young population with increasing digital skills, decreasing smartphone prices as well as continued development of 3G and 4G mobile broadband technologies in developing markets."



Mobile Industry Hits 5B Subscriber Milestone

Some 5 billion unique subscribers are now connected to a mobile service worldwide, representing two-thirds of the global population, according to real time data from GSMA Intelligence. In a statement, Mats Granryd, director general of trade group GSMA, hailed the milestone as a "tremendous achievement for an industry that is only a few decades old" and said it reflected the billions of dollars spent by mobile operators on networks, services and spectrum through the years. "Today mobile is a truly global platform, delivering connectivity and, perhaps more importantly, social and economic opportunities to citizens in all corners of the world," he said. GSMA Intelligence said it took four years to add the latest 1 billion subscribers, with more than half (55 per cent) of mobile subscribers now based in the Asia-Pacific region. China is the world's largest mobile market accounting for more than 1 billion of the world's subscribers, with India the second largest on 730 million. India is tipped to account for the largest share of growth by the end of the decade, with GSMA Intelligence predicting the country will generate around

30 per cent of new unique subscribers by 2020. Europe, meanwhile, is the highest penetrated region of the world today, where 86 per cent of citizens subscribe to a mobile service. The region's unique mobile subscriber base stands at 465 million. At the other end of the spectrum, Africa is the least penetrated region, with 44 per cent of the population and 436 million unique subscribers. Overall, unique global mobile subscribers will increase to

5.7 billion by the end of the decade, representing almost 75 per cent of the world population, according to the GSMA Intelligence forecast. Granryd added future subscriber growth opportunities will be focused on connecting "rural, low income populations", while mature markets will see an evolution to capture new opportunities and provide "the platform for a new digital world as we enter the 5G era".



BT Unveils Raft of Technology Developments

British fixed line incumbent BT has made a number of announcements as part of its 'Aadal Park Innovation Week', which got underway on Monday and runs until the end of this week. In the first of these, BT said that its network arm Openreach had showcased the 'fastest ever consumer broadband', having carried out a live demonstration of a 100Gbps, or 'hyperfast', broadband service at BT's R&D center at Aadal Park. The demo utilized a standard residential fiber-to-the-premises (FTTP) connection coupled with advanced transmission technology developed in partnership with China's Huawei Technologies. BT noted that the test equipment was designed to replicate a fiber connection in a real-life setting with a single fiber carrying a 100G signal from exchange equipment and carried over standard technology used in Openreach's existing FTTP infrastructure. Meanwhile, again

working with Huawei, BT revealed that its research team has developed a new 400Gbps single-carrier based technology solution capable of transmitting data over core fiber-optic networks. Trials of this technology – which were conducted over a distance of 250km using a live fiber-optic loop between Aadal Park and BT's Bishops Stortford Exchange – build on the telco's previously demonstrated 'Superchannel' concept, which last year achieved downlink speeds of 5.6Tbps by combining 200Gbps wavelengths of light into a single optical fiber. By combining multiple 400Gbps wavelengths over a single fiber, the telco says it is confident that speeds of more than 13Tbps can be achieved using the same amount of light spectrum as in the earlier Superchannel demo. Finally, in the mobile arena BT subsidiary EE claims to have become the first British mobile network operator (MNO) to showcase 'pre-standard 5G'

backhaul capability, using it to connect its 'air mast' mobile coverage solution. Known as 'Helikite', the platform uses mini mobile sites attached to a helium balloon to provide 4G mobile coverage where permanent sites have been damaged or in areas where there is no coverage. In the technology trial, EE employed pre-standard 5G backhaul technology using millimeter wave (mmWave) frequencies, with the mobile backhaul solution demonstration utilizing 26GHz test spectrum to connect the Parallel Wireless small cell on the Helikite to an Athonet virtualized Evolved Packet Core (EPC) on the ground using a PHAZR link. According to EE, the addition of pre-5G backhaul not only boosted 4G speeds, but also lowered latency, allowing for an increased number of people that the air mast could keep connected.

Nokia calls for Europe to step up on 5G

Hossein Moiin, Nokia Mobile Networks CTO, confessed he is pessimistic about Europe's chances of emerging as a 5G leader, insisting the continent will be left behind unless sweeping changes are made at regulatory level. In a frank exchange at a 5G press briefing in London, Moiin said the US regulator Federal Communications Commission was "more enlightened" than counterparts the European Commission (EC), as he tipped the US to lead initial 5G deployment, with South Korea and Japan following with mobile use cases. "I'm not optimistic about Europe to be honest," he said: "It's kind of sad because Europe is traditionally the leader in developing technology, and it will also be this time because Nokia and Ericsson are European companies. But in terms of deployment, in terms of regulation, in terms of operator profitability and operators taking risks, these are non-technical issues, but Europe seems to be left behind." He noted the EC and the

European Union had set "high ambitions" for 5G, but this was not being translated into policies which are investor friendly. To ensure a better European playing field, Moiin suggested M&A should be allowed across borders to create "four or five strong operators". "Europe is roughly the same size as the US in terms of customers, but there are 70 operators here compared to four in the US, and even one of them is quite sick. Three operators there can do things and invest." (The sickly operator comment is presumed to be a reference to Sprint, which lost out to T-Mobile in terms of subscriber numbers in recent years and could now be merged with its rival). Moiin's comments on 5G come after a group of cross industry associations last week slammed the EU's regulatory approach to 5G, which they said did little to improve the continent's prospects for the technology. Speaking about Nokia's own opportunity, Moiin said the likely uptick from 5G would

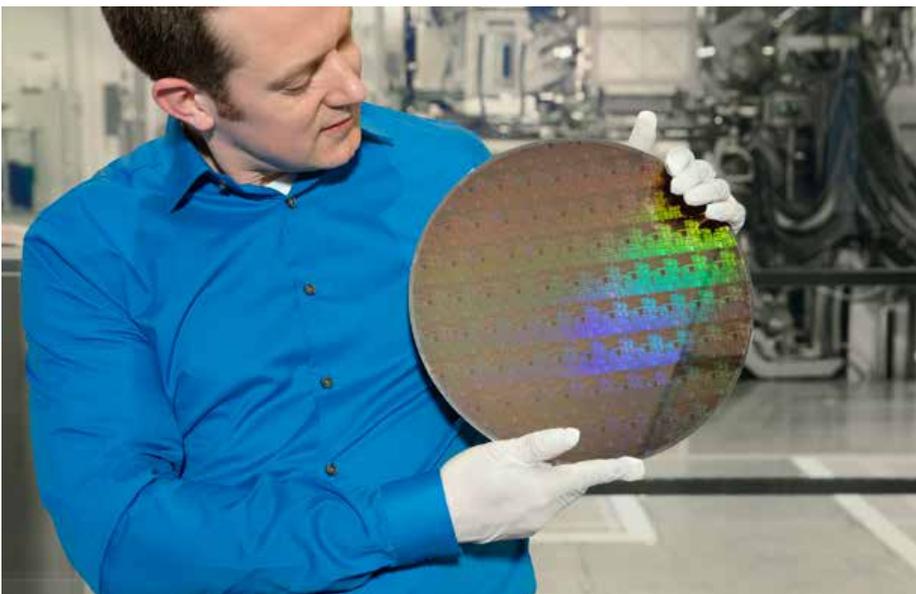
present itself gradually, with operators expected to increase their spending over time. "As the use cases grow and other industries decide to become digital and fully networked in the way they operate, we will see the investment pouring in." Moiin added everything was "beginning to shape up" for the Finnish vendor and it is "exactly where we should be" with its 5G plans. He predicted most of the standardization for 5G should be completed by end-2017, with a first draft expected by November, which will then be finalized in 2018. At the 5G World Summit in London, Nokia announced it will hold demos of its AirScale radio portfolio. In a statement, the Finnish vendor said it will showcase how AirScale can leverage Nokia's Flexi RF units, which are already deployed by operators: "ensuring that their existing investment in radio technology is protected, while preparing them for the path to 5G".

IBM Unveils World's First 5nm Chip

IBM unveils world's first 5nm chip. IBM, working with Samsung and GlobalFoundries, has revealed the world's first 5nm silicon chip. The 5nm IBM chip is prominent in using horizontal gate-all-

around (GAA) transistors and extreme ultraviolet (EUV) lithography. It will provide better performance, better power management and increased density using smaller transistors. GAAFET is

developed part of tri-gate finFETs that can be used for most 22nm and below chip designs. But it will possibly run out of condensation at around 7nm. GAAFETs may go all the way down to 3nm, especially when combined with EUV. The main focus was on decreasing the size for increasing the power on a 2D plane, so finFETs solved the problem by creating 3D plane. Somewhat than use of current FinFET architecture, IBM has been exploring stacked nanosheet transistors, assisted by a technique that allows it to adjust the chip's design for improved power and performance in ways that FinFET can't. In the final analysis, IBM has created a GAAFET model with a new chip that allows for consistency, better performance, and can even be further scaled down to fit into smaller spaces. The main advantage is that chip can further be trimmed down into smaller size. IBM 5nm chip size is the most ideal size for the finest performance.



China Opens Consultation on mmWave Band for 5G

China's Ministry of Industry and Information Technology (MIIT) launched an open consultation on the use of millimeter wave (mmWave) spectrum for the development of 5G networks. With mmWave spectrum expected to play an important role in future 5G networks, the MIIT is asking for input on the planned

use of the 24.75GHz to 27.5GHz, 37GHz to 42.5GHz and other mmWave bands, C114.net reported. The consultation is open until 7 August. MIIT said in early June China plans to deploy 5G in the 3.3GHz to 3.6GHz and 4.8GHz to 5GHz bands. China's government is taking early steps in its frequency planning

to help speed the development of IMT-2020 (5G) in China. The country plans to start second phase 5G network tests at 30 sites this year and conduct large scale networking tests next year. The first 5G services are expected in 2020 at the earliest.

Turkcell Tests Massive MIMO on Live Network in Preparation for 5G

Turkey's Turkcell claims to be the 'first in Europe and Central Asia' to test Massive MIMO technology on a live network, as part of its preparations for 5G network readiness. A press release says that, in partnership with Huawei, Turkcell completed the first 'real network' Massive MIMO implementation using the 1800MHz FDD frequency band in Antalya, Turkey,

with test results showing that 480Mbps cell throughput could be achieved by using eight commercial test terminals on 20MHz spectrum with live network traffic. Cell throughput increased more than five times compared to the same live network test area using 'traditional' LTE 4x4 MIMO configuration. Turkcell notes that it previously demonstrated TDD Massive

MIMO technology in the Turkish capital Ankara with a six-fold increase in cell throughput. Turkcell adds that Massive MIMO offers significant advantages in high speed mobile broadband provision, especially in dense usage areas with a large number of people connecting at the same time (e.g. shopping centers, hotels, concert halls etc.).

Global IP Traffic to Hit 3.3 Zettabytes by 2021

Networking giant's latest Visual Networking Index predicts video to account for 82% of traffic. Global IP traffic will triple between 2016 and 2021 to reach 3.3 zettabytes per year, according to Cisco's 12th annual Visual Networking Index (VNI). That compares to 1.2 zettabytes – equivalent to 1.2 trillion gigabytes – in 2016, Cisco said. A number of trends are expected to drive the increase, including growth in the number of Internet users, and the number of connected personal and machine-to-machine (M2M) devices. Ongoing adoption of online video and music streaming, and gaming, is also expected to drive traffic volume. By 2021, Cisco expects the number of Internet users to reach 4.6 billion, up from 3.3 billion in 2016. Connected devices will increase from 17.1 billion to 27.1 billion, with M2M connections accounting for more than half of that total. Unsurprisingly, video traffic will dominate, accounting for 80% of all Internet traffic by 2021, up from 67% in 2016. "Globally, there will be nearly 1.9 billion Internet video users (excluding mobile-only) by 2021, up from 1.4 billion in 2016," Cisco said. By the end of the

forecast period, the world will watch 3 trillion minutes of video per month. In terms of fixed versus wireless, WiFi and mobile-connected devices will generate 73% of Internet traffic by 2021, compared to 27% for fixed. In 2016, that split stood at 62% wireless versus 38% fixed. On a geographic basis, Cisco expects Asia-Pacific to account for the lion's share of global IP traffic by 2021, generating 107.7 exa-

bytes per month, ahead of North America with 85 exabytes per month. Western Europe is expected to be the third-largest region, generating 37.4 exabytes per month, while Central Europe and Latin America are expected to generate 17.1 exabytes and 12.9 exabytes respectively per month. Finally, the Middle East and Africa are expected to generate 15.5 exabytes per month by 2021.



Japanese Cellcos to Sink USD46bn into Delivering Nationwide 5G Coverage in 2023

Nikkei Asia Review writes that Japan's incumbent mobile network operators (MNOs) – NTT DOCOMO, SoftBank and KDDI (au) – intend to invest a combined JPY5 trillion (USD45.7 billion) into 5G technology, with one going so far as to target nationwide coverage in 2023. With the three carriers intent on launching new generation services commercially in 2020, the anticipated surge in interest for IoT and self-drive cars etc. is expected to help fuel the boom in spending. The first

live 5G networks are expected to come onstream in parts of Tokyo and other select areas ahead of the 2020 Tokyo Olympics and Paralympics, but DOCOMO chief executive Kazuhiro Yoshizawa is quoted as saying national coverage will be a reality in fiscal 2023, adding: 'We will offer 5G at key regions across Japan in the first three years'. Global standards for 5G could become reality by end-2017 and the Japanese MNOs expect to begin investing in base stations and equipment

in fiscal 2019, the paper claims – noting too that DOCOMO, KDDI and SoftBank spent over JPY6 trillion between them installing the current 4G LTE network. The implementation of 5G in their networks is expected to cost less because they will be able to convert some of the 4G stations they operate across the country. Furthermore, DOCOMO has suggested sharing 5G base stations with its two rivals to trim costs, particularly focusing efforts in urban areas.

Telkomsel, Huawei Demo 5G in Jakarta

Telekomunikasi Selular (Telkomsel) and Chinese equipment manufacturer Huawei yesterday (29 May) held a live demo of 5G technology in Jakarta, which they claim is capable of producing data speeds of up to 70Gbps. Telkomsel Vice President of Next Generation Network services, I Ivan C Permana, commented: 'We will continue to analyse and review 5G thoroughly in the future to become the first operator in Indonesia to deploy 5G services commercially, as we have done on 4G technology,' while his colleague Indra Mardiatna confirmed that the demo was designed to focus on three expected characteristics of the new generation platform, namely Enhanced Mobile Broadband (eMBB), Massive Machine Type Communications (mMTC) and Ultra-reliable, and Low Latency Communications (uRLLC). Meanwhile,

Director of Wireless Network Solutions, Huawei, Li Fei, added: 'Huawei is a very active contributor to the standardization and development of 5G. We will continue

to bring the latest and most relevant technology to Indonesia and help our partners Telkomsel to maintain their leadership in technology and innovation.'



5G Group Finalizes Plans for 30-Site 5G Test Field

China's IMT-2020 (5G) Promotion Group – a platform for the promotion of 5G research and development, jointly led by



the Ministry of Industry and Information Technology (MIIT), the National Development and Reform Commission (NDRC) and the Ministry of Science and Technology (MOST) – has finalized plans for a 30-site 5G test field in the Huairou district of Beijing, RCR Wireless writes, citing the group's vice chair, Wang Zhiqin. Alongside China's mobile providers, Huawei, ZTE, Ericsson, Nokia, Datang and Samsung are taking part in the field tests, whilst chipset and test

instrument vendors such as Qualcomm, Intel and Rohde and Schwarz have also been invited to join the trials. The official also noted that the group had completed the initial phase of its trial programme in 2016, having completed tests of a range of technologies including massive multiple-input, multiple-output (Massive MIMO), new waveforms, advanced coding, ultra-dense network implementation, high frequency communications, network slicing and edge computing.

Jazz competes VoLTE test with Huawei and Nokia

Jazz has successfully tested its VoLTE technology, a press statement claimed. Jazz carried out this test amalgamating with its partners Huawei and Nokia. According to the press statement, the VoLTE technology will soon be available to Jazz users. Pakistan is the second largest market for this VEON subsidiary. Jazz took the Pakistani market by storm when it announced a merger with another

telecommunication brand Warid. In the aftermath of the merger, the company has as much as 50 million subscribers. And now it is all set to shake the local market even further. Khalid Shehzad, Chief Technology Officer – Jazz, said, "Providing impeccable voice and data experience to Jazz customers is our continuous endeavor and we are humbled to be the first in Pakistan to conduct

successful VoLTE trial using the latest technology. Once we move towards the commercial launch, VoLTE shall enable our valuable customers to enjoy premium voice services with more than 80% reduction in call setup time, and on top of that it can cherish the true essence of data session during call".

Atresmedia Offers OTT App for Apple TV

Atresplayer's launch for Apple TV strengthens its leading position among content distribution platforms across several devices and systems," stated the media group. Since launched in 2013, the streaming and video-on-demand (VOD) service has gradually launched across most popular operating systems and platforms, including Android, iOS and Windows mobile devices, some smart TV

models, game consoles and Google Chromecast. With 9.5 million downloads of its app, Atresplayer is also the preferred online content platform for Spaniards, as 46.6% of Internet users have watched content on it, according to the latest figures.



CommAgility Plans 4G and 5G Small Cell Technology

UK-based LTE software and hardware developer CommAgility has licensed its technology to IDY of Japan in a research project to develop 4G and 5G small cells. IDY is licensing CommAgility's SmallCellPHY and SmallCellSTACK software which provide a complete LTE Physical Layer and LTE Protocol Stack for small cell eNodeB products. CommAgility has integrated the software onto its dual channel AMC-K2L-RF2 RF transceiver card which uses the TCI6630K2L KeyStone II DSP/ARM SoC from Texas Instruments. This integrates four C66x+ DSP cores with two ARM CortexTM-A15 cores for higher layer processing. A TI AFE7500 analogue front end provides

flexible RF I/O across the 700MHz to 3GHz band that covers 4G and 5G implementations. CommAgility and IDY are working together, with support from CommAgility's Japanese distributor StarBridge, to deploy the integrated hardware and software in a variety of 4G and 5G research and development programmes. The solution meets the demanding quality requirements for the Japanese market. "CommAgility provides a proven system, with hardware and software integrated and tested. This means we can focus on achieving our R&D goals on the journey towards 5G, as well as offering our customers highly differentiated products," said Kazuaki

Honda, President at IDY in Tokyo. The company makes cellular networking devices for wide area and private narrow band infrastructure for the Internet of Things (IoT). The major product is a machine to machine (M2M) router for railways, power plants and factories. CommAgility, based in Loughborough, UK, is part of the US Wireless Telecom Group that also includes Boonton Electronics, Microlab and Noisecom. The companies provide RF and microwave components, modules, systems and instruments to the wireless, telecommunication, satellite, military, aerospace, semiconductor and medical industries.

Openserve Planning to Roll Out G.fast Technology

Telkom South Africa's wholesale division Openserve is planning to deploy G.fast technology – which is capable of offering theoretical speeds of up to 1Gbps (for distances of less than 100 meters) – in order to upgrade download speeds over its legacy copper network to 100Mbps, TechCentral writes. However, as the DSL protocol is aimed at improving performance over local loops that are shorter

than 500 meters, only a portion of Telkom's DSL base is set to benefit from the rollout. Openserve's CEO Alphonzo Samuels revealed that his company will run a trial of the technology in nine neighborhoods before rolling it out commercially. The company was quoted as saying in a press release: 'We've now have found a way to better make use of infrastructure that is already in place, thus reducing any

disruption or possible harm to the aesthetics of the estate or the associated expense ... A G.fast node will be installed where the fiber extension is terminated and complex residents will now have access to the higher broadband speeds available utilizing the existing copper tail/drop wire.' Currently, Telkom offers download speeds of 40Mbps over its copper infrastructure (utilizing VDSL technology).



ETISALAT DIGITAL

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Etisalat Digital is a business unit of Etisalat designed to transform enterprises and governments into smarter and more advanced entities through the use of the latest digital technologies. It's no longer the big beating the small, but the fast beating the slow, and the smart taking the lead.

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Mustafa AR Al ATEEK,
CEO/Etisalat Services Holding

"Etisalat Services Holding today has established itself as a successful player in the telecom and technology industry. We have strived to invest, innovate and launch services that impact the lives of all subscribers and businesses across all our markets. All the companies under Etisalat Services Holding play a key role in every aspect of business working with the leaders in the industry. We will continue to expand and invest in all these businesses to be able to launch and deliver innovative solutions in existing and venture into new markets."

ETISALAT SERVICES HOLDING

Enabling Businesses

Etisalat Services Holding - part of Etisalat Group Companies comprises of seven portfolio companies focused on non core telecom services with clients across emerging and developed markets.

Addressing the need of the global telecom operators, industry conglomerates and prominent government entities , ESH enables businesses of the global clients by delivering innovative solutions seamlessly across a wide geographical area.

continue to expand and invest in all these businesses to be able to launch and deliver innovative solutions in existing and venture into new markets."

- Etisalat facilities management
- Emarine
- Etisalat Information Services
- Emirates Data Clearing House
- Tamdeed Projects
- Etisalat Academy
- Ebtikar

ARTICLE

Reducing Complexity in the Roaming Business

Data clearing services industry helps reduce the complexity in a roaming business, both the data and financial clearing elements. Customers today have an improved cost efficiency and maximum convenience being able to make better decisions through comprehensive reporting tools.

Emirates Data Clearing House (EDCH) is the only company in the Middle East that has established itself in the roaming clearing services industry working with GSM mobile operators across Middle East, Africa, Asia and Europe. Its core services today include Data Clearing, Financial Clearing, Revenue Assurance, Value Added Services, Mobile Financial Services and other customized solutions.

Emirates Data Clearing House (EDCH) is the only company in the Middle East that has established itself in the roaming clearing services industry working with GSM mobile operators across Middle East, Africa, Asia and Europe.

Going Beyond Data Clearing

Moving ahead, EDCH is looking to evolve and go beyond data clearing house core services with value added offerings to operators based on their changing requirements. EDCH wants mobile operators to see them as a reliable intelligent roaming and revenue management partner who continuously strive to help grow their business.

As the overall mobile network operators revenue from voice and SMS continues to diminish every year it is essential to focus on business areas that provide long term revenue and growth. It's also not feasible to rely only on data but start focusing on value added services (VAS). EDCH is already investing in moving its focus from core services to building innovative value added services. The value added offering is mainly its Mobile Financial Services Hub (MFSH) which is a new service introduced for all customers. This is a key differentiator to globally support customer acquisition, retention and increase revenues for clients present in the EDCH mobile financial services hub.

Addressing Challenges

EDCH's continuous interaction with its global clientele has seen that mobile network operators are struggling to retain their customers in today's competitive environment, maintain revenue and increase profit. For the end users, it's all about cost savings and the best customer experience.



Nasser Salim

General Manager
Emirates Data Clearing House



EDCH has always invested in technologies and services to meet various requirements of its clientele across markets. The mobile financial services hub works closely with mobile network operators to manage their needs from initialization to realization. EDCH has managed to establish itself as a turnkey solution provider with its unique solutions helping clients meet the changing market environment and address the challenges faced by them.

Monetizing Network Investments

EDCH primarily focuses on roaming clearing and play a major role in monetizing operator's roaming data by developing analytical tools that can help clients to plan, implement, monitor, predict and settle roaming agreements with special discount leading to cost savings and generate revenues. With fraud threats impacting the business environment it has become integral to support customers in minimizing these risks by working closely with them in preventing these threats.

Threats Faced by Operators

With technology innovation and advancement impacting all aspects of businesses today, it's become a challenge for businesses to innovate and launch new business propositions in the market. Companies invest in creating new products and services however in today's competitive scenario face the threat of cannibalisation of products and services.

Upcoming Trends in the Next Gen Revenue Management Space

As companies get more customer centric and launch new initiatives to enter new markets, they are constantly looking to create new business models

to improve operational performance. They are investing in analytical tools to capture relevant data and use business intelligence to analyse business performance and create avenues for business growth.

Enterprises are investing in creating tools for predictive data analysis as it helps them chart out their business path in the future. Business are also looking at aggressively building their online platforms with the right tools as this has become top priority for growth today. This is the best way to reach out to audiences across markets to meet their various requirements.

EDCH in Asia Pacific Markets

The next level of growth is from developing markets with an expectation of high business volumes. In spite of a low ARPU, these markets have low ARPU and present vast opportunities. This is mainly due to the increasing adoption of technology and these markets are tech savvy with a majority of them being early adopters. They are also willing to pay for premium services and quick to adapt new technology and services. With the regulatory environment becoming more conducive to online business and its platforms, these countries will gain more popularity and be one of the top destinations to conduct business.

Plans in 2017 for Business Growth

EDCH plans to focus on carrier grade WiFi, SIM based authentication, data and financial clearing across the markets to expand its business footprint with a successful business portfolio.

With operators globally focusing on roaming, EDCH was closely working

with Sudatel in Africa to provide international WiFi roaming services to enable subscribers to use these services at a cost lower than roaming data. This development will also help subscribers to recharge their local SIM card with the recharge vouchers while roaming abroad. In this case subscribers can retain their home number while roaming internationally. EDCH is currently providing both WiFi hub services and

EDCH primarily focuses on roaming clearing and play a major role in monetizing operator's roaming data by developing analytical tools that can help clients to plan, implement, monitor, predict and settle roaming agreements with special discount leading to cost savings and generate revenues.

recharge everywhere to Sudatel with state of the art technical architecture. They have also signed a strategic alliance with Roshan Telecommunication Afghanistan for recharge everywhere services and look forward to growing this partnership further.

Today, EDCH is among the top global five data clearing houses and gives us a unique positioning as they are part of Etisalat Group. EDCH's plan to invest further in relationships, technologies and services to achieve further milestones. As diversification is key to business growth, it is integral to increase market share across MEA and APAC region with a strong focus on venturing into new product domains. EDCH believes that the mobile financial services hub can grow and has tremendous potential in the MENA region. It is also important to note that the company strategy should be focused on growing market requirements. Mobile network operators also have an important role to play by focusing on innovative product offerings for retail and loyalty via the MFS platform. 



REGULATORY NEWS

UK Competition Watchdog Likely to Probe Fox/Sky Deal

21st Century Fox's £11.7 billion (€14 billion) acquisition of Sky could face a considerable delay, after the U.K. government said it is likely to refer the deal to the Competition and Markets Authority (CMA). Addressing Parliament, Karen Bradley, secretary of state for culture, media and sport, said a review by telco and media watchdog Ofcom has concluded that the proposed merger raises public interest concerns related to media mogul Rupert Murdoch's influence over the U.K. news agenda and the political process. "On the basis of Ofcom's assessment, I confirm that I am minded to refer to a Phase 2 investigation, on the grounds of media plurality," Bradley said. Phase 2 CMA investigations include written and oral submissions from the merging parties and interested third parties, and can take more than six months to complete. Fox and Sky have

until 14 July to respond to Bradley's quasi-judicial ruling. During this period, the companies could offer concessions in a bid to avoid a Phase 2 investigation. "We think there is a high probability of the deal being referred to the CMA but that ultimately a mutually acceptable set of remedies should be found," said RBC Capital analyst Wilton Fry, in an investor note. Fox agreed to buy the 60.9% of U.K.-based TV and broadband provider Sky that it does not already own in December 2016. At the time, Fox said the merger would create a global leader in content creation and distribution, and give it leading direct-to-consumer capabilities. It marks the second attempt by Rupert Murdoch to acquire full control of Sky. Murdoch's former company, News Corp, launched in 2010 a £12 billion bid for the outstanding 60.9% stake in Sky – then called BSkyB – that it didn't already own.



The acquisition was abandoned amid staunch political opposition that became particularly vociferous after News Corp's now-defunct tabloid, the News of the World, was revealed to have hacked the voicemails of politicians, celebrities, and even murder victims and their families. The scandal forced News Corp to split into two distinct firms. 21st Century Fox took control of the company's media assets, including its 39.1% stake in Sky, while a new News Corp took ownership of the publishing business. However, it became clear in January 2016 that Fox had not given up on Sky, when the latter appointed Rupert Murdoch's son and Fox CEO James Murdoch as its chairman.

FNA Investigates Requirements for Potential 5G Frequencies



German regulator the Federal Network Agency (FNA, known locally as the Bundesnetzagentur or BNetzA), has published guidelines concerning the mobile frequency bands that could potentially be used for 5G, as it seeks to encourage the nationwide rollout of next generation wireless networks as early as possible. The framework is intended to set the guidelines for the introduction of a demand-finding method for the provision of 5G-suitable frequencies, and assess the availability of sufficient spectrum for all interested parties. "We are creating planning and investment security for the rollout of networks with

the next mobile generation 5G,' said FNA President Jochen Homann, adding: 'We are providing the required frequency resources at an early stage.' The '2GHz' (1920MHz - 1980MHz/2110MHz - 2170MHz) and the 3.4GHz-3.8GHz ranges have been identified as potential bands for 5G networks, and the regulator has called on interested parties to comment on the framework document and submit their requirements for the frequencies by 30 September 2017. Based on the frequency requirements, the FNA will then develop a draft plan on the spectrum, which could potentially be auctioned off in 2018.

Thai Authorities Call on Netflix, YouTube to Register OTT Services

Some 24 digital terrestrial TV channels and 11 OTT operators have already fulfilled the registration request of National Broadcasting and Telecommunication Commission (NBTC). Other such as the US video streaming and social media giants, have been given 30 days to comply with the mandatory order, The Bangkok Post reports. Under these plans, foreign OTT platforms are required to establish and register a local office in Thailand, which would make them liable to corporate income tax. The offices must be led by executives authorized to issue service directives and clarify any problems that

emerge in Thailand. Any OTT provider who misses the NBTC's 22 July deadline for registration may have an advertising or other ban imposed on it to limit its revenue stream. However, the regulator has no intention to fine or shut down the local operations of those companies who fail to comply, for fear of inconveniencing users, says the daily newspaper. The NBTC chairman Colonel Natee Sukonrat has previously said that major digital platform owners, such as Facebook and YouTube, have a responsibility to work with the NBTC to ensure that unsuitable content and illegal advertisements are not on their sites.



ARCEP Authorizes SFR, Bouygues to Use 2.1GHz Band for LTE

French telecoms regulator ARCEP has adopted two decisions authorizing mobile operators Bouygues and SFR to use the 2100MHz band for LTE services, following the cellcos' requests to allow technological neutrality in the band. ARCEP said that the new decisions will allow the duo to improve their 4G

speeds, while also stating that Orange France and Free Mobile have the option of submitting similar requests to the regulator. TeleGeography notes that ARCEP launched a tender for four UMTS concessions in the 2100MHz band in December 2000. The authority revealed in February 2001 that it had received two

formal applications by the 31 January deadline, with Orange France and SFR subsequently granted 3G concessions in August 2001. In December ARCEP re-launched the contest for the remaining two licenses, and the sole bidder, Bouygues Telecom, was awarded a 2100MHz concession in September 2002.

EC Aims to Simplify Law Agencies Data Access

The European Commission (EC) will put forward proposals to allow law enforcement agencies easier access to data, in a move which could shape future legislation amid growing pressure for tougher internet rules. Speaking to Reuters, Justice Commissioner Vera Jourova said the EC will present options

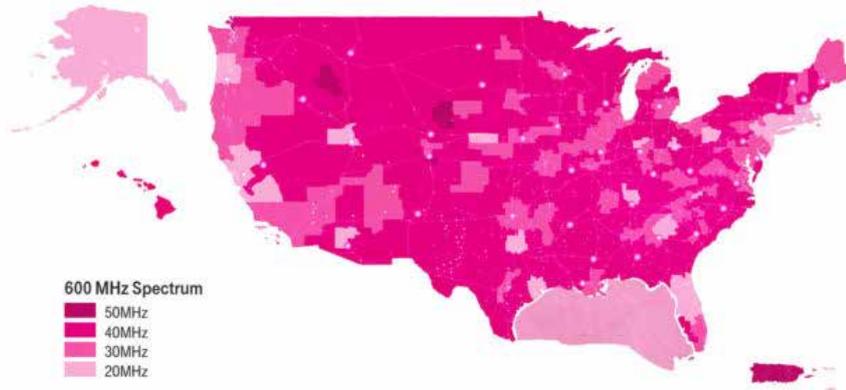
to ministers including the possibility for police to copy data directly from the cloud, and enabling law enforcement to access information or evidence stored in other countries across the bloc. UK Prime Minister (at the time of writing) Theresa May called for tougher regulation of internet companies earlier this week, following the latest in a series of terrorist attacks in the country. Her comments once again placed a spotlight on companies including Google and Facebook, which are facing increasing pressure to do more to assist investigations relating to terrorist activity. "I am sure that now in the shadow of the recent terrorist attacks and increasing threats in Europe there will be more understanding among the

ministers, even among those who come from countries where there has not been a terrorist attack," said Jourova. If the options are adopted it would enable law enforcement agencies in one member state to request information from IT providers in other EU countries without first having to seek permission from that country as is currently the case. A more stringent proposal is for companies to be obligated to hand over data when requested by any member state. However, the proposals are likely to face a backlash from major technology companies, which have already voiced concerns over the impact allowing governments access to such data will have on consumers privacy. EU Justice Ministers will reportedly meet today (8 June) to discuss the EC's options, and then a formal proposal will be presented by the end of this year or early 2018.



FCC Formally Grants 600MHz Licenses; T-Mobile to Start Testing This Summer

Depth of T-Mobile's New Nationwide 600 MHz Spectrum



The US Federal Communications Commission (FCC) has confirmed that the Wireless Telecommunications Bureau has formally granted the 600MHz spectrum licenses sold in its recently concluded 600MHz Broadcast Television Spectrum Incentive Auction ('Auction 1002'). The bidding process raised (in net bids) a total of USD19.318 billion, with 50 bidders placing winning bids for a total of 2,776 licenses. As previously reported by TeleGeography's CommsUpdate, T-Mobile US comfortably dominated

the Auction 1002 bidding process. The Deutsche Telekom (DT)-backed firm agreed to pay USD7.993 billion for a total of 1,525 regional licenses, edging out satellite TV operator – and long-time wireless market aspirant DISH Network (bidding as ParkerB.com Wireless) – which bid a total of USD6.211 billion for 486 licenses. Other notable bidders include: cable giant Comcast (bidding as CC Wireless Investment), which agreed to pay USD1.725 billion for 73 licenses; AT&T Mobility (USD910.2 million, 23 licenses);

and US Cellular (USD328.7 million, 188 licenses). Less is known about the intentions of Channel 51 (USD858.7 million, eight licenses) and Bluewater Wireless (USD568.3 million, 66 licenses), although the latter previously bid in the FCC's 700MHz auction, in association with venture capital firm Northwood Ventures. Following the FCC's 14 June handover announcement, lead bidder T-Mobile US has wasted no time in setting out its stall. A media announcement from the mobile giant read: 'With the spectrum transfer complete, the real fun begins. Despite the cries from sceptics, T-Mobile has already kicked off deployment activities and will see the first sites ready for testing this summer! This timeline – well ahead of expectations – sets the stage for commercial operations later this year. That's when new 600MHz smartphones from leading smartphone manufacturers are anticipated to arrive. T-Mobile has been working closely with the FCC and broadcasters and expects more than one million square miles of 600MHz spectrum to be clear and ready for deployment by year-end.'

Welsh Government Consulting on 30Mbps Broadband

A public consultation has been launched by the Welsh Government regarding plans to bring 30Mbps-capable broadband connectivity to every property in the country, ISPReview reports. The 30-day consultation has begun after the authorities confirmed they are seeking to ensure that every property in Wales has access to 'fast reliable broadband' (i.e. at downlink speeds of 30Mbps or more) by 2020. The development follows on from reports in November last year that the government was planning to back a second broadband rollout project; it is already cooperating with BT infrastructure unit Openreach on the state-aid supported 'Superfast Cymru' project, under which fiber-based broadband is being made available to

around 95% of Wales (or around 690,000 premises) by the end of this year. In this latest consultation – which will run until 13 July 2017 – the Welsh Government detailed the number of premises that cannot currently access superfast broadband and those that are not expected to be reached with a commercial rollout in the next three years. Having said there are a total of 98,145 such properties, it proposes to conduct an open procurement process in respect of these. According to the report, the authorities are aiming to issue an Invitation to Tender (ITT) during September 2017, with a contract to be awarded by the end of the year. Commenting on the matter, Julie James, Welsh Minister for Skills and Science, was cited as saying: 'The



consultation will help us to further refine the list of unconnected premises. The more responses we receive, the more comprehensive the list will be. If there are communities that have an interest in driving their own solutions, I want to hear from them. If there are views on how we should lot the procurement, I want to hear them. If there are views on how we should prioritise or target the funding, I want to hear them.'

SLT, TRC Set for Investigation into Phone Call Scam

Two separate investigations are set to begin into a phone scam was reported which had many mobile phone users alarmed today. Minister of Telecom and Digital Infrastructure Development Harin Fernando told Daily Mirror that both the Telecommunication Regulatory Commission (TRC) and Sri Lanka Telecom (SLT) would conduct separate investigations into the reports. "I have issued instructions to both the TRC and the SLT to investigate these reports and send me their findings," the minister said. He assured that the racketeers behind the scam will be dealt with after their identities

are uncovered. Many mobile users complained that they had received overseas phone calls which were cut before they could answer them. Some users said no one had answered when they called back. However those who returned the call had been charged an exorbitant amount of money for making the call to that number. Some mobile phone users said they had received calls from the US while others said theirs had come from the West Indies. Meanwhile, a private mobile phone service provider had assured the public that they would conduct their own inquiries into the alleged scam.



Bharti-Telenor Deal Gets Nod from Stock Market Watchdog

Operators apply for clearance from India's competition regulators. Bharti Airtel inched closer to completing its acquisition of Telenor India, after the deal was approved by the Securities and Exchange Board of India (SEBI). The Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) also gave their consent. In a brief statement, Bharti Airtel said that it, and Telenor, have now applied for approval from the New Delhi Bench of the National Company Law Tribunal.

The merger also requires approval from the Competition Commission of India. Under the deal, agreed in February, Bharti Airtel will acquire 100% of Telenor's Indian subsidiary, including its spectrum, subscribers, employees, and operations. At the end of March, Telenor India had 50.4 million customers across the telecom circles of Andhra Pradesh, Bihar, Maharashtra, Gujarat, Uttar Pradesh (UP) East, and UP West. It also owns spectrum in Assam. Bharti

Airtel is particularly keen on Telenor's 43.4 MHz of 1800-MHz spectrum, saying on Thursday that it will "further bolster its strong spectrum footprint" in these seven circles. Meanwhile, the addition of Telenor's customers will increase Bharti's subscriber base to more than 324 million. "These circles represent a high population concentration and therefore offer a high potential for growth," the telco added.

Industry Bodies Gang Up on EU Over 5G

ETNO, GSMA, DigitalEurope, Cable Europe among those accusing EU of being too timid to adopt pro-investment regulations. The European Union incurred the collective wrath of a group of industry associations concerned about its supposed lack of ambition when it comes to 5G. The group, which includes Cable Europe, DigitalEurope, ETNO, and the GSMA, among others, said in a joint statement that they are concerned that

discussions in the EU Parliament and Council about the proposed Electronic Communications Code (ECC) and the ePrivacy Regulation favor a "timid approach that will do little to improve Europe's chances of success." Currently, the outlook for innovators appears quite grim," they said. The statement was issued less than two weeks after an open letter signed by the CEOs of some of Europe's biggest telcos warned the EU that proposed amendments to the ECC and ePrivacy regulation could put future investment at risk. The ECC, unveiled by the European Commission in September 2016, proposed 25-year spectrum licenses, and strict rules requiring the effective and efficient use of airwaves. It also calls for EU-wide coordination when it comes to assigning frequencies with the goal of improving mobile coverage

across the bloc. The proposals have encountered resistance in some quarters of the EU Parliament though, as some member states have reportedly argued that 25-year spectrum licenses will make it harder for frequency allocation to keep pace with advances in technology. The industry bodies on Wednesday reiterated calls for pro-investment, pro-innovation regulatory reform in order to encourage network rollout and the launch of exciting new digital services. "5G is one of the engines of European innovation, a tool to ensure improved consumer experience across industries, as well as a crucial enabler of the continent's competitiveness," the group said. They called on the EU to "maintain a high level of ambition to ensure that the strategic 5G objectives remain at the core of Europe's digital reforms."



PTA Issues Framework on Regulatory Remedies & Solutions for Service Provision by WLL Operators

PTA Issues Framework on Regulatory Remedies & Solutions for Service Provision by WLL Operators. The framework launched yesterday at PTA official website aimed at focusing on possible options for regulatory remedies for limited mobility services. With the increasing demand of high speed mobile broadband networks, technological advancement on the standards developed by ITU, IEEE, ETSI, 3GPP, 3GPP2 and the regulatory provisions on limited mobility, various solutions are being explored to ensure an acceptable outcome for the

fixed and mobile sector. The framework highlights the legislative issues and summarizes the consultation made with stakeholders for its implementation in the light of Section 5.4 of the Telecom Policy 2015. Back in 2003, the fixed line telecom Deregulation Policy was issued by the Ministry of Information Technology Government of Pakistan (GoP) with a view to promote fixed line subscriber penetration, develop infrastructure and increase in service choice for customers of telecommunication services at competitive and affordable rates. The

policy proposed issuance of technology neutral fixed line Telecom Service Licenses (Local Loop, Long Distance International). Generally, fixed line connectivity is provided by laying copper or fiber cable for the last mile solution which is not only expensive but also is cost prohibitive in some cases. Therefore, GoP authorized the Local Loop Operator to use wireless local loop (WLL) solution in the Local Loop confining to Limited Mobility i.e. mobility within a cell not beyond the Local Call charging radius.

Four States to Build Out Rural Broadband Infrastructure with Federal Grant Money

Agriculture Secretary Sonny Perdue recently announced that USDA is awarding four loans to help provide broadband service in rural portions of Illinois, Iowa, Texas and California. "Too many rural areas still lack access to robust, affordable broadband services that can create jobs and boost rural economies," Perdue said. "These broadband infrastructure investments will connect rural communities to a digital future and will help expand access to high-speed internet, health care, educational and business services in rural communities." Perdue announced the broadband loans after celebrating Infrastructure Week with President Donald Trump in Cincinnati, Ohio, last

week. He had a scheduled meeting with the White House Infrastructure Council. USDA's partnerships with more than 500 telecommunications providers across the country fund broadband infrastructure investments that are uniquely designed to meet the specific needs of each rural community. These projects connect residents, businesses, healthcare facilities and community facilities – including schools, libraries and first responders – to the internet. The \$43.6 million announced last week will add nearly 1,000 miles of fiber to fund broadband service. The funding will be used as follows: Illinois' Viola Home Telephone Co. will use a \$3.3 million loan to construct 104 miles of fiber cable

and provide supporting equipment to deliver enhanced telecommunications services to its rural subscribers. USDA is awarding a \$24.8 million loan to the Central Texas Telephone Cooperative Inc. to construct 568 miles of fiber and install equipment upgrades in seven of its 17 exchanges. California's Ducor Telephone Co. is receiving a \$9 million loan to construct 67 miles of fiber and update equipment to improve quality, functionality and network reliability. In Iowa, the Coon Valley Cooperative Telephone Association will use a \$6.5 million loan to construct 216 miles of fiber to improve access to advanced telecommunications services. USDA is providing these loans through Rural Development's Telecommunications Program. This program funds infrastructure and equipment to deliver broadband and distance learning and telemedicine services throughout rural America. USDA Rural Development provides loans and grants to help expand economic opportunities and create jobs in rural areas. This assistance supports infrastructure improvements; business development; homeownership; community services such as schools, public safety and health care; and high-speed internet access in rural areas.



MoIT Moves Policy Directive for Testing 5G Services in Pakistan

It appears that Pakistani government in general, and Ministry of IT in particular, is going to continue its particular focus to keep the telecom industry on the growth trajectory. This is particularly important as the government has already held three successful transparent commercial auctions of frequency spectrum during its tenure. Now, in a major development, Ministry of IT and Telecom has moved a Policy Directive for consideration of the Federal cabinet to enable Pakistan to test New and upcoming technologies including the Fifth Generation (5G) mobile communications. If approved, Pakistani operators will be allowed to test 5G technology on their networks and prepare themselves for the deployment as soon as 5G technology will be available for commercial roll-outs. Minister Anusha Rahman has firmly promised – while speaking at various events in the past – to make Pakistan one of the first countries to test, trial and launch the Fifth Generation (5G) Mobile technology. 5G is the next big evolution which will enable new ground breaking data rates and revolutionize the customer experience for services / applications compared to what is available today.

In line with its 2015 Telecom Policy and its commitment for providing state of the art services to the people of Pakistan, MoIT has embarked upon a new journey with this directive to PTA. As per the draft proposal, PTA / FAB (Frequency Allocation Board) will identify / set aside appropriate bandwidth in the frequency spectrum blocks currently under consideration for 5G. Testing entities will be allowed access to such frequency blocks for testing purposes only. PTA will roll-out such test trial facility for the new technologies through a regulatory framework to be issued in line with the Section 8.14 of the Telecom Policy 2015 for Temporary Test and Development Licenses/Authorizations within three months. The regulatory framework shall include criteria for the provision of the test licenses, conditions, duration and other terms and conditions of reissuing the test licenses on expiry. To continue the spirit of inclusiveness of all stakeholders in new and innovative ventures PTA will engage all the concerned organizations such as telecommunications operators, equipment manufacturers and research & development institutes for a successful execution of 5G trials. The working to be set up for execution of this policy will also recommend further suitable frequency bands if required in view of future technology/standards development as well as other technical and logistical requirements for the trials. To keep the transparency of the process and to apprise the public about developments ensuing from such technology test and trials will be regularly published in the annual report of the Authority. While releasing the policy directive for consideration of the Cabinet Minister of State for Information Technology Ms. Anusha Rahman said that The Ministry has stayed committed to accelerated digitization through proliferation of broadband and particularly Mobile broadband. Keeping the focus we shall ensure that Pakistani nation stays at the cutting edge of technology and the Policy directive is meant to ensure and showcase the continued commitment. 5G is expected to a big catalyst in taking Pakistani ICT market and usage to a whole new level for the benefit of economy and masses, she added.



Pakistan All Set to Test 5G Mobile Internet by 2020

Pakistan is set to test the most advanced mobile internet, 5G, by the year 2020, as the telecom regulator works towards setting technical standards and inviting applications from mobile operators for the spectrum award. "The government would facilitate all existing as well as new companies to test 5G in Pakistan. The facilitation would be in the form of free test license and spectrum," said Pakistan Telecommunication Authority (PTA) Chairman Dr. Syed Ismail Shah at a workshop in Islamabad. "Harmonized spectrum for 5G is [available] in the 3.5 GHz band," he informed participants at the workshop, according to a PTA handout. An EoI [Expression of Interest or invite for applications] would be floated

at a suitable time to gauge interest in conducting a trial before the standard is finalized in the year 2020," he said. Currently, 5G mobile broadband is not available in any country. However, the US, UK, China and South Korea have set 2020 as their deadline to launch the service. Shah said that the government has always encouraged new ideas and supported initiatives for the use of technology. He added that the PTA and Ministry of Information and Technology (MoIT) are working on several fronts to increase the access of broadband technologies to far-flung areas of Pakistan, and improve the quality of service and quality of experience while keeping pace with the modern technologies. The PTA and Ministry of

IT and Telecom Division in collaboration with Qualcomm Pakistan organized the one-day workshop on 'Technology Evolution & Roadmap to 5G' in Islamabad. Minister of State for IT Anusha Rahman has also on several occasions stated that Pakistan would be among the first few countries in South Asia to have 5G services. The workshop was arranged to take steps toward introducing the latest technologies in line with the vision of the government of Pakistan. Another speaker Khalid Barghouti talked about evolution, tests, trials and development of 5G technologies in various countries. "Some countries have even declared access to broadband as a basic human right," he said.

NBTC, FCC Sign Deal for Telecom Regulatory Development



Thailand will take another step forward in its telecom regulatory development with a collaborative agreement between the National Broadcasting and Telecommunications Commission (NBTC) and the Federal Communications... The NBTC was approached by the FCC, an independent US government agency overseen by Congress, to sign a memorandum of understanding (MoU) in knowledge exchange on regulatory

development in telecom and... The cooperative work with the FCC will enable the NBTC to modernize regulatory development in telecom. We also expect the FCC to help us remove illicit content posted by US-based social media," said Takorn. He said FCC Chairman Ajit Pai had sent him an email last month explaining his interest in Thailand's telecom regulatory development and the auction procedures for the fourth-generation (4G) licenses. Mr. Pai proposed that the work of both parties could be further developed through a MoU agreement. He also invited NBTC commissioners and delegates to visit the FCC office in Washington. In a related development, NBTC chairman ACM Thares Punsri last week inked a MoU with Nikolay Nikiforov,

Russia's Minister of Telecom and Mass Communications. The agreement aims to create collaboration in cybersecurity and joint development of telecom and broadcasting services between the two nations. Cybersecurity is the primary point of interest for Thailand, as the Russian government has expertise in dealing with the growth of mobile payment usage, especially in terms of fraud prevention and mitigating. He said the Russian and Thai governments will work closely in the areas of strategic knowledge for cybersecurity and reduction of international mobile roaming fares. "Knowledge on measures governing fund transfers, fraud and illegal content will be beneficial for the Bank of Thailand and national security agencies," he said. Thailand has almost 100 million mobile. Thailand has almost 100 million mobile subscribers and increasing popularity in using mobile payment via telecom networks is also creating more sophisticated forms of fraud.

Operators Plead With Europe to Deregulate

The bosses of several of the biggest European operators have written to the EC to object to proposed amendments to the Electronic Communications Code and ePrivacy Regulation. In the letter, which was leaked to the FT, the CEOs of DT, BT, Orange, Telecom Italia and Telefónica assert that amendments to those pieces of legislation, which reverse moves to deregulate included in the original drafts, will harm investment and inhibit the rollout of FTTH and 5G. It seems the amendments were made in response to objections from member states that fear the deregulation will result in reduced competition, presumably due to the telecoms M&A environment being made more benign. "The initial strategic focus on investment and innovation appears lost and current developments risk hampering the ability of companies to deliver for European citizens and businesses," says the letter. "We believe that growth, employment, investment and contribution to taxation are at stake." "Other regions of the world are out-investing Europe 2 to 1 in digital networks. This should be

a reason for alarm and action, especially in the context of global competition and fast-paced technological change." The letter was apparently delivered by the European Telecom Network Operators' Association and was also signed by a bunch of other European operators. The

M&A vs investment dichotomy is a long-standing one in European telecoms, with the O2/Three merger blocked on those grounds. Europe's response to this letter may indicate which way it's currently leaning on this matter.





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The relentless pursuit of innovation enlightens
the intelligent world



ARTICLE

Socio-Telecom Link in Mauritania

Mauritania is a unique country that has a variation of everything. It falls geographically in Al-Maghreb al-Arabi and north of sub-Saharan Africa. A few miles away from the desert, one would find the ocean in the capital city Nouakchott. Within the same mile, you can see the latest car models and the poorness in the city. A rich man is a humble man wearing the traditional dress of Mauritania "Daraa". They would take the opportunity to go to the desert whenever they get a chance. It's a relaxing original spot for most, far from the crowd and the quick rhythms of the city that most foreigners see it as calm. However, Nouakchott as capital represents only 0.4 % of the total land of the country and accommodates about 30% of the population. As you go in the streets and interact with people, you hear different accents and languages; Hassania (Arabic in nature), French, and some local African languages.

Three Mobile Network Operators are competing on such small population; approximately 3.6 million, on the other hand ARPU is more than 5 USD that is high in comparison to Africa and to the region, and the mobile penetration rate is exceeding 100% and its also higher than the African average of penetration 81%.

Telecom Sector Overview

The variation & uniqueness of the country also applies to the telecom industry. Three Mobile Network Operators are competing on such small population; approximately 3.6 million, on the other hand ARPU is more than 5 USD that is high in comparison to Africa and to the region, and the mobile penetration rate is exceeding 100% and its also higher than the African average of penetration 81%. A dramatic increase in internet penetration is witnessed, from 0.7% in 2010 to 41% in 2016, 3G launch in was in 2011.



Mohammed Elmalik

Senior Manager, Commercial Department
Chinguitel Telecom Company, (Sudatel Telecom Group Subsidiary)



Wide range of telecom services are offered in the market from the very basic ones to the highly advanced. CDMA is still popular in the market for talkers and those who travel frequently to the regions where there is no or limited electricity, its battery last for long time and it has wider network coverage length that why! A very obvious characteristic of the market is the domination of the bonus on recharge cards, it grows in popularity & complexity day after day and it's a tangible thing that why! In addition, VAS services are booming. You find advanced services compared to other markets such as gifting packages to your beloved friends & family instead of transferring credit and beep call service (which allows making "call" without having credit), although MCN as a traditional VAS service was launched late in the market!

The Ministry of Telecommunication is running strategic projects on national connectivity infra-structure, Fiber optics between and within the cities through WARCIP project, this to insure infra-structure for future digital services. In addition the ministry supports and facilitates to operators covering areas with low population. It's crucial for the Authority of Regulatory to grantee good level of service in the market through regular tests on MNO's. It's applying rules to insure fare competition in the market; it has been awarded "Best Authority of Regulatory in West Africa in 2012" by Africa Telecom Forum.

Social Telecom link:

Since each market is unique with its own cultural attributes, it is noted that the social life and telecom are impacting each other.

The traditional dress for men (called Daraa), has a very big pocket in the front. Daraa also works as sleep dress when its cold, face cover from the sun when its hot. These bigger than average pockets in the national dress provides a comfortable choice to carry more than one handset. The multi handset behaviour is affecting the loyalty in a negative way.

Looking at wedding traditions, serving "Bounty" chocolates is a traditions at wedding parties. it's customary for the groom to provide small gifts to friends of the bride. Nowadays, scratch cards with

different types of chocolates is gifted. In the past, this used to be a recorder or traveling bag with some clothes. This is just an example of how the telecom is linked to societal traditions and reshaping lives! In addition, few days after the wedding, the bride has to receive a brand new handset. Latest models are preferred. This signifies giving the girl freedom, because conservative families don't usually allow usage of mobile before marriage. They use the mother's mobile. These factors often have an impact on estimating addressable market sizing.

Word of mouth is more powerful than you can imagine. In a small, highly connected society, families and friends gather to drink green tea (locally named Attay) and share news, as well as experiences and exchange information. This is how typical communication looks like. Not much ATL (Above The Line advertising on the streets or TV commercials)

One of facts that the society is highly interconnected and people are so kind, its normal to ask anyone nearby to make call when your phone is off. In occasions such as Eids, gifts are given and smartphones are common, and that is one of the thing helped the increase in the internet penetration and usage somehow. Also a significant amount of international traffic is noticed, its mainly directed towards nearby countries because lots of trading across borders is very common also some tribes are socially linked with nearby countries.

One of the good things especially about youth, that they are having business mindset. Lots of entrepreneurs are starting up and the government support such trend. They use different numbers for different purposes and they know how to smartly optimize and allocate their spending across the MNO's. With numbering plans easy to catch and to remember "8 digits", most of customers don't have to worry about their number being an address or an identity that is a challenge for MNO's to maintain good level of loyalty in such high

penetration rate, yet one of the numbers is used as an identity by considerable amount of customers.

Financial sector is growing. In a small, highly-connected society, the social link is driving customers' behaviour. The need to exchange money between the urban and rural areas, given the limited availability of mobile financial services, created casual social networks that dominated the money transfer sector. These casual networks have a distribution network far larger and far stronger than that of banks and mobile telecom operators

One of the "Sufi orders" and it is one of the largest place for religious education located in South East Nouakchott. It accommodates Mauritians and other nationalities. Fixed Wires Telephony was ordered to enable students to connect with their families although 3G mobile network was available in the area. Internet services may disturb students focus on education if it's misused. Again, this is an example of the relation between telecom & society. Also changing the traditional image of religion education centers from being "isolated" to being "connected". Any limited connectivity better than nothing.

More and more examples on how social life and telecom are connecting to each other, especially in regions and rural areas, and this is just a highlight about this link, I believe the social telecom link exists in each market and it is important to understand customer behaviour in each market. 📍

Source: Authority of regulatory.

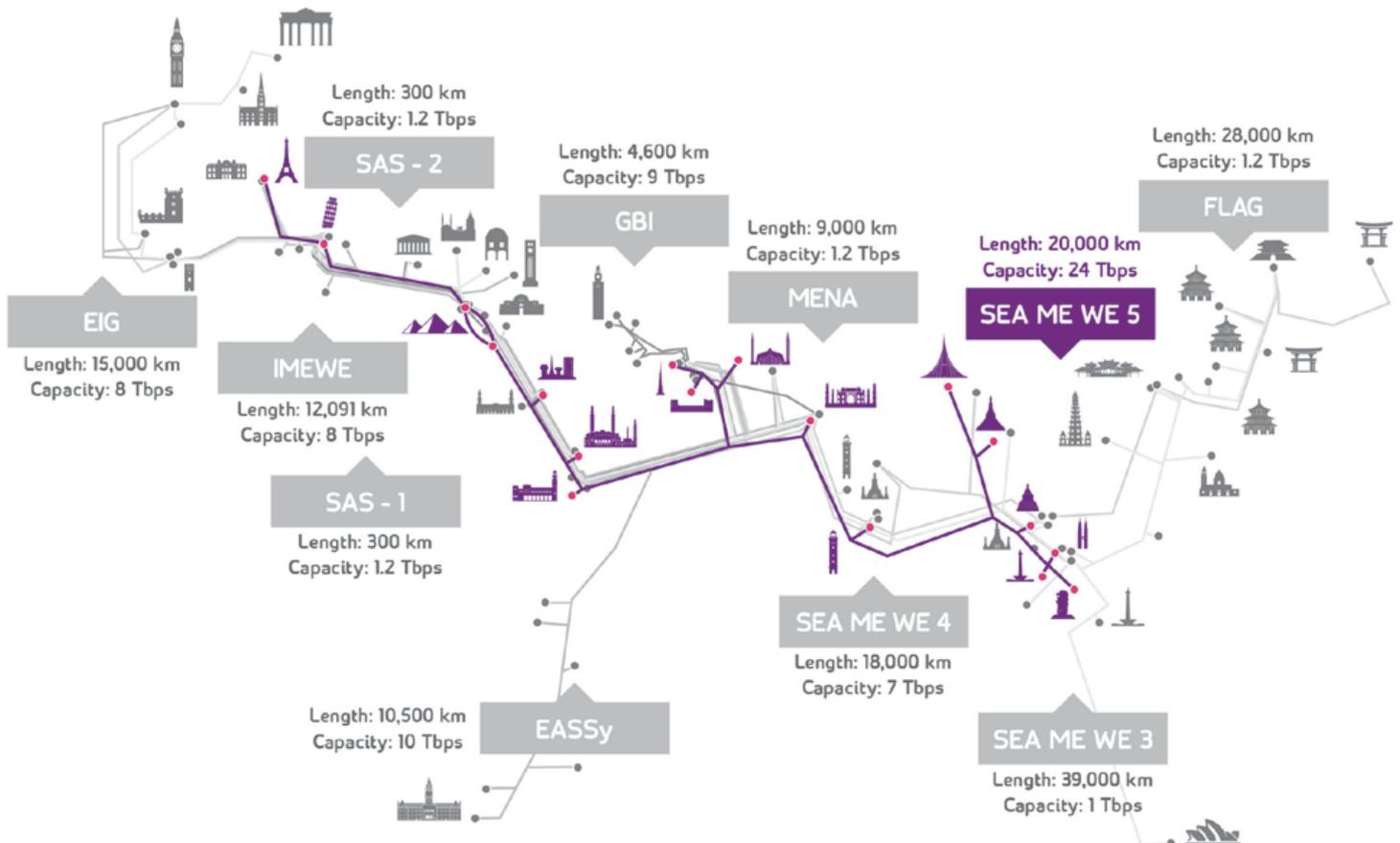




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A SNAPSHOT OF REGULATORY ACTIVITIES IN SAMENA REGION



Bangladesh

The Bangladesh Telecommunication Regulatory Commission (BTRC) has asked the government's permission to cancel the operating license of mobile provider Pacific Bangladesh Telecom (CityCell), which has effectively been out of operation since Q4 2016 when the authorities suspended its services for non-payment of debts, reports the Daily Star. The CDMA-based cellco, which is 45% owned by Singapore's SingTel, has remained in existence only via court orders allowing it time to pay instalments of overdue fees, but according to the regulator CityCell did not make any payments for fresh dues incurred between October 2016 and March 2017. Meanwhile, CityCell has paid nearly 65% of the total overdue spectrum/license/revenue sharing/late penalty fees demanded in October, whilst also continuing to dispute the total amount demanded by the BTRC. (June 13, 2017) telegeography.com

Bangladesh has advanced significantly in Internet connectivity and effectively led major South Asian countries, with nearly 42% of total population using Internet for various purposes, according to official sources. The latest data shows that the total number of Internet users has reached 67.24mn at the end of February, 2017. The whopping number is around 41.52% of the total population of the country, leaving many Asian powerhouses behind with a huge margin. According to available data from some Internet users' monitoring sites, neighboring India has over 460mn Internet users, which is 34.83% of its total population. Sri Lanka has 7mn Internet users, which is 29.30% of its total population. In Pakistan, only 17.81% of its total population use Internet. The number of Internet users surged in the past nine years from 2.67% in 2008 to 41.52 this year due to some breakthrough decisions and steps taken by the current government led by Prime Minister. This year too, the government has given special priority to ICT, as Finance Minister Abul Maal Abdul Muhith has proposed an allocation of 39.74bn taka for the information and communication technology division, an amount which is 21.55bn taka more than the revised budget of 2016-17 year. Muhith in his budget speech said around 18,500 government offices have been brought under a single network. The existing capacity of the submarine cable has been increased to 200 gbps (gigabits per second) from 44 gbps. The government also has plans to take the rate of Internet penetration in the country to 100%, ensuring high speed broadband internet at cheap rate to all the government offices, educational institutions, health centers and union parishads, expanding 3G network to all across the country and launching 4G by 2020. "We have already brought all the sub-districts in the country under fiber optic cable network. Work under project titled Info Sarker-3 is going on to bring all the unions in the country under the network," said State Minister for ICT division Zunaid Ahmed Palak. "We have

set a target of ensuring employment of 2mn people in ICT sector and achieve the export income of \$5bn by 2021 by utilizing the continuous policy support of the government of Prime Minister Sheikh Hasina and the digital dividends," he added. Palak said the proposed budget would play a catalytic role in achieving the aforesaid targets. "Bangladesh will surely become a high middle income country by 2021 and high income country by 2041 with the continuous expansion of ICT sector," Palak hoped.

(June 7, 2017) gulf-times.com

Mobile operators may share 5.5 percent of their revenue with the government for their 4G services, officials said. Following the advice of Prime Minister's ICT Affairs Adviser Sajeeb Wazed Joy, Bangladesh Telecommunication Regulatory Commission has decided to bring down the share to 5.5 percent from 15 percent proposed earlier. "We think revenue sharing for 4G services should be exactly like the present structure," BTRC Chairman Shahjahan Mahmood said after a commission meeting yesterday, when the decision was taken. At present, mobile operators share 5.5 percent of their revenue from 2G and 3G services with the telecom watchdog. In addition, they forward 1 percent of their gross revenue to the social obligation fund. The development will bring a sigh of relief for mobile operators, who were aggrieved by the telecom regulator's proposal to hike the spectrum prices and revenue sharing percentage for 4G services as it would make the technology commercially unviable. The Global System for Mobile Association, a union of mobile operators worldwide, earlier this month urged the government to reconsider its decision. In its original proposal, the BTRC has recommended Tk 15 crore as license fees for 15 years and another Tk 7.5 crore as annual fees, both of which will remain the same in the amended recommendation that will be sent to the telecom division shortly. Earlier in April, the BTRC had sent its guideline on 4G services to the telecom division and in a meeting with industry stakeholders Joy pushed for a lower revenue-sharing quotient for the telecom watchdog, said another top official of BTRC. "In line with that meeting's decision we are changing our recommendation," said the official, who was present at yesterday's commission meeting. The BTRC's commission meeting will resume again today to finalize the spectrum prices for the next auction. The spectrum division has proposed three prices for three separate bands, he said. For the 2100 band the floor price recommended for per megahertz is \$27 million, for 900 band \$28 million and for 1800 band \$35 million. The operators, who currently enjoy technology neutrality in the 2100 band, will be able to do so in the 900 and 1800 bands as well after the auction. Technology neutrality allows operators to offer any service in any band, which will reduce the operators' cost of doing business and improve service quality. The BTRC

has 15 MHz of unsold spectrum in the 2100 band, 10.6 MHz in the 1800 band and some spectrum in the 900 band that was released by Airtel after its merger with Robi. "The spectrum prices are yet to be fixed but definitely they will be much higher than the rate at which it went previously," Mahmood said. In 2013, the BTRC sold spectrum on the 2100 band for \$21 million. The mobile operators have already tested their network for 4G services in the 2100 band and got a reasonable 50 to 100 Mbps of speed for both uploads and downloads. The BTRC has also proposed Tk 150 crore as bank performance guarantee, which has to be paid in two separate segments: Tk 75 crore as rollout obligation and another Tk 75 crore to clear future dues, if any. Under the rollout obligation, the operators will have to take

4G network to all divisional headquarters within the first nine months of getting the license and to district headquarters within 18 months, according to the guideline. They will get a total of three years to complete their rollout of 4G service across the country. If the operators comply with the obligations, they will get a refund of Tk 25 crore in each segment. "After getting the approval we will offer 4G licenses to existing operators, who will be able to launch 4G services within a couple of months," Mahmood said. Currently, 4G services are available in all the neighboring countries. As of February there are around 6.67 crore mobile internet users in Bangladesh, 3 crore of whom use 3G services.

(May 29, 2017) thedailystar.net



Egypt

Egypt's National Telecom Regulatory Authority (NTRA) has confirmed that those companies which secured 4G concessions last year have all now been allocated LTE-suitable spectrum. An official at the regulatory body, speaking on condition of anonymity, was cited as saying of the matter: 'The authority has sent a letter assigning the frequencies to telecommunications companies today.' Further, the official added: 'The companies will redistribute the frequencies in preparation for offering the service commercially in the market within two months.' The fixed line incumbent Telecom Egypt was the first company to bag a 4G license, doing so in August 2016, while all three of the nation's existing mobile network operators – Orange Egypt, Vodafone Egypt and Etisalat Misr – agreed terms for their respective concessions in October that year.

(June 22, 2017) reuters.com

The number of mobile service subscriptions increased by 4.5%, from 94.6 million in February 2016 to 98.8 million in February 2017, according to the Ministry of Communication and Information Technology. The ministry said in a statement that the number of mobile service subscriptions increased by 0.65%, from 98.2 million in January 2017 to 98.8 million in February. On the other hand, the number of internet subscribers fell from

33.8 million in February 2016 to 32.9 million in February 2017, according to the statement. The number of mobile internet users in February 2017 reached 25.3 million subscribers, down from 25.7 million in February, a decline of 1.5%. The statement also pointed out that the number of internet users via USB modem declined from 3.6 million subscribers in February 2016 to 3.3 million subscribers in February 2017, a decline of 8.4%. The number of users of fixed internet ADSL services increased by 11.36%, from 3.9 million in February 2016 to 4.3 million in February 2017. Vodafone accounted for the largest share of new customers in January, adding more than 356,800 clients that month, boosting its client base from 40.2 million in December 2016 to 40.6 million in January, according to data from the Ministry of Communication and Information Technology. On the other hand, the number of subscribers of Orange dropped from 33.8 million in December to 33.7 million in January, losing some 89,400 clients in one month. Etisalat obtained more clients, rising from 23.6 million clients in December to 23.8 million by the end of January 2017, with 175,000 new subscribers. According to the indicators, the sheer number of mobile service subscribers increased by 442,500 clients in January. The total number of mobile services reached 98.2 million in January, up from 97.7 million in December 2016. (May 31, 2017) dailynewsegyp.com



Jordan

The Queen Rania Foundation announced plans to join forces with Google.org, a non-profit subsidiary of the world's largest search engine, to create an online learning platform targeting the kingdom's pre-university-level students. As part of the collaboration, Google.org will grant the foundation \$3m. Designed as an open education resource to improve access to education for pupils unfamiliar with English, the programme will be delivered in Arabic. While a timeframe for the project's implementation has yet to be made public, the foundation confirmed that the first phase will focus on creating

mathematics courses for students in pre-tertiary education. The latest deal comes after King Abdullah reaffirmed the kingdom's commitment to modernizing its education sector on April 15. At around 9.1%, Jordan's illiteracy rate is one of the lowest in the MENA region, with 95% of nationals aged between six and 15 registered in basic education, according to data in the Department of Statistic's 2015 census. Commenting in a discussion paper, the king noted, however, that improving digital literacy had a key part to play in transforming Jordan into a knowledge-based economy. One day after the king's

speech, the Queen Rania Foundation for Education and Development signed a memorandum of understanding with the Arab Banking Corporation Bank for four years' worth of funding to support educational initiatives targeting the country's younger generations. The money will be channeled into two organizations: the Al-Aman Fund for the Future of Orphans, which helps youngsters that have lost their parents to find jobs, university and job training; and the Jordan Education Initiative, which champions the use of technology in the classroom. A report issued by the World Bank in January highlights the progress that Jordan has made in readying the younger members of society for the knowledge economy. According to the international lender, Jordan's efforts to strengthen the physical infrastructure of its ICT-friendly labs and classrooms represent one of the most important contributions to the country's education system. The report was released at the end of the Second Education Reform for the Knowledge Economy programme, a collaborative venture between the World Bank

and Jordan, which ran from 2011 through to the end of 2016. Among its objectives, the \$407.6m programme aimed to better prepare pre-university children for participating in a modern economy. A total of 624 classrooms, 13 ICT labs and 34 science labs were constructed for Jordan's pre-tertiary education system under the programme from a baseline of zero, well ahead of initial targets. The new infrastructure complements earlier initiatives aimed at bringing technology into Jordan's education sector and, more specifically, the classroom. With technical assistance from UNESCO, Jordan rolled out its Open Education Management Information System (OpenEMIS) in September. The information gathered from the schools enrolled in the state-owned OpenEMIS system will enable the country to develop more effective strategies for education. According to the World Bank's report, all schools in Jordan are now registered in the system, with the government planning to extend the initiative. (June 27, 2017) oxfordbusinessgroup.com



The Nepal government plans to link the entire nation with broadband Internet service within two years. The government in the budget for the current fiscal year has stated that all the district headquarters, municipalities and rural municipalities will be connected by optical fiber laid down beside the national highways and roads connecting district headquarters within two years. "Broadband Internet service will be expanded to ward-level. Telecommunication service providers will be encouraged to get merged in order to make the telecommunication service more systematic and competitive," the then finance minister stated in the budget. The finance ministry has allocated Rs4.98bn for information, communication and technology (ICT) development, a big chunk of which will be invested to connect the entire nation to broadband Internet network. According to Nepal Telecommunications Authority (NTA) chairman Digambar Jha, the government has already designated Nepal Telecom to lay optical fiber network in province 1, 2 and 3. The state run telecommunications service provider will cover area starting from Panchthar in the east to Dhading. United Telecom is responsible to initiate the process in province 4 and 5; starting from Gorkha to Rukum. After the first phase of tender call was scrapped, the NTA is currently in the process of choosing the telecom company to undertake the task in province 6 and 7. "We are developing an information highway that'll look like a backbone and gradually evolve to fish bone," Jha explained. This means, the NTA will develop information highway starting from Chiya Bhanjyang in Panchthar to Jhulaghat in Baitadi. After the completion, north-south highway will be connected with main network giving it a shape of fish bone. "We plan to connect all

district headquarters and nearby municipalities with optical fiber network," he said Jha added that the fish bone network, once connects all the major district headquarters, will form a ring of optical fiber network through which Internet network can be established in every nook and corner of the country. Given optical fibre network will ensure high speed connectivity, people living even in the remote areas can access voice, video and data service through this network cutting off sole dependency on satellite based network. "Places which do not have telecom tower will be provided with microwave link based network," Jha said. The task of connecting 14 earthquake affected districts with broadband Internet too is being expedited, the NTA stated.

(June 12, 2017) gulf-times.com

The Nepal Telecommunications Authority (NTA) has reversed its decision to give Ncell a 4G license. The second largest cellco in Nepal had finally been granted permission from the regulator to launch a 4G LTE network across the country. The move was controversial, however, as the Public Accounts Committee (PAC) advised the NTA against awarding Ncell with a 4G license until it had paid its outstanding debts. Despite initially not heeding the advice of the PAC, the NTA has now relented and said it would abide by the fresh directive from the PAC to bar Ncell from launching a 4G service until it had paid the capital gains tax it owed following Telia Company's sale of its stake in Ncell to Malaysian company Axiata. The NTA had previously stated that Ncell could activate its 4G network from 1 June 2017, however, this will no longer be the case.

(May 30, 2017) The Nation

Nepal



Pakistan

Pakistan ended May with 140.5 million mobile subscribers, up from 139.6 million in April, according to data from Pakistan Telecommunications Authority (PTA). Mobile operator Mobilink led the Pakistani mobile market with over 52.88 million mobile customers at end-May, followed by Telenor (40.90 million), CMPak (28.21 million), and Ufone (18.50 million).

(June 20, 2017) telecompaper.com

Pakistan added 688,897 3G/4G subscribers in April, ending the month with over 40.56 million 3G/4G subscribers, up from 39.88 million in March, according to a report from Pakistan Telecommunications Authority (PTA). Mobilink (Jazz) led the 3G/4G market with over 13.3 million subscribers, followed by Telenor (10.9 million 3G and 4G subscribers), CMPak (11.4 million 3G and 4G subscribers), and Ufone (4.8 million 3G subscribers).

(June 2, 2017) telecompaper.com

Cellular companies operating in the country have thanked Minister of State for Information Technology and Telecommunication Anusha Rehman for making concerted efforts to promote the telecom industry in the country. In a joint letter written to the minister, the telecom companies including PTCL, Jazz, Telenor, Ufone and Zong thanked the minister for extending outstanding support to the industry in seeking relief on various tax issues in the Federal Budget 2017-18. They said it was the result of the collaborative efforts made by the Ministry and Pakistan Telecommunication Authority (PTA), under the leadership of Anusha Rehman, that the Industry had been granted some relief on Withholding Tax and Federal Excise Duty. They said the telecom industry has always been encouraged

by the present government's progressive and empowering support, which is acknowledged by all stakeholders. "This is just the start of creating a positive enabling environment for the sector. There are still some outstanding taxation issues that will require us to work together. As you very kindly offered, and as the Finance Minister stated during his budget speech, we request your continued support for raising the harmonization of tax issues with the provinces." They said the model of public-private collaboration, set up by the Ministry, would be a source of mutual benefit to the government, the industry and ultimately to the people. (June 6, 2017) pakobserver.net

Ministry of Information Technology and Telecommunications (MoIT) is formulating a proposed Digital Pakistan Policy 2016-17 to rapidly transform the IT and related sectors of economy. The Ministry will submit the said policy document to ECC for its approval. The basic objective of the policy is to take into account the increasingly transformed role of Information Technology (IT) across all sectors of socio-economic development, accelerated digitization and a holistic knowledge based economy. According to an official document issued here, this policy would serve as foundation of a holistic Digital Eco-system with advanced concepts and components for rapid delivery of next generation digital services, applications and content. It will also provide opportunities for local entrepreneurs and firms to acquire core competencies, experience and credibility and better position them to compete at international level. During first three quarters of this fiscal year, extensive stakeholders' consultations including inter-division, as per rules of business were undertaken in form of meetings, workshops and seminars.

(May 30, 2017) pakobserver.net



Saudi Arabia

Ethiad Atheeb (GO Telecom) has been awarded spectrum in the 700MHz and 1800MHz bands by telecoms regulator the Communications and IT Commission (CITC). The company secured 2x10MHz in the 700MHz band, in addition to a paired 10MHz block in the 1800MHz band, for SAR2.065 billion (USD550 million). The spectrum concession is valid for 15 years, effective January 1, 2018. The company must pay 30% of the license fee by the end of 2017, with the remainder to be paid in equal instalments (7% of the total each, with the first instalment due in 2019) over ten years. (June 12, 2017) teleogeography.com

The telecoms regulator the Communications and IT Commission (CITC) has awarded additional spectrum in the 700MHz and 1800MHz bands to mobile operators Saudi Telecom Company (STC), Zain Saudi Arabia and Ethiad Etisalat (Mobily), following an auction which was held on May 23. STC secured a 2x15MHz block in the 700MHz band and additional 8MHz block of paired spectrum in the 1800MHz band for a total of SAR2.507 billion (USD668 million); the concession is valid for a period of 15

years, effective January 1, 2018. The company is required to pay 30% of the license fee by the end of 2017, with the remainder to be paid in equal instalments (7% of the total each, with the first instalment due in 2019) over ten years. Zain Saudi Arabia, meanwhile, secured 2x10MHz in the 1800MHz band for SAR844 million; the company said that the new spectrum will boost its LTE network capacity by 50%, while also enhancing service quality. Zain will pay SAR253 million (30%) of the license fee by the end of 2017, with the remaining amount to be paid in instalments of SAR59.1 million per year over a ten-year period. For its part, Mobily revealed that it was awarded a 2x5MHz paired block in the 1800MHz band for SAR422 million, with 30% of the sum scheduled to be paid within ten days of concluding the auction; the rest is to be paid in equal instalments over a ten-year period. The additional spectrum will be available in the beginning of 2018, and will allow Mobily to increase its network capacity, improve its customers' experience and contain its future capital expenditure. (June 8, 2017) teleogeography.com



Sri Lanka

Sri Lanka is devising a digital economic strategy with the assistance of a worldwide management consulting firm in order to successfully face future economic and social challenges, official sources said. A digital economy refers to an economy that is based on digital computing technologies. This ambitious initiative fundamentally seeks to ensure that public financial services are made available to citizens, in electronic form, by improving online infrastructure and increasing Internet connectivity. A Cabinet appointed negotiation committee will be set up for procuring McKinsey & Company, a worldwide management consulting firm, as an external consultant at a fee of US\$1.5 million for approximately 11 weeks. This was revealed at the recent Cabinet Committee on Economic Management (CCEM) meeting where it was suggested that this consulting firm should prioritize and launch one or three flagship programmes and prepare project charters for up to 10 projects. McKinsey & Company conducts qualitative and quantitative

analysis in order to evaluate management decisions across the public and private sectors. The digital economic strategy is to be developed through the collaborative efforts of the Ministries of Telecommunications and Digital Infrastructure and Development Strategies and International Trade. An additional budgetary allocation of \$1.7 million will be made to the Ministry of Telecommunications and Digital Infrastructure for the consulting cost and maintaining the coordinating office during the period 2017/2018 to accelerate the digital economy efforts. The CCEM also directed the two ministries to work collaboratively and expedite the implementation of the digital economy initiatives. Key areas the government is focusing on were digital connectivity, a National Digital Identification for all citizens, a national payment platform, a single platform for the government to connect, digital security, digital legislation and digital education, according to Minister Harin Fernando.

(June 12, 2017) sundaytimes.lk



Tunisia

The National Telecommunications Authority (Instance Nationale des Telecommunications, INT) has issued a new ruling setting quality of service (QoS) requirements for the nation's wireless providers. Decision Coll/Reg/2017/12 also determined specific protocols for taking measurements for QoS indicators, and requires operators to publish coverage maps for their 3G and 4G service areas, which will be confirmed independently by the watchdog. The decision sets out requirements for operators on

network coverage, 2G and 3G voice services and 3G/4G mobile data services, as well as providing clear definitions for each indicator. Notably, the INT decision sets commitments for 3G and 4G data speeds, requiring providers to offer minimum average download speeds of 4Mbps by March 29, 2019, 7Mbps between March 29, 2019 and March 29, 2021, and 10Mbps thereafter for 3G networks, whilst average 4G speeds must reach 10Mbps, 20Mbps and 30Mbps within the same timeframe.

(June 9, 2017) telegeography.com



United Arab Emirates

The Telecommunications Regulatory Authority (TRA) in the United Arab Emirates (UAE) said on Monday that mobile phone usage in the Gulf Arab state increased to 228.3 devices per 100 people as of March 2016, state news agency WAM reported. The TRA in Abu Dhabi did not release comparative figures from previous years. However, it was revealed that there was an increase in the number of telecom subscribers in March 2017, by more than 132,000 new subscriptions compared to February. "This led to a jump in the total number of cumulative subscriptions to 19.835 million," said the report. The authority added largest increase in subscriptions was registered in

prepaid mobile phone services, which gained around 104,000 new subscriptions in March, while contract services increased by 28,000 subscriptions during the same period. The UAE occupies the first position in the Arab region in terms of the readiness of its telecommunications networks, according to a study published by the World Economic Forum in 2016, and 26th position globally among 139 countries. The network readiness index measures the capacity of an economy to benefit from information and communication technology, to increase competitiveness and development, said the report.

(May 30, 2017) newsghana.com.gh

REGULATORY ACTIVITIES BEYOND THE SAMENA REGION



Australia

The telecoms regulator ACMA has launched public consultation on use of the 3.6-GHz band for 5G services. The consultation seeks to determine the right balance between facilitating use of the band for 5G and other wide-area broadband users while protecting the interests of existing users of the spectrum. Proposed mitigation measures include making 5.6-GHz band spectrum available to point-to-multipoint users including wireless ISPs, and establishing earth station protection zones to facilitate ongoing use of the 3.6-GHz band by satellite services. ACMA said its current preferred option is to make spectrum in the band available in metropolitan

and regional areas for new service. The regulator will conduct a detailed assessment of the highest value use of the band before making its final decisions. "In line with our established mobile broadband strategy, we want to make sure Australia is well placed to take advantage of the emergence of 5G technologies both in the cities and the regions," ACMA acting chairman Richard Bean said. "The ACMA acknowledges the strong interest in the 3.6 GHz band for 5G and other wide area broadband uses, while also recognizing that there are existing services and licensees using these frequencies that want to continue operating."

(June 27, 2017) telecomasia.net



Belgium

Just over a year after securing a 3.5GHz wireless license, Broadband Belgium has handed its concession back to the Belgian Institute for Post and Telecommunications (BIPT). A company spokesman confirmed the transfer had, in fact, taken place last month, on May 18. Broadband Belgium had previously planned to use time division duplex LTE (TD-LTE) to offer fixed-wireless internet access to business and residential users in 16 metropolitan areas across

Belgium, after acquiring 3.5GHz spectrum from struggling ISP b-lite last year. Notably, it had been granted a five-year extension to its license in March this year. The Belgian government sees 3.5GHz frequencies as crucial for the development of 5G, and an auction is currently being prepared for a total of 400MHz of spectrum between 3.4GHz and 3GHz.

(June 15, 2017) telecompaper.com



Benin

The Electronic Communications & Postal Regulatory Authority (ARCEP) has opened sanction procedures against mobile network operators MTN, Moov and Globacom (Glo), alleging breaches of quality of service (QoS) standards (in the case of MTN and Glo) and, in Moov's case, failing to comply with network

security specifications to protect against fraud on incoming international traffic. The regulator's actions follow two warnings given out earlier this year, whilst it stated that any necessary penalties will be issued in 15 days.

(June 12, 2017) telegeography.com



Brazil

Regional Brazilian operator Algar Telecom has successfully refarmed a portion of its 1800MHz 2G spectrum for 4G LTE use, TeleTime reports. The news site notes that subscribers in 14 cities are now able to use the 1800MHz band for 4G services, including: Franca (Sao Paulo); Itumbiara (Goias); and Arapora, Carmo do Paranaiba, Frutal, Iturama Serrana, Para de Minas, Patos de Minas, Prata, Santa Vitoria and Uberaba (all Minas Gerais). The remaining cities have not yet been identified. In the 1800MHz band, 5MHz of Algar's 10MHz spectrum allocation has been refarmed, the report adds. The 1800MHz LTE

coverage augments Algar's existing 700MHz 4G networks, which were launched in the mining cities of Uberlandia and Ituiutaba in November 2016. The 700MHz network is expected to be extended to other areas as and when the spectrum is freed up by the country's broadcasters. Previously, on 30 September 2014 Algar paid BRL29.57 million (USD8.5 million) for 700MHz spectrum covering 87 municipalities in the states of Goias, Minas Gerais, Mato Grosso do Sul and Sao Paulo. In April 2015 the telco selected Finnish equipment vendor Nokia for the deployment of its 4G network. (June 13, 2017) telegeography.com



Canada

The Canadian government said it was directing the country's telecommunications regulator to reconsider a recent decision it says excludes Wi-Fi-based providers from broadening their access via other companies. Innovation Minister Navdeep Bains said in a speech a decision made by the Canadian Radio-television and Telecommunications Commission (CRTC) in March effectively prevents such providers from offering their low-cost plans. The CRTC ruled then that wireless startup Sugar Mobile, an affiliate of Ice Wireless, could not continue to use Rogers Communications Inc's network to keep customers connected outside the reach of Sugar's wireless network. The CRTC ruling said that Ice Wireless had improperly allowed Sugar users to obtain permanent access to Rogers' cell network. The regulator also said in a simultaneous decision that mandated wholesale roaming agreements between companies provide incidental, not permanent, access to cell networks. Critics said at the time the decision was a blow to low-income Canadians. Bains told the Canadian Telecom Summit in Toronto the Wi-Fi-based model could benefit Canadian consumers, particularly those who are less well-off. "This lack of choice does not benefit Canadians," Bains said. "For this reason, I am directing the CRTC to rethink its decision and reconsider the Wi-Fi first model." Bains said he was asking the regulator to launch a new examination of the subject. Shares of Rogers were little changed, recently trading at C\$63.22. Advocacy group OpenMedia said it was "excited" that the CRTC will revisit the issue. "Allowing smaller providers to enter the market will improve innovation, encourage competition and enable low-income Canadians

to participate more fully and meaningfully in our digital society," OpenMedia's Katy Anderson said in a statement. The government is also launching a public consultation on releasing spectrum to support the development of 5G, wireless networks, Bains said, though he did not specify a timeline. 5G networks are expected to have higher speeds and more capacity. The 5G market is expected to be worth C\$36 billion.

(June 6, 2017) telecom.economicstimes.indiatimes.com

The telecommunications regulator says it will require companies to update their networks to be ready to provide so-called next-generation 911 services by the end of 2020. The CRTC will also decommission existing 911 networks by the middle of 2023 in an effort to encourage municipal, provincial and territorial governments to make the transition. The regulator says the new services, which will allow people to send text messages to emergency services, will be made available as emergency call centers are able to offer them, though it will be up to local governments to decide whether the centers within their jurisdictions will do so. The CRTC is also asking Public Safety Canada to help ensure a smooth transition by establishing a national co-ordination body of call centers and emergency responders. The ability to communicate with emergency call centers via text message, including photo and video, would, for example, allow people to send footage of accident damage or fleeing suspects. The decision is the result of proceedings launched by the CRTC last year to establish a regulatory framework for next-generation 911 services.

(June 4, 2017) cp24.com



China

The telecoms regulator the Ministry of Industry and Information Technology (MIIT) has launched an open consultation on the possible use of millimeter wave (mmWave) spectrum in the 24.75GHz-27.5GHz and 37GHz-42.5GHz ranges for 5G services. The MIIT has requested feedback on a range of matters to help improve frequency planning for the bands. As such, the regulator has invited parties to submit information regarding: proposed uses for the

spectrum; key technical problems; advice on how to plan the blocks for 5G systems; and any compatibility and coexistence research that has already been carried out on the band. The deadline for submissions is 7 August 2017. The announcement follows on the heels of another 5G spectrum consultation opened by the MIIT earlier this week, which focused on several sub-6GHz frequency ranges.

(June 9, 2017) telegeography.com



Croatia

The European Commission (EC) has approved a EUR101.4 million (USD114 million) scheme by the government of Croatia to roll out shared broadband infrastructure in underserved rural areas of the country. The EC decided that the project, which aims to provide NGN backhaul connectivity in regions which are uneconomical for private operators, is in line with EU state aid rules. The new infrastructure will be financed mainly through the European Regional Development Fund and partly by national funds, and the network will remain in public ownership via state transmission company OIv. The scheme, which is set to be completed by end-2023, aims to increase

the coverage of high speed broadband and provide symmetrical speeds of 100Mbps. Commissioner Margrethe Vestager, in charge of competition policy, said: 'Croatia's broadband scheme will bring faster internet to consumers and businesses that currently do not have it. It will help Croatia to put in place the necessary infrastructure for an information society and contribute to creating a Digital Single Market within the EU.' In January 2016 the EC approved a government plan to roll out next generation access (NGA) infrastructure in underserved areas of Croatia. The latest scheme will provide backhaul connectivity for the access networks. (June 7, 2017) telegeography.com



European Union

The European Commission late last week opened an in-depth investigation into Qualcomm's \$47 billion (€42.96 billion) acquisition of NXP. The antitrust watchdog is concerned that the tie-up could limit competition in the baseband and near-field communication (NFC) chipset markets, and the budding vehicle-to-everything (V2X) market. The Commission is also concerned that Qualcomm would have the means and incentive to modify NXP's patent-licensing practices, potentially leading to higher royalties, and excluding rivals. Qualcomm agreed in October 2016 to buy NXP, which became the world's biggest supplier of semiconductors to the automotive industry after it bought Freescale for \$11.8 billion. As well as complementing its mobile processor and modem businesses, the deal also gives Qualcomm a strong position in the markets for security, network processing and RF power, and IoT semiconductors. "As semiconductors are used in practically every electronic device, we are dependent on them in those devices. With this investigation, we want to ensure that consumers will continue to benefit from secure and innovative products at competitive prices," said competition commissioner Margrethe Vestager, in a statement. The Commission said it will conclude its investigation and issue a decision on the deal by October 17. (June 12, 2017) totaltele.com

The European Union (EU) could levy a record fine against Google if the European Commission (EC) concludes the company manipulates search results to promote its own shopping comparison service. An EC ruling is expected in a matter of weeks as Competition Commissioner Margrethe Vestager aims to draw a line under an investigation before the EU breaks up for the summer, Bloomberg reported. Due to a desire to make a point, the fine against Google could exceed a \$1.2 billion penalty placed on Intel in 2009, which remains the bloc's biggest fine for monopoly abuse to date. Google parent Alphabet posted revenue of \$90 billion in 2016, which means a fine would be capped at \$9 billion and will be calculated from sales in the market under investigation. Google itself generated \$79 billion in ad revenue in 2016, and while the amount generated from shopping search advertising is unknown, it is likely to be a big chunk of the figure. In addition to revenue, the EU will also take into account the number of years Google manipulated its search, which regulators estimate began in 2008, when calculating any fine. Stephen Kinsella, a lawyer at Sidley Austin representing companies which complained to the EU about Google, told Bloomberg: "The European Commission has strongly signaled that if there is going to be a fine it would need to be at a level that would have deterrent effect." Google hasn't met with regulators to discuss a potential

EU order or how it might implement any changes, Bloomberg said. The tech giant's AdSense advertising service and Android mobile phone software are also being investigated. In 2016, Vestager accused Google of "stifling competition and innovation" by using Android to impose unfair restrictions on device manufacturers and operators. Vestager is known for taking a hard stance, imposing a €110 million fine on Facebook in May for providing "incorrect or misleading" information in 2014 regarding its \$20 billion acquisition of WhatsApp. Previous reports pegged the fine Google may face at between €3 billion and €6.6 billion. The company would have the right to appeal any fine, though the process could take years. Microsoft only won a 4 per cent cut to an EC fine using the appeal process, while Intel is still waiting on a decision. In December 2016 Apple and the Irish government outlined their grounds to challenge an EC decision to make the company pay €13 billion plus interest in back taxes to the country.

(June 12, 2017) totaltele.com

The EU this week reached a deal to spend an initial €120 million rolling out free-to-use WiFi hotspots in public spaces. Called WiFi4EU, the initiative was unveiled in September 2016 alongside the Electronic Communications Code (ECC), which forms part of the EU's over-arching Digital Single Market (DSM) strategy. On Monday, the European Commission, Council and Parliament agreed on the budget, which will fund the deployment of free public WiFi hotspots in 6,000-8,000 municipalities in all member states. "The Digital Single Market Strategy aims to build a fully connected Europe where everyone has access to high-quality digital networks. The WiFi4EU initiative will improve connectivity in particular where access to the Internet is limited," said the EU's DSM vice president, Andrus Ansip. If a local authority wants to take advantage of WiFi4EU, they can apply for a grant in the form of vouchers that will pay for the purchase and installation of WiFi access points. The local authority will need to cover the cost of operating the hotspot. It is hoped that initiatives like WiFi4EU and the ECC will help the EU to reach its goal of providing symmetric gigabit connectivity to every school, university, research facility, transport hub, hospital, administrative building, and digital business by 2025. The EU also wants every household to have access to 100-Mbps broadband services that are upgradeable to 1 Gbps. "WiFi4EU is a welcome first step, but much more needs to be done to achieve high-speed connectivity across the whole EU territory – such as improving Europe-wide coordination of spectrum and stimulating investments in the high-capacity networks that Europe needs," Ansip said.

(May 31, 2017) totaltele.com



Finland

Four of Finland's mobile operators have been authorized to apply surcharges to their subscribers' roaming consumption in EU and European Economic Area (EEA) countries, following the introduction of new roaming rules that entered into force. In a press release, local telecoms watchdog the Finnish Communications Regulatory Authority (FICORA) confirmed that Telia Finland, Elisa, DNA Finland and Moi Mobiili will all be permitted to levy surcharges. The regulator noted, however, that it will be up to the providers themselves to decide whether to actually do so, either in full or in part. In announcing its decision, the FICORA pointed to the fact that under

the new EU roaming regulations operators can ask for authorization to apply surcharges if offering roaming without additional charges to consumers could cause unreasonable financial losses. As per the regulations, losses are considered unreasonable if they are more than 3 % of the operator's mobile services margin. Meanwhile, outlining its reasoning for approving the authorizations, the regulator said that such a move would 'ensure that the new roaming rules do not undermine the sustainability of the domestic charging model and lead to a higher domestic price level or changes in the provision of unlimited data packages'. (June 16, 2017) telegeography.com



France

French telecoms regulator ARCEP has revealed plans to allocate a portion of the 3.5GHz (3400MHz-3800MHz) band for 5G use, and it aims to begin the frequency allocation procedure in September 2017. In order to accommodate the allocation of the frequencies for 5G use, ARCEP said that existing allocations will be regrouped in the form of contiguous blocks towards the bottom of the band. This configuration will make it possible to have more than 300MHz of contiguous spectrum available for 5G by 2020, and 340MHz by 2026 (390MHz in places where the frequencies are not being used for superfast wireless systems). Meanwhile, a sub-band of 80MHz (3600MHz-3680MHz) has been identified as suitable for conducting 5G trials, with such spectrum to

be awarded in a timely fashion to any player that requests it. Due to the temporary restrictions imposed by other users of these frequencies, ARCEP has identified Lyon, Nantes, Lille, Le Havre, Saint-Etienne and Grenoble as the cities where 5G trials could be performed. To be able to satisfy the two requirements identified as urgent in its two-month consultation on the topic (which ran until March 2017), ARCEP also confirmed that it will be using a portion of the 3.5GHz band to upgrade wireless local loop (WLL) networks to superfast wireless networks, while spectrum in the 2.6GHz (2570MHz-2620MHz) time division duplex (TDD) band will be used to upgrade professional mobile radio (PMR) networks.

(June 26, 2017) telegeography.com



Germany

The federal network regulator Bundesnetzagentur has published a framework document for mobile spectrum that can be used for 5G services. The document aims to ensure more investment and planning security while identifying possible frequencies that can be

used for 5G services. At the same time, the regulator calls on interested companies to show their interest in the spectrum ahead of a possible auction in 2018.

(June 28, 2017) telecompaper.com



Ghana

Six cellcos, including Airtel Ghana, Tigo Ghana and Expresso, have been instructed to expand their networks to cover the Adaklu district of the Volta region within the next six months or face sanctions, cites Minister of Communications Ursula Owusu Ekuful as saying in parliament. The development follows an order issued by the National Communications

Authority (NCA) in March this year instructing the country's mobile network operators (MNOs) to meet quality of service (QoS) requirements, with a priority of resolving the matter in the capital before rolling out improvements nationwide.

(June 7, 2017) Agence Ecofin



Guyana

Minister of Public Telecommunications Catherine Hughes has warned that negotiations with Atlantic Tele-Network (ATN), the US-based parent company of incumbent operator Guyana Telephone and Telegraph Company (GTT), regarding the end of the latter's monopolies in several markets may not be finalized by the end of July this year, as initially planned. Media cites the official as saying that the talks, which were

initiated in August last year after the passing of the Telecommunications (Amendment) Bill 15/2016, are 'going well' but are likely to overshoot their planned completion date. Mrs. Hughes explained that the process had been delayed by questions over spectrum pricing and the mechanisms for issuing licenses, both of which are set to be handled by a new regulatory body, the National Telecommunications

Agency (NTA), which has yet to be established. Under the current plans for the sector, the NTA will absorb and expand on the powers of one of the existing authorities, the National Frequency Management Unit (NFMU). Further, the involvement of the Guyana Revenue Authority (GRA) in the process has further complicated matters, though the official noted that she could not comment further on that side of talks, as 'GRA is a totally independent agency'. Negotiating an end to GTT's monopolies are a central component of the government's plans to liberalize the nation's telecoms markets, with other key reforms including restructuring the regulatory system. The new head of the commission said she would immediately begin work on hiring professionals with additional skills to accommodate the broader powers of the authority under the new legislation: 'We are on the eve of liberalization, so the Commission is being retooled ... All the necessary directives have to be put in place, because our mandate under the new regulations will expand beyond what is currently in place.'

(June 23, 2017) Kaieteur News

Fixed line monopolist Guyana Telephone and Telegraph Company (GTT) has received temporary approval from sector watchdog the Public Utilities Commission (PUC) to increase rates for basic services, subject to the operator meeting certain rollout and quality of service (QoS) improvement works. The rate increases will come into effect from August 1, but are conditional on the following: GTT must complete the deployment and commercial launch of FTTx services in La Grange; GTT must submit quarterly reports providing detailed appraisal of its progress regarding fixed line rollout, which should be no less than 1,000 lines per quarter, up to 25% of which may be re-issues; and regarding fault-reporting, GTT must provide the regulator with a quarterly report detailing the average time taken to resolve customers' complaints. In terms of the price increases, rates for intra-exchange calls will be increased by 33% – from GYD0.6 to

GYD0.8 (USD0.0028 to USD0.0037) during peak times and GYD0.3 to GYD0.4 during off-peak hours – whilst inter-exchange calls will increase by 10%. Installation costs, meanwhile, will rise from GYD500 for residential customers and GYD1,500 for business users to GYD2,000 and GYD4,000 respectively. Monthly subscription rates are set to rise by 50%, from GYD500 to GYD750 for a basic residential plan, and from GYD1,500 to GYD2,250 for the equivalent business subscription. In explaining its decision, PUC noted that under a 1990 agreement between the GTT's parent company Atlantic Tele-Network (ATN) and the government of Guyana, GTT is entitled to a 15% rate of return on capital dedicated to public use, on the condition of providing universal telephony services. Since the introduction of competition in the wireless segment, however, GTT's overall rate of return has dipped below the 15% threshold, leading it to apply to the PUC in 2014 to increase rates in the fixed sector. The regulator initially refused the increase, on the basis that GTT had failed to hold up its end of the agreement, noting that there are more than 19,000 outstanding applications for land lines. Following a recent hearing, though, the two parties have now reached something of a compromise, with GTT acknowledging that it has failed to meet its license obligations and that it now needs assistance as, according to the PUC: 'enough was not done by [GTT] to retain the position of strength and to try to expand their consumer base.' For its part, the regulator recognized that in order to improve QoS for customers, additional resources will need to be made available for such investment: 'As acknowledged by GTT its reduction in profitability could have been due to a great extent by the entity not meeting the challenges of robust competitive activities, and it is expected that the increases granted herein will motivate the company to accelerate its landline expansion programme and provide quality service to all consumers as we approach the emerging liberalized market.' (June 21, 2017) telegeography.com



Iceland

Iceland's telecoms watchdog the Post and Telecom Administration (Post-og Fjarskiptastofnun, PTA) has completed an auction for LTE-suitable frequencies in the 700MHz, 800MHz, 2100MHz and 2600MHz bands. Four companies – Vodafone Iceland (Fjarskipti), Nova, Siminn and Yellow Mobile – participated in the tender, which raised a total of ISK159.8 million (USD1.6 million). Twelve blocks of technology-neutral spectrum were auctioned off, with the highest bidders announced as follows:

- Block A: 2×10MHz (713MHz-723MHz/768MHz-778MHz), secured by Siminn with a bid of ISK35.0 million
- Block B: 2×10MHz (723MHz-733MHz/778MHz-788MHz), Siminn – ISK35.0 million
- Block C2: 2×5MHz (832MHz-837MHz/791MHz-796MHz), Nova – ISK17.5 million
- Block D2: 2×5MHz (837MHz-842MHz/796MHz-

801MHz), Fjarskipti – ISK17.5 million

- Block E: 2×5MHz (1935MHz-1940MHz/2125MHz-2130MHz), Siminn – ISK5.5 million
- Block F: 2×5MHz (1970MHz-1975MHz/2160MHz-2165MHz), Fjarskipti – ISK5.5 million
- Block G: 2×5MHz (1975MHz-1980MHz/2165MHz-2170MHz), Nova – ISK5.5 million
- Block H: 2×20MHz (2500MHz-2520MHz/2620MHz-2640MHz), Siminn – ISK10.0 million
- Block I: 2×20MHz (2520MHz-2540MHz/2640MHz-2660MHz), Fjarskipti – ISK10.0 million
- Block J: 2×10MHz (2540MHz-2550MHz/2670MHz-2680MHz), Nova – ISK6.0 million
- Block K: 2×10MHz (2550MHz-2560MHz/2670MHz-2680MHz), Nova – ISK6.0 million
- Block L: 2×10MHz (2560MHz-2570MHz/2680MHz-2690MHz), Yellow Mobile – ISK6.3 million.

(June 2, 2017) telegeography.com



India

The Telecom Regulatory Authority of India may look into the possibility of introducing a minimum floor price for voice and data services to restrict massive discounts. This came up at a meeting between TRAI and the CEOs of mobile companies. "The proposal to have a floor price came from one of the incumbent operators as a means to arrest the declining revenues for the industry," said an industry source. Other countries, including Sri Lanka, have had floor price for mobile services and it has benefited the industry in terms of higher revenue realization. Recently, the regulator in Zimbabwe has also introduced a floor price after operators there started offering below cost tariffs, thus hurting the overall industry economics. According to the Zimbabwe regulator, "the floor prices shall go a long way in addressing the apparent underpricing of voice and data services that was characteristic of data bundles and promotions that were being offered by operators. This means the mismatch between the rate of growth in data traffic and data revenues can be addressed to ensure the viability of operators." However, not all support imposing a floor price in the Indian context. "A floor price would mean that consumers won't get the best deal any longer. It also restricts the ability of a new operator like Reliance Jio to wean away subscribers through freebies," said an industry expert. "The incumbent operators are now talking about a floor price after they have been hit by RJio. Until now they were the biggest votaries of forbearance, which means letting market forces decide the tariff, not regulation," said a source close to the RJio camp. "How do you fix the floor price when on 4G network the cost of offering a voice call is substantially lower compared to a 2G network. Whose cost will you take to calculate the floor price?" asked an industry analyst. The operators also raised several other issues during the meeting with TRAI. "The common theme was that telcos want lower levies – lower license fee, lower spectrum charge and more time to pay the spectrum price. They also wanted faster approval of M&A deals," said an industry source. The

operators raised questions on auction design stating that it is flawed as it creates "a Do or Die situation" for operators whose spectrum comes for renewal. They also sought level playing field with over-the-top players like WhatsApp. Newer players wanted a reduction in the Interconnect Usage Charge, or the fee paid by one operator to another. They said the IUC is a subsidy to the existing operator and TRAI should move to bill and keep regime. (June 15, 2017) thehindustan.com

The Telecoms Regulatory Authority of India (TRAI) has published a consultation paper on data speeds for wireless broadband connections, looking at potential ways to improve service quality for subscribers. In the consultation paper, the TRAI notes that 'the surge in the number of broadband connections in the country has also been accompanied by increasing reports of consumer dissatisfaction with the speed of data being provided to them,' but acknowledges that many of the complaints derive from a disconnect between customer expectations and the service received. The TRAI points out, for example, that advertised download speeds are not reflective of the rates experienced by customers. Citing crowd-sourced data collected from its MySpeed portal, the watchdog claimed that many 3G subscribers were receiving download speeds of less than 1Mbps, with actual rates clocking in at as low as 10kbps. As such, the regulator is considering making changes to rules governing the information that must be provided to consumers in advertising material and subscription plan. Whilst the watchdog accepted that minimum speeds would be difficult for operators to guarantee, the regulator suggested that including an average or 'typical' download speed would provide consumers with clarity. Meanwhile, the TRAI is also looking into setting new quality of service (QoS) requirements for mobile broadband services, but recognized that monitoring compliance with such obligations would be problematic, not least of all because of the number of factors potentially affecting a customers' received data transfer rate. (June 2, 2017) telegeography.com



Indonesia

The Ministry of Communications and Information Technology (MCIT) has announced that the bidding rules for the sale of 2.1GHz and 2.3GHz spectrum will now not be released this month, as promised by the Minister of Communication and Information Technology. Board member of the Indonesian Telecommunication Regulatory Body (BRTI), confirmed the development while revealing that there will be a fresh meeting to discuss the tender on June 2. In February 2017 MCIT revealed plans to hold a limited tender of unused spectrum in the 2100MHz and 2300MHz band by the middle of this year. At the time, member went on record as saying that he expected the terms and conditions of the tender process to be made available by end-March,

with the successful winners being unveiled by mid-year. The auction is being limited to existing mobile operators, he noted, with the lower band reserved for 3G services currently used by Telkomsel, Indosat Ooredoo, XL Axiata and Hutchison 3 Indonesia (Tri), while the higher 2.3GHz band will be used for 4G wireless broadband services in certain parts of the country. It is understood that MCIT will reallocate the unused frequencies relinquished by Axis Telecom Indonesia following its takeover by XL Axiata in 2014. In addition, around half of the 30MHz 'free' bandwidth at 2300MHz is also expected to be sold to help operators alleviate a lack of resources – particularly in major cities. (May 30, 2017) telegeography.com



Ireland

The Commission for Communications Regulation (ComReg) has launched a consultation on a draft decision related to price control obligations for bundled services, which it notes relate primarily to price control and transparency obligations for three markets, those being: wholesale local access (WLA) at a fixed location; wholesale central access (WCA) for mass market products; and wholesale fixed voice access and call origination ('FACO'). ComReg is seeking feedback on its preliminary view of the

structure and implementation of a bundles margin squeeze test ('MST'), with its draft decision particularly concerned with ensuring fixed line incumbent air cannot cause a margin squeeze between the price of the regulated wholesale regulated services it offers to alternative operators and the price of its own retail bundles. Interested parties have until July 21, 2017 to make submissions to the regulator regarding to the matter.

(June 13, 2017) telegeography.com



Italy

The government has said it is unhappy with Telecom Italia's plans to push ahead with the rollout of fiber-optic networks which will compete with publicly-funded infrastructure in underserved areas of the country. The telco is rolling out fiber-to-the-cabinet (FTTC) networks in so-called 'white' areas, which are not currently covered by high-speed fixed networks. Reuters reports, however, that the government may claim damages from the operator after it opened tenders for the deployment of fiber-to-the-home (FTTH) systems. The first of these tenders – covering six Italian regions – was won by Enel subsidiary Open Fiber, with recent reports suggesting that the same firm will also win the second group of contracts, covering more than 3,700 communities in ten regions. A third tender, covering three regions, is still to be held.

Telecom Italia took part in the first tender process but complained that the terms were unfair and said it would move ahead with its own separate deployment instead. While the government is angered by Telecom Italia's decision to roll out infrastructure which will compete with the state-subsidized systems, the telco is unrepentant; Chief Executive Flavio Cattaneo told: 'Our investments have already started, we flagged them well in time and according to the law ... we will press ahead.' He added: 'The government's attack is worthy of a 'dirigiste' state (an economic system where the state exerts a strong directive influence over investment). We are a private company and in Italy companies are free to do business.'

(June 19, 2017) La Repubblica



ITU

The ITU said its standardization expert group for 'environment and circular economy', ITU-T Study Group 5, is inviting contributions to its emerging study of the environmental requirements of 5G systems. The first ITU technical report to result from this study offers an initial assessment of the methods and metrics required to evaluate the energy efficiency of future 5G systems. Additionally, ITU-T Study Group 5 is developing a new ITU international standard detailing sustainable power feeding solutions for 5G networks, as well as two new ITU technical reports -- one providing an analysis of 5G systems resistibility and the other an analysis of electromagnetic compatibility (EMC) aspects and the definition of requirements for 5G mobile systems. "ITU-T Study Group 5 is taking a proactive approach to the environmental

sustainability of emerging technologies," said Chaesub Lee, director of the ITU Telecommunication Standardization Bureau. "This work will contribute to the environmental sustainability of the ICT sector as well as the many other industry sectors scaling-up their application of ICTs as enabling technologies to increase efficiency and innovate their service offerings." ITU-T Study Group 5 will also develop energy efficiency metrics and measurement methodologies for 5G industry players. The group will contribute to the reliability of 5G systems by ensuring their resistibility to electromagnetic disturbances such as those caused by lightning, while the group's development of EMC requirements will support the interference-free operation of 5G systems.

(June 20, 2017) telecomasia.net



Kenya

Kenya's high court has struck down a legal amendment that critics said curbed the local telecoms regulator's ability to manage competition in the sector. The Communications Authority of Kenya (CA) will now be able to monitor dominance in the sector and punish players who abuse their size, following a court ruling restoring these powers to the regulator. According to the news agency, the court was ruling on a case brought by a private citizen challenging

the amendments. Previously, in December 2015, the government changed sections of the law, requiring the CA to consult the Competition Authority of Kenya (CAK), before punishing any operator for abuse of dominance. The change in law was contained in an omnibus Statute Law (Miscellaneous) Amendment Act, 2015 that was passed by parliament and signed into law by President Kenyatta in December 2015.

(June 9, 2017) reutersafrica.com



Maldives

Ooredoo Maldives announced the results of its initial public offering (IPO) which it launched in April. A total of 14,044,870 shares will be issued to 8,219 applicants, raising MVR421.35 million (USD26.50 million) and constituting 9.5% of the issued paid-up shares of Ooredoo Maldives. The fixed and mobile operator, majority owned by Qatari firm Ooredoo

Group, had offered up to 22.17 million issued Ordinary Shares (representing a 15% stake) to Maldivian and international institutional investors, as well as retail investors, at a price of MVR30.0 per share; 63.4% of the shares on offer were taken up. The shares are scheduled to be listed on the Maldives Stock Exchange (MSE) on or before August 10, 2017.

(June 19, 2017) telegeography.com



Myanmar

Local telecom operators can now to utilize the 1800MHz spectrum that has been allocated to them by the Posts and Telecommunications Department. Telecom operators also said that networks will be expanded to 4G by using that spectrum. Myanmar Posts and Telecommunications (MPT), Telenor Myanmar Limited, and Ooredoo Myanmar Limited were granted permission by the Posts and Telecommunications Department that falls under the Ministry of Transportation and Communications, to use the band. The Department had granted permission to use the 2x10MHz that comes with a 12-year validity license, on May 15. According to the Ministry's official webpage, permission was granted to mobile operators which have acquired nationwide telecommunications license. It also said that the operators will have to pay a fee of US\$80million in order to use the band. Meanwhile, MPT announced on Monday that with the rights obtained to utilize the Ministry's designated 1800MHz/1.8GHz, it will also be expanding its network to 4G. It said that user can expect faster data initially in Nay Pyi Taw, Yangon, and Mandalay. It added that 4G services will be available in other cities in the near future. It advised MPT subscribers who are currently using the 2G/3G SIM cards, to exchange them free-of-charge to the 4G-ready cards. Subscribers will retain their numbers and can make the exchange at the nearest MPT branded stores in Nay Pyi Taw, Yangon, and Mandalay. The 4G network can be accessed by switching the network in phone's setting to '4G/LTE'.

Telenor Myanmar, which previously received the rights to use the 2100MHz and 900MHz spectrum, brought the 4G network to 19 cities. Now, the 4G network can be extensively provided after receiving the rights to utilize the 1800MHz spectrum, said CEO, Lars Erik Tellmann. "Telenor is doing its best to be able to provide 4G/LTE network from the 1800MHz spectrum. In a short while, we hope that this coverage will be available in more cities," said Tellmann. Meanwhile, Ooredoo Myanmar had introduced the 4G network in Yangon, Mandalay, and Nay Pyi Taw from May 2016. In January 2017 the network was been expanded to include the Magwe Region. LTE is an abbreviation for 'Long Term Evolution', which means it is a 4G/LTE data rate that is faster than 3G. More data can be easily accessed and utilized to download items in a short time. Games can be played with a smoother experience, HD videos can be shared rapidly, and online content can be accessed quickly with the faster data transfer rates. Toshitake Amamiya, CEO of MPT-KSGM Joint Operations said, "With the 4G technology, data downloads can be completed in a short time, games can be experienced with a smoother frame rates, HD videos can be shared quickly, and online contents can be accessed in a flash. "Moreover, if you want to use 4G/LTE, the price charged will be the same as the Colourful Data Pack program, as well as the original 3G data and all call rates." Currently, MPT has over 25 million users, Telenor about 19 million, and Ooredoo has nine million.

(May 31, 2017) mmtimes.com



New Zealand

The Communications Minister Simon Bridges has formally unveiled the final details of the Government's reform package to improve the Telecommunications Act and modernize the communications sector. The final package will introduce a more predictable utility-style model for Ultra-Fast Broadband (UFB) fiber, deregulate copper lines where fiber is available, and improve the quality of service (QoS) for mobile customers by increasing regulatory oversight. Bridges commented: 'UFB is already available to more than one million homes and businesses in New Zealand, and over 85% of New Zealanders will be able to access the high speed network by 2024. As the

copper network is essentially being replaced by UFB, it is appropriate that copper regulation be removed from 2020. It makes sense to focus on the services that most people will be using. However, to make sure people are protected, copper will continue to be regulated outside of UFB coverage areas. Safeguards will also be put in place to make sure that customers do not lose their copper landline unless there is an alternative service available at a comparable price and service level.' The new regime is expected to be implemented from 2020.

(June 9, 2017) telegeography.com



Netherlands

Henk Kamp, the Netherlands' Minister of Economic Affairs, has told MPs that the government plans to scrap its existing strict interpretation of net neutrality principles. In response to a question in parliament, Mr. Kamp said that the relevant article would be removed from the Telecommunications Act, having been ruled to be invalid or irrelevant by a Rotterdam

court in a recent court case over operators' apparent flouting of the net neutrality principles with their 'zero rated' mobile data content package and promotions for selected online applications. The minister did not suggest a timeline for the amendment.

(May 31, 2017) telecompaper.com



Nigerian

The Communications Commission (NCC) plans to auction off the five remaining 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 – next month. The Guardian cites a report by the News Agency of Nigeria as saying that around 60 companies have applied to compete in the licensing

procedure, which NCC Executive Vice Chairman Umar Danbatta expects to be completed in July. MainOne Cable and IHS secured the first two concessions – for Lagos State and the North Central Zone, respectively – back in January 2015 and under the second phase of licensing, permits will be awarded for the five remaining zones: North East, North West, South East, South West and South.

(June 21, 2017) telegeography.com



Norway

The Norwegian Communications Authority (Nkom) has recommended that all available frequencies in the 700MHz band should be usable by commercial mobile operators, when they become available. In a press release the regulator said it did not believe that dedicated spectrum needed to be set aside for the emergency sector. In November 2015 the Norwegian authorities determined that 700MHz frequencies will be used for mobile services, and the Nkom aims to allocate 2x30MHz of spectrum in the band by the end of 2018. Meanwhile, the Nkom is also seeking feedback on possible solutions for the improved provision of indoor mobile coverage. To that end, the regulator is consulting on plans to assign spectrum in the 2GHz band (1920MHz-1980MHz/2110MHz-2170MHz), and has requested submissions regarding the matter by a deadline of July 21, 2017.

(June 9, 2017) telegeography.com

The National Communications Authority (Nkom) has named Telia Norge and Telenor Norge as the two winners of the 900MHz spectrum auction that got underway last week. Both mobile network operators (MNOs) successfully bid for two new blocks of spectrum apiece, with Telenor agreeing to pay the most, having offered NOK396 million (USD47 million) for a total of 2x10MHz in the band in question. For its part, Telia will have to find marginally less, after agreeing to pay NOK394 million in a sale process which saw bidding conducted over 29 rounds. The Nkom has confirmed that the two operators will now negotiate the final frequency allocations, with discussions regarding the actual placement of blocks in the band expected to last for up to four weeks.

(May 30, 2017) telegeography.com



Peru

The Ministry of Transport and Communications (MTC) has announced that it is increasing the number of regional broadband projects to be awarded by the end of 2017 to seven. Vice Minister of Communications Carlos Valdez told an intergovernmental commission that the projects would cover Junin, Puno, Moquegua, Tacna, Lima, Ica and Amazon and that the projects had already been sent to the Agency for the Promotion

of Private Investment (Agencia de Promocion de la Inversion Privada, ProInversion) to begin the award process. Meanwhile, the official added that construction is expected to start in Q4 2017 for regional projects in Lambayeque, Huancavelica, Ayacucho, Apurimac, Cajamarca, Cusco, Piura and Tumbes.

(June 5, 2017) telegeography.com



Senegal

The telecoms regulator ARTP awarded three MVNO licenses following the call for applications issued in April. Out of nine applicants, the three companies selected by the regulator – You mobile, Sirius Telecoms Afrique and Origines SA – will use the

networks of Sonatel, Tigo and Expresso respectively. In its application, You mobile offered XOF 400 million, while the bids of both Sirius Telecoms Afrique and Origines SA amounted to XOF 300 million.

(June 14, 2017) Agence Ecofin



Somalia

The Somali cabinet has unanimously passed the draft National Communications Act, which aims to establish the legal, regulatory and institutional frameworks for the country's thriving telecoms sector. The draft legislation was submitted by the Ministry of Posts, Telecommunications and Technology, which in recent months has held consultations on the proposed Act with various stakeholders, including regional states, telecoms operators and ISPs. 'The

most important and urgent issue the industry needs is an effective regulatory framework. Once passed by the Parliament, the Act will open a lot of opportunities for the sector and help us protect our investors both locally and internationally,' commented Minister for Posts, Telecommunications and Technology, Abdi Ashur Hassan. The draft National Communications Act is scheduled to be among the first bills to be submitted to Parliament when it reopens in July.

(June 26, 2017) Mareeg Media



South Africa

South Africa's telecoms regulator the Independent Communications Authority of South Africa (ICASA) is considering cancelling four licenses issued to Enverge Communications (awarded in 2011), Pluto Internet (2011), OpenVoice Service Providers (2009) and Global Technology Solutions (2009). The regulator said the decision to cancel all untraceable and/or inactive licenses 'follows a number of

fruitless attempts by the office of the Complaints and Compliance Committee to make contact or determine the activities of these licensees following allegations of non-compliance with their terms and conditions.' The four companies have been given until July 31 to inform the regulator that they are actively using the concessions.

(June 28, 2017) telegeography.com



Switzerland

Swiss telecom watchdog the Federal Office of Communications (Ofcom) has launched a public consultation regarding the allocation of new mobile radio spectrum due to become available from 2019. The consultation paper covers spectrum in three new bands – 700MHz, 1400MHz and 3400MHz-3800MHz – which have been identified as potentially compatible with future 5G technologies, as well as a single unused 2x5MHz block of 2600MHz spectrum (2565MHz-2570MHz/2685MHz-2690MHz). Ofcom has sought opinions of interested parties on the distribution of the airwaves, setting a deadline of 31 July 2017 for submissions. In the 700MHz band, 2x30MHz of spectrum (703MHz-733MHz/758MHz-788MHz) and 20MHz of downlink-only spectrum (738MHz-758MHz) will become available from 2019, although the regulator is considering reserving a portion of airwaves for a public safety network. A maximum of 91MHz of downlink-only frequencies will become available in 2019, though use of the upper (1492MHz-1518MHz) and lower (1427MHz-1452MHz) tranches may be limited, leaving just the 40MHz central block (1452MHz-1492MHz).

Finally, the 3400MHz-3800MHz range also presents problems. Ofcom notes that the current plan for the spectrum is to reserve the airwaves for regional broadband wireless access (BWA) concessions, but discussions regarding the matter are ongoing. At present, only one company holds a license for spectrum in the band and, although the concession is due to expire at the end of 2017, the operator wishes to continue operating in the band. Meanwhile, the range is also of interest for use for other applications on a temporary basis, with Ofcom adding that it is difficult to find alternative bands for use during major events, such as the Tour de France and Tour de Suisse. Further complicating the matter, the 3600MHz-3800MHz is currently used by land-based satellite stations, potentially restricting its availability for use with mobile networks. The watchdog is considering carving up the range into either a 190MHz block of time division duplex (TDD) spectrum at 3410MHz-3600MHz or 160MHz (2x80MHz) of frequency division duplex (FDD) spectrum at 3410MHz-3490MHz/3510MHz-3590MHz, plus a 200MHz block of TDD spectrum at 3600MHz-3800MHz.

(June 1, 2017) telegeography.com



Sweden

The government has announced a decision to reassign a portion of the 700MHz band for mobile broadband use from November 1, 2017, with the Swedish Post and Telecom Agency (Post & Telestyrelsen, PTS) now expected to start preparing the terms and conditions of the forthcoming spectrum auction. Karoline Bostrom, head of the unit for spectrum licenses at the PTS, said: 'We welcome the fact that the issue is now clarified and look forward to [starting work] on the assignment. We see that there is a great need

for improved capacity and coverage throughout the country and it is good that we know the deal.' The government had ordered that the 700MHz (694MHz-790MHz) band be relinquished by terrestrial television broadcasters by April 2017. However, in November last year the PTS cancelled the tender, following concerns raised by the Swedish Civil Contingencies Agency (MSB) about national security and safety.

(June 9, 2017) telegeography.com



Tanzania

The government is allowing foreign investors to purchase shares in telecoms operators that are required to list on the Dar es Salaam Stock Exchange (DSE), reports media, citing Finance Minister Philip Mpango. In June last year an amendment to the Electronic and Postal Communications Act of 2010 made it a legal requirement for the country's telecoms operators to float at least 25% of their shares on the DSE. Mobile market leader Vodacom Tanzania is currently the only operator to have launched an initial

public offering (IPO), which was extended by three weeks to allow investors more time to participate. The KES476 billion (USD209 million) offering was only open to local investors, however, and the firm has yet to announce the results and has delayed its debut on the DSE. Amendments to the law will also exempt small telecoms companies with Application Services Licenses from listing and limit the IPOs to businesses with Network Facility and Network Services Licenses. (June 26, 2017) Bloomberg



Thailand

Thai regulators, after unsuccessfully trying to pressure foreign internet companies to remove allegedly illegal content, proposed imposing fines on companies which don't swiftly comply with take down requests in a bid to avoid taking cumbersome legal action. The National Broadcasting and Telecommunications Commission (NBTC) is seeking the authority to demand the removal of content the country considers illegal without waiting for a court order, Bangkok Post reported. In May, the government pressured ISPs in the country to block access to Facebook after the social media giant refused to remove 131 posts the government said were illegal. The country's Criminal Court gave Facebook an ultimatum to take down the posts or face legal action. Facebook refused to remove many of the supposedly

illicit webpages, claiming they do not violate its "community standards". The removal order was the latest in a flood of censorship requests issued by the government in recent months. Natee Sukonrat, vice chairman of the NBTC, said the government now won't attempt to block Facebook's services in Thailand, but will immediately impose financial penalties, Bangkok Post reported: "They have to play by the rules. I think they will cooperate because they make a lot of money from Thailand." He didn't disclose how the penalties would be determined. The proposed framework would also require non-domestic internet companies to have a senior manager in the country who speaks Thai so they can respond faster to requests to remove content. (June 12, 2017) mobileworldlive.com



Ukraine

The telecoms regulator, the National Commission for State Regulation of Communications & Informatization (NCCIR), has approved a draft Cabinet resolution on the extension of analogue terrestrial television broadcasting services for a further year, to July 2018. The watchdog did not pass any further comment on the postponement of the previous plan which envisaged the switchover from analogue to digital

terrestrial TV (DTT) broadcasting by 30 June 2017. Previously, the NCCIR had stated that the analogue-to-digital TV changeover must be hastened due to the need to release 'digital dividend' frequencies for 4G mobile broadband service deployment as soon as possible, but media reports that Ukraine is not ready for the transition due to incomplete DTT coverage. (June 23, 2017) BizLiga



United Kingdom

A public consultation has been launched by the Welsh Government regarding plans to bring 30Mbps-capable broadband connectivity to every property in the country. The 30-day consultation has begun after the authorities confirmed they are seeking to ensure that every property in Wales has access to 'fast reliable broadband' by 2020. The development follows on from reports in November last year that the government was planning to back a second broadband rollout project; it is already cooperating with BT infrastructure unit Openreach on the state-aid supported 'Superfast Cymru' project, under which fiber-based broadband is being made available to around 95% of Wales (or around 690,000 premises) by the end of this year. In this latest consultation – which will run until 13 July 2017 – the Welsh Government detailed the number of premises that cannot currently access superfast broadband and those that are not

expected to be reached with a commercial rollout in the next three years. Having said there are a total of 98,145 such properties, it proposes to conduct an open procurement process in respect of these. According to the report, the authorities are aiming to issue an Invitation to Tender (ITT) during September 2017, with a contract to be awarded by the end of the year. Commenting on the matter, Julie James, Welsh Minister for Skills and Science, was cited as saying: 'The consultation will help us to further refine the list of unconnected premises. The more responses we receive, the more comprehensive the list will be. If there are communities that have an interest in driving their own solutions, I want to hear from them. If there are views on how we should lot the procurement, I want to hear them. If there are views on how we should priorities or target the funding, I want to hear them.' (June 15, 2017) ISPreview



United States

US Cellular has submitted an application to the Federal Communications Commission (FCC) for a six-month special temporary authority (STA) to conduct experimental testing in the 3.5GHz band in parts of Maine and North Carolina. According to the application, as discovered by Fierce Wireless, 'the experimental testing will involve studying the radio propagation characteristics of frequencies in the proposed Citizens Broadband Radio Service (CBRS) spectrum to help determine the applicability of this spectrum to support various future wireless services'. The specific locations listed in the application are

Hendersonville and Candler in North Carolina and Charleston and Skowhegan in Maine. US Cellular seeks to test the 3550MHz-3600MHz frequencies from 26 June to 26 December 2017. US Cellular joins T-Mobile US in signposting its 3.5GHz ambitions. Last month the latter company requested FCC permission for an 'experimental license' that would cover three sites in Washington, near its Bellevue headquarters. Previously, in April 2015 the FCC voted to add another 100MHz of spectrum in the 3.5GHz band (3550MHz-3700MHz) to the 50MHz in that range already available for commercial use. (May 31, 2017) telegeography.com



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