Ooredoo: Leading a new digital era and accelerating 5G roll-out

Sheikh Mohammed Bin Abdulla Al Thani, Deputy Group Chief Executive Officer and Chief Executive Officer of Ooredoo Qatar

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Toni Eid,
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Telecom and technology vendors to produce smart cars

Technology vendors are spending years and billons in their R&D. Part of the R&D centers develops the best power consumption solution of their products and examines even how the BTS can be totally green and how it can work in very far regions where no power resources exist. This is why they develop BTS working 24/24 on solar and wind powers.

In addition, those R&D centers are exploring electricity solutions, smart solutions, chips, connectivity, among others, which are the basic foundation of autonomous, connected and electrical cars components.

The Chinese vendor Huawei plans to produce electric vehicles under its brand.

Huawei Technologies Co Ltd is in talks with state-owned Changan Automobile and Beijing-backed BluePark New Energy Technology BAIC Group for using their car factories to produce electric smart vehicles, according to two people familiar with the matter.

Huawei is aiming to produce concept models this year. The Chinese vendor will join many Asian tech companies that have made similar announcements in recent months, including Baidu Inc and Foxconn. As a result, the shares listed company such as Changan Chongqing Changan Automobile rose 5.22%, while BluePark shares jumped to the maximum daily limit of 8%.

Huawei is not a public company but for sure this step will make it soon a greater tech giant.

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Sheikh Mohammed Bin Abdulla Al Thani, Deputy Group Chief Executive Officer and Chief Executive Officer of Ooredoo Qatar

Ooredoo: Leading a new digital era and accelerating 5G roll-out

Years of advanced strategic planning and investment in network development helped the Ooredoo Group excel in its operations globally despite the challenging year 2020. The Group managed to keep the expectations of its customers high with a slew of offerings be it in the form of mobile apps, community support, or uninterrupted network connectivity whilst maintaining its position as a leading telecom operator in the region. With all these ongoings, the group was also named Qatar's Best Managed Security Service Provider (MSSP) of The Year for 2020.

Speaking to Telecom Review, Sheikh Mohammed Bin Abdulla Al Thani, Deputy Group Chief Executive Officer and Chief Executive Officer of Ooredoo Qatar elaborates on the Group's efforts to remain on top of its game even in the midst of growing competition in the sector and how innovation and forward-thinking have been its primary focus to serve its customers better.

Despite a challenging year, Ooredoo Group managed to grow its customer base by 3% to 121 million bolstered by its combined operations in Iraq, Indonesia, and Myanmar; how do you explain that?
There's no denying that the business landscape and the economy have greatly changed in 2020. It was a challenging year, yes, but we still found ways to grow our business and customer base.

In the face of a global pandemic forcing entire populations to stay home, agility was key for us to adapt to a fast-changing world, and our core promise to enrich people's digital lives became more relevant than ever.

Indeed, our digital transformation strategy and diversified customer propositions, for consumers and businesses alike, have allowed us to thrive in what is called today "the new normal". And with our teams' efforts and commitment to excellence, our networks and digital channels were ready to meet the sudden surge in demand created by the COVID-19 crisis.

Thanks to our advanced and reliable networks across our footprint, we continued to drive innovation in our digital portfolios, so that our customers had access to the latest digital services as and when they needed them.

We've supported business continuity for organisations of all sizes, offering safe communications solutions to all those working remotely. We've enabled educational establishments to provide home schooling, and ensured

families and friends stay connected while physically apart. We've launched relief packages with free call minutes, free data packs, and free SIM delivery to customers who needed them the most. This, in addition to enhancing our mobile money services and apps. And we've also boosted our home services by signing major partnerships with content providers at a time when families in confinement were seeking a wider range of entertainment options.

All this has reinforced our leadership as a true digital enabler and resulted in an improvement in customer loyalty, which was demonstrated by the increase in our customer base.

Please tell us about the Group initiatives to support the communities during the pandemic crisis.

I am proud to say Ooredoo Group reacted quickly and decisively to the challenges presented at the outset of the pandemic, swiftly putting into place measures to support our communities.

This was hardly the result of last-minute decisions when the scale of the crisis became apparent, though. Rather, it was the result of several years of strategic planning and investment in networks, in technology and in human capital, enabling us to rapidly formulate response plans that best helped our customers and communities and facilitated a smoother, easier transition to our new everyday lives under the myriad restrictions.

Investment in our networks allowed us to ensure we were able to keep up with demand and maintain network reliability. Our engineers worked day and night to ensure we offered the fastest, most reliable speeds and connectivity, boosting performance where required. We accelerated existing network enhancement programmes in order to complete work faster, and reach as many customers as possible, even in the most remote areas.

From a community perspective, our companies organised a raft of initiatives designed to help support

local governments and communities as they in turn sought to prevent the spread of COVID-19 and protect their citizens and residents. From mass awareness and education campaigns, to sanitisation drives, provision of social distancing signage and distribution of sanitisation packs, we've done everything to help limit the impact of the pandemic.

Ooredoo Qatar orchestrated a comprehensive aid effort including awareness campaigns and distribution of essentials, alongside supporting frontline workers with free data and minutes.

Several operating companies made financial donations to governments in their respective countries to support their efforts to fight COVID-19; Asiacell Iraq, Ooredoo Tunisia and Ooredoo Algeria all made sizeable contributions to government pandemic response initiatives, while others, such as Ooredoo Maldives, prioritised helping their country get back on its feet with the launch of the 'Visit Maldives Now' tourism regeneration campaign.

Ooredoo Palestine and Ooredoo Myanmar both made significant efforts to ensure young people in their countries could still access education, offering free e-learning and building a school respectively, while Indosat Ooredoo focused on practical help with the distribution of sanitisers and masks in areas

badly affected by the virus. Ooredoo Kuwait's efforts centred on enabling COVID-19 patients and their families to stay connected, distributing free SIM cards to dedicated COVID-19 facilities. Ooredoo Oman held a blood donation drive for the National Blood Centre to encourage blood donations in the wake of the pandemic.

As a result, a number of our operating companies were recognised, both locally and internationally, for their efforts to help support communities in their host nations, and Ooredoo Group was honoured with an award for the Most Valuable Corporate Response to the COVID-19 situation at the Stevie International Business Awards.

Ooredoo is the incumbent operator in Qatar. How do you manage to deal with the competition? And how has the competition pushed you to better serve your customers?
In all humility, I believe that competition teaches us valuable lessons. It drives us to be the best we can be, keeping us sharp and pushing us to continue to excel. As a customer centric company, we welcome competition, as it stimulates growth and generates substantial benefits for the community.

The way I see it is that competition drives us to foster innovations, and provide diversified products and services for our consumer and business customers.

As the leading operator in Qatar, we are proud to play our role in taking the country to new heights, in line with Qatar National Vision 2030. Qatar was the first country in the world to launch the 5G network through Ooredoo in 2018, and also recently topped the world rankings for mobile broadband speeds, proof that we are restless in investing and bringing the latest technology to our customers.

We believe any healthy market needs more than one operator in order to ensure standards remain high. Customers should always have a choice, ensuring operators consistently strive to improve their products and services and do their utmost to offer complete customer satisfaction.

That said, our main focus is on value creation for our customers, partners and stakeholders. By creating customer value, we are enhancing the whole customer journey, from the initial exploration of new ideas for innovative products and services to the buying process and after sales service.

Most importantly, we listen closely to our customers' needs and we constantly seek feedback to ensure we understand how best to serve them and bring them the products and services that they need most.

This is what drives us to succeed - and keep our leading position - in a competitive market like Qatar.

In Kuwait, Ooredoo launched its commercial 5G network. What has been the response?

We're proud to have been the first operator in Kuwait to have successfully trialled the first international 5G call in the region. I was Ooredoo Kuwait's CEO back then and had the chance to make the groundbreaking call that connected us with Ooredoo Qatar via 5G. This milestone led to the launch of our commercial 5G network in 2020, in line with our Group strategy to be a world-leading pioneer of this technology.

Our aim in Kuwait, as in other markets, is to enable everyone to access ultra-high speeds and enjoy all the

> We've supported business continuity for organisations of all sizes, offering safe communications solutions to all those working remotely

phenomenal advantages that the internet has offer.

3G and 4G relied on personal mobile devices for connectivity, and greatly helped creating a bigger market for local businesses, enabled start-ups run more efficiently, provided more opportunities, enhanced education, and kept people connected around the world.

But with 5G, Kuwait is better equipped for the future of technology. This new generation in wireless networking will see Kuwait becoming a smart nation, as it enables smart cities applications and creates an Internet of Things by integrating the country's infrastructure and buildings and improving our customers' quality of life.

So far, we've seen a very positive response, which encouraged Ooredoo Kuwait to launch an exceptional gaming product named 5G Pro Ping, enabling our customers to enjoy a superior gaming experience with exceptionally low ping rates. Also, following the launch of the company's flagship product – Shamel PRO – which is powered by 5G technology, we introduced 5G as standard with all our postpaid plans, ensuring any customer with a 5G-enabled device can access and enjoy our network via such plans.

Certainly, the introduction of the 5G network and the associated products and services has enhanced the customer experience with Ooredoo Kuwait, further strengthening our position in the market.

In Indonesia, network improvements saw Ooredoo recognised with an Opensignal Global Mobile Experience Award; what impact will this generate in the APAC region?
The Indosat Ooredoo team has achieved great work on network improvement and we were delighted to be recognised as Global Rising Stars at the 2020 OpenSignal Global Awards. This is down to smart investments and sheer hard work by our teams in Indonesia.

This kind of industry recognition is a source of pride not only for the

operator winning the recognition but also for the country and region in which it operates, as it means more customers are enjoying the benefits of superfast connectivity.

In addition to Indosat Ooredoo's win, I am proud to say that operating companies across the entire Ooredoo Group have won a wide range of awards in recent months for all aspects of their operations, from customer service to innovation, technology and digital transformation, and from a number of respected global industry experts and standard-bearers.

Ooredoo Maldives was the Company of The Year in Telecommunications Gold Winner at the 2020 Stevie International Business Awards.

Ooredoo Oman's mobile app was recognised as a Silver Winner for Best Application at the MENA Digital Awards, and Ooredoo Tunisia was the Gold Winner for Innovation in Customer Service at the Middle East Stevie Awards. The Ooredoo Group itself was also Bronze Winner of Company of The Year and received a Grand Stevie Award at the Stevie International Business Awards.

Of course, from an operator's perspective, such recognition means

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> As part of our Group strategy and focus on digital transformation, we will continue our work to make it easier for customers to find, buy and use our products and services online

customers can have confidence in the operator and their products and services, which is naturally likely to result in growth in customer base and also in take-up or upgrade of services by existing customers.

From a country and regional perspective, such recognition improves the country and region's standing amongst its global peers, which is particularly important in developing markets such as Indonesia, where the telecommunications industry is in the emerging stages.

This improvement to reputation and standing is likely to encourage stakeholders to work together to advance networks and services in the region, with the aim of creating better internet infrastructure provision to encourage growth and development in the industry.

Please tell us about Ooredoo's plans to continue investing in a multi-year growth strategy?
Our strategy to deliver sustainable returns for 2021 and beyond is based on four pillars: Core, Digital, Infrastructure and Portfolio.

We will continue to accelerate the performance of our Core business; investing in our people, our networks and our services in order to lead our markets and maximise returns on our assets.

We will continue our journey to digitalisation, making it easier for our customers to find, buy and use our products online in order to attract and retain customers at a lower cost. We will also build leading digital services and explore new areas, and extend the implementation of digitalisation across the Group to be more efficient and agile. Across our footprint, data traffic has risen throughout 2020 and more customers are moving towards digital channels, suggesting we are well on track to realise strong success from this strategy in 2021.

We will work to be more asset-light, extracting optimal value from our infrastructure by executing network sharing and other infrastructure deals.

We will also adopt a proactive portfolio strategy that will drive additional value across our footprint.

From a financial perspective, we remain focused on optimising CapEx by leveraging the Ooredoo Group's economies of scale. An example of this is our strategic 5G agreement with global leader Ericsson for the supply of 5G equipment and related implementation and integration services, which extends across all 10 Group operating companies.

We continue to work tirelessly to ensure our organisational culture is fast-moving, innovative and imaginative enough to stay ahead of the current demand curve.

And, we are committed to continuing to attract and retain talent from within our markets. I have to say, we're proud to have seen many young and emerging leaders step up and deliver during challenging times, and we plan to invest further in them, building their capacity and enhancing their skills so they can better serve our customers.

With the ever-increasing threat of cyberattacks, what has been Ooredoo's strategy in terms of cybersecurity?
Our efforts in the field of cybersecurity have garnered industry recognition from leading experts such as Fortinet. Ooredoo Group was named Qatar's Best Managed Security Service Provider (MSSP) of The Year for 2020, acknowledging important gains made by the company resulting in it becoming the largest and most effective MSSP with fully localised operations throughout Qatar.

As we progress in our journey towards digitalisation, reliant ever more on non-physical solutions and entities such as cloud, cyber-attacks are becoming increasingly sophisticated and elaborate.

To face these threats, we ensured that our strategy is progressive, innovative and flexible as we provide solutions to our business customers.

The foundation of our cyber-security strategy stands on four elements:

partnerships, flexibility, adaptability, and scalability.

We have long been committed to establishing and maintaining partnerships with best-in-class technology providers and innovators in the field of cyber-security: Atos, Carbon Black, Netscout, Akamai and Palo Alto, to name but a few. These partnerships enable us to both stay abreast of the absolute latest cutting-edge technology, and to work together to create solutions using this technology that provide innovative support to our business customers, as they strive to protect their data and businesses.

We're delighted to be able to offer flexible and adaptable solutions to suit business of all sizes, from small-office-home-office set-ups to large-scale international enterprises. Our solutions are adaptable to enable us to support businesses with a range of platforms however they choose to approach cyber-security, whether they need cloud solutions using our data centres or prefer to use their own, and whether they need turnkey, end-to-end solutions or simply want to pick and choose the support they need.

Following on from being flexible and adaptable, our solutions are also scalable. We recognise that businesses grow and evolve, and our solutions are designed to grow and evolve with them, accommodating their changing needs.

All of these elements, and the strategy they form, are designed to keep pace with the rapidly evolving digital space in which we operate. Tomorrow's requirements may well be different to today's, and it is imperative we are meticulously well-prepared to tackle cyber-security threats as and when they develop, in the best interests of our customers.

What can we look forward to from the Group in terms of new services, packages and focus areas related to digitalisation and digital products?
As part of our Group strategy and focus on digital transformation, we will continue our work to make it

easier for customers to find, buy and use our products and services online. We will make every effort to provide customers across our footprint with the most relevant digital services that meet their daily personal and business needs.

We will also look to offer new and enhanced mobile apps and features that offer great capabilities and functionalities, enabling customers to buy, manage and use our services with just a few taps. Our flagship app-managed postpaid plan in Qatar, Shahry Me, is already proving remarkably popular with customers, and – with our focus firmly on digital – is a product we can expect to see explored and expanded further.

Our mobile app portfolio now extends to cover mobile financial services, another area on which we will focus in response to the growing need for such provisions, and we will continue this extension with the roll-out of more mobile financial services products across our footprint.

We will continue the momentum in the shift to digital channels for service provision, evaluating ways in which we can further enhance options for our customers to engage with us digitally and rolling out new and improved channels where needed.

The development of Internet of Things apps and solutions will be a priority for our business customers, especially as our groundbreaking 5G networks gain traction and are further expanded.

Last but most definitely not least, we will work to include world-class premium content streaming and gaming options in our offerings, enhancing our digital entertainment portfolio and making us a market leader in this field.

With these aims in mind, we will work to onboard relevant new partnerships that will add value to our offerings and enable us to ensure we are designing and developing digital products and services that align exactly with changing customer profiles and needs. **TR**

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ICT can enable post-pandemic recovery and build resilient digital economies of the future

COVID-19 has decimated national economies and revealed the fragility of global supply chains. A natural reaction to the pandemic has been for nations to cut spending. And most have, with investment in digital infrastructure remaining flat in 2020 after years of growth. However, that's the exact opposite of what needs to happen — ICT is the key to kickstarting recovery and even surpassing pre-pandemic productivity levels.

While we have seen some acceleration in digital transformation, such cases have tended to leverage existing ICT infrastructure. As a result, not all economies have been able to transform at the same pace. Those with more developed digital infrastructure can better respond to the pandemic, set out on the road to economic recovery, and build resilience for the future.

Since 2015, Huawei's Global Connectivity Index (GCI) has tracked the progress of 79 economies, including the Middle East, in deploying digital infrastructure and capabilities. This year, a survey of organizations across the three GCI clusters — Starter, Adopter, and Frontrunner — revealed that organizations in nations with high GCI scores are 2.5 to 3.5 times less likely to reduce their ICT budgets.

Economies with higher GCI scores have greater digital readiness, thanks to mature infrastructure, which has lessened the impact of the pandemic. People and businesses in these Frontrunner economies have transitioned faster to remote work, school, business, and services due to their robust digital infrastructure like high-speed broadband and cloud. Even before COVID-19, economies that were investing in digital infrastructure enjoyed faster GDP growth during their transition to digital economies.

Full recovery from the pandemic requires two things to happen. Firstly, it requires recovery from lockdowns and border shutdowns, so that school, work, and global trade can resume via communication and collaboration tools. Secondly, it requires a return to the same level of economic activity before the pandemic hit.

Achieving these goals requires a range of digital capabilities. These include making remote learning as effective or more effective than classroom learning by using 5G-powered AR and VR. Leveraging AI and IoT can help boost workers' productivity, and applying AI and robotics can enhance healthcare services. Additionally, deploying 5G networks and edge computing can provide a more immersive experience for community interaction and entertainment.

Future-looking policymakers and industry leaders should focus on building digital capabilities in vital economic sectors, with the digital agenda placed at the heart of socioeconomic recovery plans. Our GCI report has identified five orders of productivity across five key economic sectors that are central to the global economy — task efficiency, functional efficiency, system efficiency, organizational efficiency, and ecosystem efficiency and resilience.

Policymakers and industry leaders need to consider the order of productivity that their key economic sectors operate in. We compared productivity in manufacturing and agriculture across different economies and saw that nations with higher digitalization maturity are often more productive per worker or hour worked than other economies. To accelerate the recovery of the economy to pre-pandemic levels, policymakers and leaders need to consider bringing their economic sectors up to a higher order of productivity.

They need to review the status of their digital infrastructure readiness to develop ICT strategies and plans that facilitate the digital transformation of these sectors, power economic recovery, and build future resilience. **TR**

By Li Xiangyu (SpaceLee), Vice President of Huawei Middle East

Integrated Telecom begins second phase of its 5G coverage in Saudi Arabia with 1000 additional sites

Integrated Telecom Company (ITC), a leader in telecom and ICT services, and HUAWEI, the leading global ICT infrastructure provider, started implementing the second phase of expanding the 5G infrastructure by adding 1000 new sites. This expansion will increase ITC digital connectivity and bring ultra-high-speed internet to businesses and residents.

The increased rollout of 5G technology will enable high-speed broadband through Fixed Wireless Access in areas where fiber coverage is lacking. As ITC ensures 5G becomes a reality for more people, the expansion will also support the Internet of Things, enabling smart homes, offices, and public spaces. The 5G expansion will also support the digital transformation and help businesses adapt to new technologies to keep operating and overcome all technology challenges caused by the COVID-19 pandemic.

Eng. Osama Al-Dosary, CEO of ITC, said, "We will continue expanding 5G coverage in the Kingdom, adding to the growing list of areas with access to the enhanced capabilities this technology brings. With 1000 sites providing 5G, more customers in Saudi Arabia will have access to high speed communications, that will power the future of business, government, and consumer."

"ITC acknowledges the support it receives from CITC in helping us drive Saudi Arabia's digital transformation journey," concluded Eng. Al-Dosary.

ITC is a key player in the Saudi telecom market, committed to the digital transformation of industry verticals such as oil and gas, education, healthcare, IoT, gaming, and entertainment. The expansion is part of ITC's comprehensive deployment plan of Fixed Wireless Access (FWA) services across the Kingdom, delivered in stages, with various new services and applications.

TDRA launches UAE Entrepreneurship Program for ICT sector

The Telecommunications and Digital Government Regulatory Authority launched a training program entitled "UAE Entrepreneurship Program" with participation of a number of "Be'tha" program graduates. The program aims to train and qualify young Emirati engineers to become entrepreneurs and role models in the emerging technologies scene in the UAE.

The program supports UAE's economy with Emirati entrepreneurs and startups capable of entering the marketplace and successfully starting businesses and projects. The program is in partnership with In5, UAE's leading business incubator, which has contributed (since 2013) to launching and enabling more than 350 startups, especially in the areas of technology.

The program consists of 3 phases, where phase 1 involves forming teams to explore the basic principles of the business world; market research and how to conduct it; learning how to develop products; creating and developing an economic concept. Phase 2 of the program focuses on planning, developing a roadmap, measuring performance, understanding and dealing with business tools, and how to manage the production process and product development. Phase 3 includes preparing for launching and marketing products, polling the target audience, and developing the mode of work and production based on market requirements.

Commenting on the program, H.E. Eng. Majed Al Mesmar, Chairman of ICT Fund's Board of Trustees, Telecommunications and Digital Government Regulatory Authority's Deputy Director General said, "The Telecommunications and Digital Government Regulatory Authority is keen to realize UAE's visions by preparing qualified and trained national cadres to lead the development process in ICT-related sectors, where Telecommunications and Digital Government Regulatory Authority, represented by the ICT Fund, organizes training programs that would raise the performance of Emirati youth and give them the necessary knowledge and skills to enter the job market and achieve leadership and success."
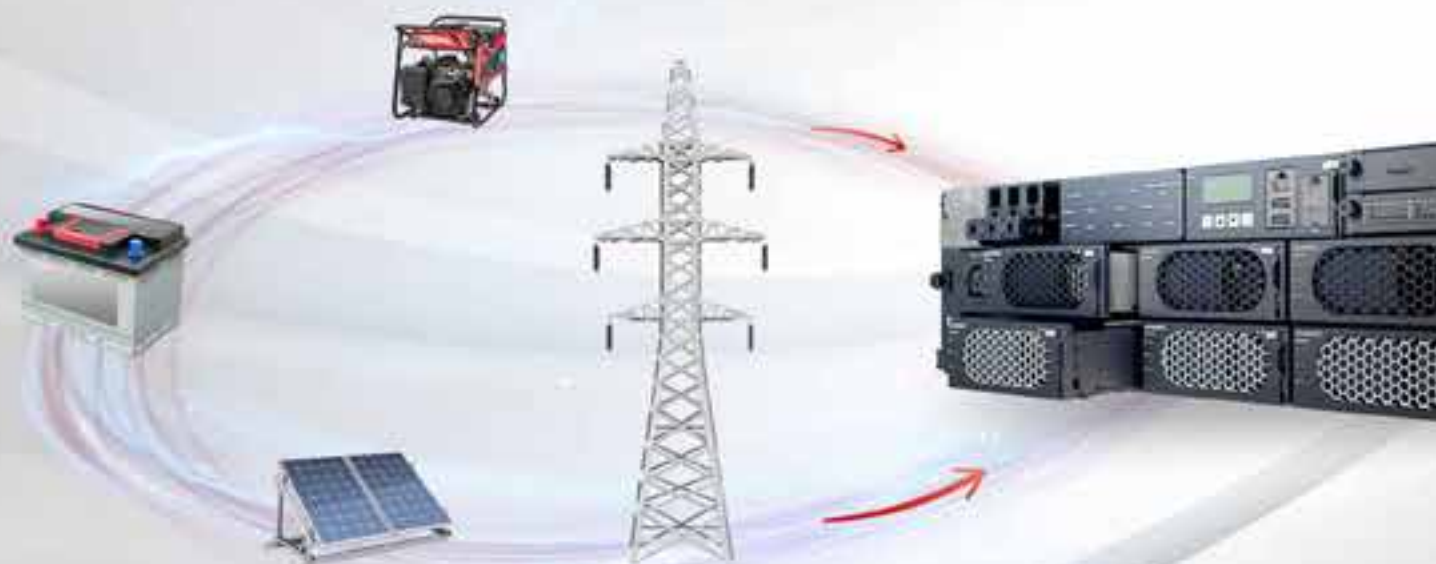
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How can an operator implement a green ITN program?

Telecom operators are increasingly aware of the challenges existing at the level of CSR, notably the ones related to their carbon footprint. This is all the more true since they are facing a sharp increase in their OpEx-energy (which may be linked to variations in energy prices, an increase in the number of customers, an increase in usage …).

On average, IT & Network (ITN) equipment and its hosting sites represent about 80% of the energy consumption and the total carbon footprint of a telecom operator (non-technical buildings and vehicles account for only 20 %.)

In this framework, more and more operators are questioning the opportunity to establish a green ITN program to meet their commitment to sustainable development and reduce their OpEX-energy. They are also aware of the impact of such an approach on their attractiveness to investors, their clients and in terms of brand value.

The key steps to set up a green ITN program

The implementation and the smooth running of such a program goes through the following key steps:

- Establish an adapted governance;
- Map energy consumption;
- Qualify and quantify the pillars of reducing this consumption;
- Ensure that supplier selection processes include energy consumption as one of the criteria for choosing equipment;

- Influence the standardization of future technologies in order to optimize their energy consumption;
- Verify the adequacy of the green CSR indicators and their numerical targets;
- Prepare for the automation of the control of energy consumption by AI.

The governance of a green ITN program is a key success factor: such a program of the energy transformation of a telecom operator's ITN concerns several of its areas of business: CSR, energy purchases, the THINK/BUILD/RUN procedures of ITN infrastructure (innovation management, standardization, spectrum management, architecture, design, engineering, capacity planning, eco-tech analysis …). Such a program must therefore be sponsored at the appropriate level of the company so that the relevant stakeholders are involved.

Mapping energy consumption by technical domain (e.g. equipment of radio access, wireline access, network core, air conditioning …) will make it possible to identify the areas that consume the most energy and have the greatest potential for gains. This mapping will be based on available

data (measurements, information in the technical and billing information systems, etc.) but may also require additional energy consumption measurements (for example, the energy consumption billed for radio sites does not make it possible to distinguish the share of consumption due to radio equipment from that due to their technical environment).

Then for each domain, it is necessary to identify the pillars of reducing consumption, as well as the associated gains (in consumption and OpEx) and their implementation costs. These pillars can be of varied types: technology choice, technical architecture, software functionalities (e.g. low-power functionalities), engineering recommendations, etc. This work, carried out with the help of the technical teams and their feedback on their implementation should enable a catalog of levers to be drawn up. This catalog should be updated each year and communicated widely throughout the organization.

We recommend that annual Energy Action Plans (EAPs) be drawn up for each entity in order to verify the achievement of the objectives set the previous year (area by area,

then consolidated) and to define the objectives for the following year.

For a proper consideration of OpEx-energy in the procedure of selecting suppliers, it is necessary to:
- Highlight through pilot experiments the energy consumptions of new equipment;
- Modify the modify the specifications to include the obligation for suppliers to specify the consumption of their equipment,
- Include in supplier contracts the obligation to monitor (measure) consumption and the implementation of penalties in the event of non-attainment of the figures indicated by the supplier,
- Implement LCA (Life Cycle Analysis) methods in its RfPs (obligations for suppliers to provide information on CO_2 emissions related to the manufacture of equipment covering the entire manufacturing chain, including contributions from subcontractors).

Future technologies, currently in the process of being standardized, will address the future challenges of energy performance for operators: for example, operators were able to express their expectations in terms of energy saving in standardization entities (NGMN, 3GPP), and influence the 5G radio interface standard (especially when it comes to ASM-Advanced Sleep Modes mechanisms).

It is important to define a quantified green ITN objective, for example a carbon footprint indicator per customer-use. This indicator must be included in the AEP and tracked over time.

Automation of the control of energy consumption by AI

The use of stored data by an operator (billing data, measurements, operating data, etc.) can be used to optimize ITN energy consumption and OpEx, but is little used today. AI can be a great means to accelerate the identification of earnings deposits, elaborate associated business case and action plan. However, the launching of such an approach requires a real effort to:
- Find "good" use cases (AI management of air conditioning in data centers, management of RAN equipment by the C-SON of suppliers…)
- Highlight the real gains associated with each use case.

What are the lessons and benefits for the operator?

First of all, the implementation of a green ITN approach allows the telecom operator to control its energy consumption, CO_2 emissions and OpEx through measurement, modeling, planning of green actions and forecasting, in the main areas of ITN.

Illustrated by indicators, the absolute increase in consumption (in correlation with the growth of the customer base and customer usage) is examined with regard to the gains in terms of carbon footprint linked to the dematerialization of usage, thus avoiding the CO_2 emissions linked to physical travel.

Some of OpEx's levers for saving energy and improving carbon footprint appear to be "quick wins" (e.g. de-commissioning inactive equipment, activating available low-power software features, complying with site temperature settings, cost assurance); but most of them require CapEx, so the savings from activating them alone do not usually provide a fast enough return on investment: It is then necessary to seize the windows of opportunity for ITN transformation (for example: SWAP or equipment renewal, deployment of a new technology) and integrate the gains made by these levers into a more global business plan. ▥

By Remy Sfez, Business Manager, Expert Transformation IT & Network, Sofrecom

Bernard Najm, SVP, mobile networks, Nokia Middle East and Africa

"Nokia delivers superior mobile networks with innovation to the MEA region"

Following his new appointment, Telecom Review spoke to Bernard Najm, SVP, mobile networks, Nokia Middle East and Africa to discuss more about different aspects of mobile networks, including 5G, security and customer experience.

You have been recently appointed as SVP, mobile networks for MEA. Congratulations! Can you explain what does your new role mean for Nokia customers?

Thank you. I am honored to have been appointed to lead Nokia's Mobile Networks (MN) business in MEA. Under the new set up, we have consolidated various functions needed for a more strong, coherent and accountable organization to bring greater value to our customers in a changing world. We are fully committed to delivering critical networks with superior quality based on continuous innovation to the MEA market and enable a more productive, sustainable and inclusive world.

My role as the head of MN in MEA is to drive all pre-sales and post-sales activities to address our customers' mobile network requirements. One of our most important tasks is to capture the needs of Communications Service Providers (CSPs) and enterprises in MEA, and make sure that they are adequately addressed by our Nokia solutions and services, in time, ahead of the competition.

How is Nokia enabling a robust 5G ecosystem through its investment in Open RAN?

As 5G continues to be rolled out, the industry has begun to explore the potential benefits of an expanded ecosystem of mobile access players in the market. CSPs, vendors and even governments are working together to define the role of open standards, and how they can help evolve 5G networks to support new services as well as enhanced efficiency. Open Radio Access Network (RAN) sits at the heart of this discussion.

We at Nokia are proud to have a unique approach to openness compared to other vendors, and have chosen to join the Open RAN Policy Coalition. The industry stakeholders including CSPs are creating a path for the adoption of Open RAN. That's why we are working with CSPs to contribute to standard definitions,

including Open RAN interfaces, and define an adoption plan.

By enabling innovations, such as artificial intelligence (AI) and machine learning (ML) applied to the RAN, Open RAN will offer many benefits. These include improved network performance; accelerated time-to-market of new services and functions; more flexible and agile networks; and CAPEX and OPEX efficiencies.

Nokia has a long history of support for open and interoperable technologies, and is also a substantial contributor to 3GPP for 3G, 4G and 5G. Nokia, along with CSPs and other stakeholders, is helping to shape policy choices that will affect how wireless networks are built, including support for research and development in open networks.

What makes a network future proof? What is Nokia offering to help its customers in this regard?

Ultra-low latency, massive connectivity and extreme capacity are the characteristics that we expect from the networks of today. To meet these requirements, 5G networks need to be highly versatile, able to change their architecture to support a vast range of services. Today´s investments must also assure that the radio network is future-proof, ready for the future demands, however and whenever they arrive. The surge of traffic we have seen in 2020 due to the Covid-19 pandemic is a good example of such un-expected demand.

Our Nokia AirScale Radio Access addresses all this and more by running all technologies in the same radio access, offering huge capacity scaling and market-leading latency and connectivity. AirScale Radio Access is industry-first commercial comprehensive 5G solution enabling operators to capitalize early on 5G. Through our AirScale Radio Access portfolio we offer a modular approach to building networks that deliver the extreme capacity, massive connectivity and ultra-low latency required for 5G services. It supports all radio access technologies including 4.9G, which provides future

service continuity with 5G networks. The AirScale portfolio also includes our commercially available AirScale Cloud RAN solution, which enables you to reap the benefits of moving to the cloud one of the key priorities going forward.

At the same it is very important for our CSP customers to deliver superior end-user experiences, seize new revenue opportunities and optimize network and operational performance and this can be achieved through our comprehensive services portfolio. Our services teams offer expertise and global reach that will enable our customers to realize the potential of the technology they deploy.

Security is an important part in mobile network deployments. What is your take on this?

Networks are essential to everybody to be able to connect with each other at work and home especially during this kind of pandemic. What's important here is to ensure that people can rely on the networks they use with adequate network security.

This requires solutions that are designed from the outset for security, which are properly managed with a robust detection and response capability and are designed with preventative capabilities to address eventual threats.

Telco security strategy needs the right balance of proactive and reactive approaches. With the dynamic evolution that operators' networks are undergoing with virtualization of network functions, cloud uptake, Internet of Things (IoT) and 5G, a holistic review of comprehensive security architecture is required.

Telcos will need to take advantage of multi-dimensional security analytics for rapid detection of threats. A new, dynamic, massively scalable, distributed security paradigm is required to ensure integrity across and through each layer of the network, ensuring that the people, process and tools are aligned with the telco's security strategy and network architecture evolution. Nokia has a

wide range of services that can help operators achieve these goals.

What will Nokia focus on in 2021 in terms of mobile networks?

As you may know MEA is a very diverse region, some countries are at the forefront of 5G adoption while others are preparing for 5G. With many live 5G networks and the aggressive rollout plans across the region, it is very important to provide competitive solutions for coverage and network slicing, and leverage the mmWave spectrum along with a high level of services to all the 5G frontrunners. At the same time, there are many countries in the region where 2G, 3G and/or LTE are the key technologies. Many of our customers there are investing now in LTE and LTE advanced technologies. As a leader in LTE network performance globally, according to independent third party researches like that of Ookla and RootMetrics, Nokia's focus is to help our customers build their networks and future proof their investments, by providing them with our comprehensive portfolio. **TR**

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> I am honored to lead Nokia's Mobile Networks business in MEA to bring greater value to telecom operators, governments and enterprise in a changing world
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> "

After the disruption wrought by the Covid pandemic, stimulating economic growth is now an imperative. And technology will drive this growth. Obtaining optimum performance from digital devices means putting reliable mobile networks in place at a vigorous pace.

CommScope – How to design a network that meets the Middle East's vision for the future

LTE expansion and 5G
Mobile networks are expanding at an impressive rate across the Middle East and 2021 promises to be a golden year for building the basis of a truly interconnected economy. Networks come in all shapes and sizes but they must be designed using the right equipment. Consumers rightly expect this equipment to aesthetically blend into their environment. Form and function matter more than ever.

Close cooperation between operators and suppliers starts with identifying equipment that meets these needs. Examples of such successful collaborations between both these parties are increasing each month.

Streamlining to prepare for 5G
With a national mobile penetration rate of about 125 percent, Morocco is among the most developed mobile markets in North Africa. The vast majority of the country's internet connections (93.2 percent) are over cellular connections. Currently, the fastest growing wireless provider in Morocco is inwi, headquartered in Casablanca. Its nationwide mobile/fixed network serves more than 12.5 million users with a mix of 2G/3G/4G

and fixed wireless access (FWA) services.

Most recently, inwi became the country's first to deploy an innovative 28-port, all-in-one antenna from CommScope, streamlining its network and paving the way for 5G. Large spectrum bands availability benefit inwi in capacity and traffic management but not without challenges; network complexity design increase, and interference.

The network operator needed a customized antenna solution; one that could support a wide range of spectrum bands, and was fast and easy to install and connect. When they began preparing their network for 5G, inwi called on CommScope and their innovative all-in-one antenna.

With a set of passive antennas network, operators can opt for hardware that optimises power consumption right across their network. This tackles questions of sustainability in 5G implementations head-on. It pays to recognise that an area where traffic will be low can use passive antennas instead of larger ones that need more power.

At CommScope, we deal with a whole gamut of technologies for networks that in turn could play a role in transforming economies. Looking ahead at the communications needs of tomorrow requires an understanding that not all end-users are the same, and that circumstances vary.

CommScope has no doubts that connectivity has moved to the top of the agenda when it comes to enabling economies to thrive. Countries across the region see 5G as a springboard for economic activity. But in an environmentally conscious world the network underpinning 5G has to be unobtrusive and frugal in its energy needs. Our technology is integrated into a range of slim antennas that are packing more functions into a neat footprint. This suits contemporary

thinking on urban design and respects the public's view.

Fibre plays a critical role in meeting growing network demands

Service providers have seen their home networks put under unprecedented strain during the COVID-19 crisis. Home-working, home-schooling and generally more home-based living have resulted in a surge in demand for bandwidth.

Squeezing more out of less is important for the whole telecoms industry. We have found ways to push fibre deeper into the network while managing cable connections more efficiently. Therefore, less digging, and less cost for the network operator who can make the most of the connections that already exist within a finite spectrum.

Connecting Indoors

While fibre quite rightly took centre stage for operators while we've all been at home, attention will now turn back towards indoor wireless connectivity. After all, we spend most of our time using wireless devices while indoors.

From stadiums and airports to hospitals and busy offices, delivering mobile connectivity indoors can represent a significant challenge. This is due to the volume of people – and therefore mobile traffic –in the building, or the architecture of the building itself. Energy-efficient, glass-heavy buildings block higher frequency spectrum bands relied on for 4G and 5G connectivity, for example.

CommScope's ONECELL, part of our small cells portfolio, enables mobile network operators to meet the growing demand for reliable LTE and 5G services indoors. Consumers have been dazed by years of 5G hype. Finally, they will see 5G delivering in their lives in the next couple of years and without obtrusive infrastructure or patchy access.

Proactive network operators will have 5G in place as they strive

for ubiquitous lightning-fast communications in the near future. This will be the year new design approaches are taken to accelerate the economic viability. The investment to make that happen is already in place.

Mobile connectivity is critical for economic renewal. And to quote Mats Granryd from the GSMA, "our sector will form the backbone of the future global economy." ▥

By Femi Oshiga, vice president of service providers for Middle East and Africa, CommScope

At CommScope, we deal with a whole gamut of technologies for networks that in turn could play a role in transforming economies

Ali Amer, managing director, service provider sales, Cisco Middle East and Africa

'Digital connectivity will determine access to economic and social opportunity'

In an increasingly hyper-connected world, the need to navigate through this transformational change with minimal friction seems to be everyone's endeavour. Cisco has been at the forefront providing the latest in technology know-how and resources to give its customers the tools to thrive in the digital age. In an exclusive interview with Telecom Review, Ali Amer, managing director, service provider sales, Cisco Middle East and Africa, talks about Cisco's role in the digital transformation globally and regionally.

Currently, only 35% of developing countries have access to the internet, compared to 80% in developed economies, what has been Cisco's strategy in facilitating global connectivity?

Cisco's Annual Internet Report predicts that by 2023, machine-to-machine communications will make up 50 percent, or about 14.7 billion of all networked connections. This mass connectivity, along with other technological advancements such as 5G and artificial intelligence (AI), promises opportunities beyond what we can currently imagine.

However, being involved in the business of connecting and protecting, we also know that each country is at its stage of digital readiness, and that to reap the benefits of the Internet, we need to see more equal access to resources and technological infrastructure. This is why a one-size-fits-all approach to Internet expansion will not work in every market.

We build upon our years of experience in the field and work alongside local service providers on-ground to understand national priorities, as well as needs at a business and basic human level. Our strategy is focused on tailoring our products and services to meet the individual requirements of a country and to consider how we can best positively impact a wider audience.

Above all, we believe that technology plays a pivotal role in powering an inclusive future – especially as digital connectivity determines access to economic and social opportunity. This connectivity is critical to creating a society and economy in which all citizens can participate and thrive. Our mission is to help governments, businesses and individuals collectively contribute towards creating connections, forging new opportunities and opening avenues to include all.

What is Cisco doing in terms of new market penetration in the region?

Across the Middle East and Africa,

Cisco is currently empowering 74 nations to leverage the power of technology and transform their digital strategies across sectors including education, healthcare and government services.

We support digitization agendas through investment and collaboration with national leadership and academia, as part of the Cisco Country Digital Accelerate (CDA) program. The CDA program is currently running in countries such as the UAE, Saudi Arabia, Egypt and South Africa. As can be imagined, ensuring the right networking infrastructure is in place is a key priority for all nations – especially in light of the past year, which highlighted just how important it is to invest in digital.

To penetrate any of the markets in which we operate, first and foremost, we have to communicate value to local stakeholders. The marketplace is full of choice, so ultimately it comes down to experience and value add. We are in a unique position where Cisco solutions have security built into their

very DNA – rather than being a mere afterthought. So securely connecting businesses and people forms a large part of our value proposition.

Local partnerships are extremely important to us. To ensure we reach the right audiences, we work with organizations on-ground within the communities in which we operate. This allows us to tap into government insights, service provider goals and what end-users demand at a granular level – to truly provide an offering that benefits all parties.

Please tell us about the innovative digital solutions that Cisco is offering to its consumers and enterprises.

On the traditional networking front, Cisco's '5G Now' portfolio for service providers includes multi-cloud, IP core, 5G packet core and service edge, access, client services, security, and professional services, offering a cloud-to-client approach for 5G networking.

Our approach involves offering an open, hyper-programmable architecture that slims down a customer's multivendor, multidomain network into a more agile and unified system – completely eradicating usual complexities.

We have used our breadth of understanding across multi-cloud, IP routing, 5G core, service edge, access networks, IoT, and security to create 5G services and networking which offer real value to our customers. By delivering traffic engineering, bandwidth management and greater network control can be achieved – these are the objectives we empower our customers to achieve via such solutions.

Among a host of other solutions that promote connectivity, one of the most prominent and widely used is the Webex collaboration platform. Webex has a rich history of helping employees and individuals innovate and remain productive wherever they are. Since the pandemic, Webex has not only continued to help businesses thrive, it has also been an integral collaboration platform

for governments to continue to lead remotely, doctors to meet with patients safely, and educators to teach students at a distance. The future of work and smart workplaces will involve hybrid working models. We have a clear vision of how technology can help customers realize the future today and create a more inclusive world for all.

Our reimagined Webex platform provides a single secure place for users to not only connect, but also be more productive. Among our new features, we have noise cancellation and speech enhancement. Webex automatically detects and suppresses common noises such as loud typing and the rustling of papers to keep users deep in their train of thought. We have also removed the need for extensive note-taking. Our transcripts are searchable, so team members who miss a meeting can quickly catch up.

We will soon be unveiling in-meeting gestures, where AI translates motions such as a thumbs up into an on-screen alert for all to see. Speakers will also be empowered to talk in over 10 languages (including Arabic), with real-time transcriptions provided for all attendees on the call.

What has been Cisco's zero trust methodology when it comes to cybersecurity?
At Cisco, we believe that zero trust is a vital approach to security. Traditional security approaches assume that anything inside the corporate network can be trusted. The reality is that this assumption no longer holds, thanks to mobility, BYOD (bring your own device), IoT, cloud adoption, increased collaboration, and a focus on business resiliency.

We can no longer assume that internal entities are trustworthy, that they can be directly managed to reduce security risk, or that checking them one time only is enough. The zero-trust model of security prompts you to question your assumptions of trust at every access attempt.

Our Cisco Zero Trust platform offers a comprehensive solution to secure

all access across applications and environments, from any user, device, and location. This complete zero trust security model allows users to mitigate, detect, and respond to risks across your environment.

Security teams can make it harder for attackers to collect user credentials and network access and to move laterally, and users can get a consistent and more productive security experience – regardless of where they are located, what endpoints they are using, or whether their applications are on-premises or in the cloud.

What are the challenges that you foresee for the telecom industry in the future?
Countries across the Middle East and Africa (particularly those in the Gulf region), have performed well regarding facilitating the substantial shift to digital infrastructures over the past year. Technology and local service providers have worked collectively, in close collaboration with government entities to ensure that networks are designed to always keep users connected and also be one step ahead of cyberthreats.

Looking ahead, Cisco's Annual Internet Report predicts that by 2023, MEA will have 611 million Internet users, up from 381 million (24 percent of regional population) in 2018. Alongside this, the region will have 2.6 billion networked devices/connections, up from 1.7 billion in 2018. As expectations for faster and more secure connectivity only continue to grow, nations must further accelerate investments in areas such as 5G, Wi-Fi 6 and cloud.

We are seeing decision-makers across all nations regionally seeking to strike a careful balance between managing data concerns, while promoting an open arena for communication and a culture of innovation. To overcome such challenges, we need to see continued momentum and cooperation between regulators, technological facilitators and service providers to ensure secure and scalable digitization. **TR**

The rise of IoT in smart cities

The role of the internet of things (IoT) technology in the post COVID-19 pandemic world cannot be overlooked. The use of the technology is already enabling innovative strategies such as contact tracking system, remote monitoring of COVID-19 symptoms and remote medical consultations among others, to fight the challenges posed by the virus in cities across the world today.

Many IoT innovations, especially in the health and community development sector have tapped into initiatives such as Coronavirus Innovation Map launched by StartupBlink, a global interactive map for startups, in collaboration with Health Innovation Exchange – a UNAIDS initiative.

The map is a directory of hundreds of innovations and solutions globally that could support and strengthen the response to COVID-19, helping people to adapt to life during the pandemic and to connect innovators so they can collaborate on solutions.

Speaking of innovations, Zyter, a leading digital health and IoT-enablement platform, recently introduced Zyter ThermalAlert solution that automatically monitors temperatures of spectators entering sports venues. Combined with the high bandwidth, low latency and massive computing power of 5G ultra wideband and 5G edge network, the process allows for faster and safer entry whilst reducing congestion in queues.

With all these developments taking place, it would not be wrong to presume that IoT is being widely embraced in building efficient and safer cities with end number of connected devices growing rapidly.

Research firm Markets and Markets report that IoT in the smart cities market is projected to grow from $79.5 billion to $219.6 billion, at a CAGR of 22.5% from 2018 to 2023.

The use of IoT in smart buildings will see the growth in use cases of the automation system, smart door locks, smart heating systems, security camera, and lighting etc.

Smart-city programmes such as C40 Cities that are taking bold climate-friendly action and leading the way towards a healthier and more sustainable future can generate positive results with connectivity as a key enabler. For instance cities like London, Berlin and Madrid have been able to reduce greenhouse gas (GHG) emissions of motor vehicles by 30% each from their peak rates.

In the wake of the pandemic, city dwellers and enterprises alike have

realized the need to remain resilient and optimistic to ensure continuity in times of disaster and to bounce back to normalcy. For such a reality to materialize, quality infrastructure, interconnected communities and good governance lie at the heart of every city to cope in the most challenging times.

Global consulting and research firm Analysys Mason's analysis in three industries namely energy, healthcare and manufacturing which are known to have high GHG emissions shows that 5G can have a significant effect, when combined with other technologies such as cloud, AI and the Internet of Things (IoT) with additional adoption of renewable energy sources.

IoT enablers

By utilizing multi-access edge computing (MEC) network solution to provide services and computing functions on edge nodes that allow application services and content closer to users and implement network collaboration, IoT can provide users with a reliable and ultimate service experience.

Furthermore, cellular IoT technology allows the connection of physical objects to the Internet using existing mobile networks used by smartphones, eliminating the need to invest and develop a separate dedicated network infrastructure just for IoT devices.

Greater bandwidth, lower latency and increased support for large volumes of devices per cell will be made possible with the application of 5G networks, such as 5G new radio (NR) standard, triggering ultra-reliable low latency communications (URLLC) that support increasingly critical applications.

Mobile network providers, as well as device, chipset, module and network infrastructure vendors, can harness the benefits of cellular IoT as it offers better performance than other low power wide area (LPWA) network technologies in terms of global coverage, quality of service (QOS), scalability, security, and the flexibility to meet requirements for a plethora of use cases.

Regulators can lower barriers to 5G deployment by making spectrum and city infrastructure available in a timely and affordable way.

MNOs can work with all stakeholders to set common objectives and roadmaps for 5G-enabled efficiency and ensure smooth 5G planning and deployment.

The issue of security and diversity

Malicious players are always on a roll to take advantage of unsecured IoT devices and operational technology assets through cyberattacks. Healthcare organizations, as well as manufactures, are already under cyberattack threats in recent times.

Security is a broad concept when it comes to IoT deployment and needs to be adopted on a use case basis. However, general security principles such as PKI, public-key cryptography, encryption, mutual authentication, and certificates are mandatory in IoT management.

Service providers may look at automated traffic baselining, artificial intelligence (AI), and machine learning (ML) techniques to help security teams recognize and deal with zero-day attacks with faster response time by identifying anomalous behavior compared with legacy norms.

With the exponential growth in connected devices, every enterprise will use tens of thousands of devices that they have to manage from their central operations. These devices come in many different forms, purposes, utility. Management techniques that can distribute workloads efficiently and accurately at a massive scale without requiring individual administrators for assigning workloads to individual devices are a must.

Business gaps

All these may sound like complexities but they provide an opportunity for vendors to introduce management controls that can handle that diversity and dynamism, protect data and create an ecosystem that is safe, secure and sustainable.

For new business models in sectors such as telehealth, auto, finance and retail, connectivity must be flexible and agile to meet the network performance required for a wide variety of evolving IoT use cases, applications, and device types.

According to IoT Analytics, the global IoT market reached $151 billion in 2018 and is forecasted to grow to $1,567B by 2025.

The IoT advantage in terms of improved efficiency, sustainability and safety for industry and society will only grow. Analysts predict that communications service provider IoT revenue globally will increase at a combined annual growth rate (CAGR) of 24.9 percent through 2023 with a variety of applications and solutions designed for individuals, businesses and industries.

High-profile attacks, combined with uncertainty about security best practices and their associated costs are keeping many businesses from adopting the technology. Are ICT companies listening? **TR**

> IoT in the smart cities market is projected to grow from $79.5 billion to $219.6 billion, at a CAGR of 22.5% from 2018 to 2023

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Can SD-WAN and MPLS networks co-exist? Do they need to?

By now, most of us are used to the 'work from home' concept, thanks to the COVID19 pandemic and the work –life challenges that it has thrown at us. Given the apparent layer of protection working remotely provides, organizations are left with no choice but to ask a large number of staff to work from various locations other than their offices. As a result, the network issues of capacity and load access have begun to surface prominently.

Add to this the need for data protection across all industries with networks connected to many locations and devices and you have a perfect recipe for potential network outages and operational malfunction.

A recent report by Kaspersky, a global cybersecurity firm says, "People are more and more willing to choose services that have at least a promise of privacy, and even pay for them."

With the increase in data volumes and rapid adoption of cloud-first strategies across industries, companies are looking for network and bandwidth that can support remote work consistently. Innovative network infrastructure that complements the changing demands of time can help businesses cut costs of technology upgrades to focus on core tasks at hand.

Today, service providers have to take into consideration network control features that support video streaming, conference call hosting, checking emails or accessing critical business applications no matter where they are hosted.

Next-generation solutions like software-defined wide area network (SD WAN) is being seen as an alternative to multi-protocol label switching (MPLS) supported networks.

So what are the main differences between the two network methodologies?
SD-WAN is more cost effective than MPLS
MPLS uses packet-forwarding technology and labels to make data forwarding decisions. What this essentially means is that MPLS can offer superior service in avoiding packet (units of data) loss and keeping an organization's mission critical traffic flowing. This reliability enhances the quality of real-time protocols, such as Voice over IP (VoIP). MPLS providers can also assign a higher priority to certain network traffic. Traditionally, organizations process data back and forth from their remote branches to the central data center through WAN model that relied on individual MPLS connections, including access to cloud services or the internet. However, this process consumes lot of expensive bandwidth adding up to the company bills.

In contrast, SD-WAN virtualizes the network functions that run on the network infrastructure as software on commodity hardware. It can reduces costs by providing optimized, multi-point connectivity using distributed, private data traffic exchange and control points to give users secure, local access to the services they need whilst securing direct access to cloud and internet resources.

SD-WAN provides better protection than MPLS
MPLS network lacks built-in data protection capabilities and if implemented incorrectly, it can expose the network to vulnerabilities. MPLS does not provide any sort of analysis of the data that it delivers. Even when passing an MPLS connection, traffic need to be checked for malware or other exploits, which requires firewall deployment.

By virtue of SD-WAN security virtualization functionality, an organization can benefit from end-to-end encryption across the entire network, including the internet. All devices and endpoints are completely authenticated via a scalable key-exchange functionality and software-defined security.

When is MPLS better than SD-WAN alone?
In some scenarios, MPLS could be a better choice than SD-WAN alone. For instance, MPLS provides a clean and secure connection that is desirable for certain types of data, applications, and transactions that require high integrity and privacy. When security and reliability are more important than cost differences, SD-WAN can run over an MPLS connection to provide more protection and functionality than an MPLS solution alone. SD-WAN provides a greater amount of flexibility, more granular traffic control, integrated security, and the ability to leverage multiple connection strategies—MPLS, public internet, IPSec, SSL, etc.—using the same SD-WAN deployment.

A recent report by Persistence Market Research revealed that the global SD-WAN market is anticipated to grow rapidly – reaching a valuation of $53 billion globally by the end of 2030.

Indeed, SD-WAN services offer service providers new opportunities to enhance the consumer experience but on the other hand many companies have already invested heavily into developing their MPLS network infrastructure. Businesses today need a diverse set of digital solutions to ensure they are successful in digitally transforming themselves. ICT industry partners need to working closely with customers to understand the best communications infrastructure needed to meet end user demand in a time when markets are shifting like never before.

Building a system that is ready to dynamically adapt to changes in demand by navigating the complexities of legacy systems on a global scale with market-proven operational experience is what the ICT players need to focus on.

Managed service providers, system integrators and other channel players have to leverage the benefits of 5G technology by paying close attention to the unique security risks SD-WAN introduces but the good news is that more than anything, MPLS remains relevant because it compliments more than it interferes with SD-WAN technology.

Solution providers could do well to look at the Network-to-Network-Interfaces (NNI) option of a hybrid solution of private MPLS line and flexible SD-WAN solution to come up with an efficient, secure and fully automated end-to-end network orchestration to safeguard internet-connected corporate assets and data from remote and insider threats. Additionally, it could also provide the basis for a seamless migration from old MPLS networks to new hybrid SD-WAN services. **TR**

Etisalat and stc retain titles of MEA's strongest and most valuable telecoms brands

Telecom giants Etisalat and stc remain the frontrunners across the MEA region, claiming the title of the MEA's strongest and most valuable telecoms brands, respectively, as per Brand Finance Telecoms 150 2021 report.

Saudi-based stc is the region's most valuable brand with its brand value up an impressive 14% to US$9.2 billion and simultaneously jumping 5 positions to 13th and becoming a AAA- brand. stc has recently doubled the capacity of its network to enhance its operations to serve its customer service.

stc is playing a crucial part in KSA's Vision 2030 – a strategic framework to diversity the economy away from oil – through establishing a digital hub for the whole region to accommodate future growth in the IT sector.

Meanwhile, UAE-based Etisalat has been crowned the MEA's strongest telecoms brand, with a Brand Strength Index (BSI) score of 87.4 out of 100 and a corresponding AAA brand strength rating – the only brand in the region to achieve this rating. This has been achieved due to its strategy over the last few years and its recent achievement of becoming the fastest network on the planet. The brand was in a position to respond immediately to the 'new normal' of the pandemic, providing solutions and flexibility in a way that connected emotionally with consumers. Etisalat Group, the most valuable telecoms portfolio in the region which has recently broken the US$11 billion mark, is turning its sights on transforming into a truly global player.

Just few days ago, Etisalat posted a consolidated net profit of Dhs 9.0 billion, a 3.8% increase year over year attributed to strong growth in the international operations that outweighed the decline in the UAE operations.

Every year, Brand Finance releases the ranking of the world's top brand guardians – the Brand Guardianship Index – which includes the top 100 CEOs globally. Brand Finance researched and evaluated the brand guardianship score of over 200 CEOs this year.

stc's Nasser Sulaiman Al Nasser topped the list of Brand Guardians from the telecoms sector this year. Al-Nasser announced his resignation in November of 2020, having presided over a successful rebrand and a period of growth for the stc brand.

The two most recently appointed Brand Guardians in the Telecom industry were Etisalat's Hatem Dowidar, ranking 3rd and Telia's Allison Kirkby, ranking 6th.

Zain KSA posts net profit of SR260 million for FY 2020

The Saudi Mobile Telecommunication Co. (Zain KSA) recorded a net profit of SR260 million ($70 million) for the year 2020, a 46 percent decrease in earnings as compared to a previous net profit of SR485 million, the company stated on the Saudi stock exchange (Tadawul).

Revenues dropped by 5.6 percent due to the impact of the pandemic, which led to minimal numbers of Umrah visitors, limiting Hajj to local pilgrims. The reduction of the mobile termination rate in the second half of 2020 also aggravated the situation.

The cost of revenue increased by 2.2 percent, which resulted in a decrease of gross profit by a cumulative impact of 8.8 percent.

Zain KSA absorbed the negative impact partially by decreasing Opex by SR136 million. Depreciation and amortization increased by SR128 million as a result of capex investment.

Etisalat Group registers highest annual profits in 5 years

Etisalat Group announced its preliminary financial results for the

year 2020, recording a 4% year-on-year growth in profits to reach 9 billion dirhams ($ 2.45 billion), benefiting from reduced operating expenses after the fourth quarter of 2019 saw allocations of 1.2 billion dirhams due to a decrease in value of the subsidiary company in Pakistan. These results are among the highest annual profits recorded by the group since 2016.

Revenues stabilized at 51.7 billion dirhams, down by about 1% on an annual basis and mainly affected by the repercussions of the coronavirus, which led to the travel ban and the decline in commercial activities in most countries where the company

is present. Although Etisalat has not announced details of its revenues, it is expected that this will result in a decline in prepaid line revenues, which consumed the achieved growth in data revenues.

On the same line, operating profit improved by 10% to reach 13 billion dirhams, in parallel with the company's success in reducing its operating expenses by 1.7 billion dirhams to reach 38.7 billion. Accordingly, the operating profit margin improved by 2.56 percentage points to 25.17%, which is considered one of the best margins achieved by the group historically.

Telecom giant du reports Dh 1.44 billion net profit for FY 2020

Emirates Integrated Telecommunications Company PJSC ("EITC") popularly known by its brand name 'du' reported a total Revenue of AED 11.08 billion and a Net Income of AED 1.44 billion for the year ended 31 December 2020. The results reaffirm the company's profitability and the resilience of its model in a difficult operating environment caused by the COVID-19 pandemic. EITC's Capital Expenditure increased by 24.1% year-over-year to AED 1.87 billion, representing a capital intensity of 16.9%, its highest level over the last

five years, as the company's strong balance sheet enabled it to maintain its ambitious capital deployment plans for 2020.

In 2020, capital expenditure(CAPEX) increased by 24.1% to reach AED 1.87 billion, representing the company's highest level of capital intensity over the last five years, which was primarily used to enhance the network and continue 5G roll out.

On the basis of these results, the Board recommended to the shareholders the approval of a dividend distribution, for the year 2020, of 28 fils per share, out of which 13 fils per share were paid in August 2020 as an interim dividend.

The company board has approved foreign ownership of up to 49% of the company's share capital. Q4 2020 Mobile Revenues were almost stable at AED 1.32 billion, compared to AED 1.33 billion in Q3 2020, impacted by the COVID-19 pandemic and changes in population and mobility patterns.

In Q4 2020, EITC reported 1.0% increase (when compared to Q3 2020) in its mobile subscriber base, to 6.66 million subscribers and a 3.4% year-over-year improvement in ARPU reflecting a better postpaid and prepaid subscriber mix.

Q4 2020 Fixed Revenues were at AED 645 million, up by 1.4% from Q3 2020. 2020 fixed revenues increased to AED 2.57 billion, up by 3.0% when compared to the previous year.

Commenting on the results, Mohamed Al Hussaini, Chairman of EITC said: "2020 has been a challenging year with the unprecedented pandemic impacting all businesses locally and globally. Our business model proved solid and resilient compared to many other industries."

Meanwhile commenting on the results, Fahad Al Hassawi, Acting CEO of EITC said: "Our business saw a positive momentum towards a gradual return to normality in the second half of 2020, as economic activity and trade and tourism resumed. We reported two consecutive quarters of positive revenue growth in the third and fourth quarter of 2020, respectively, and reported a healthy net income of AED 1.44 billion for the full year 2020. Our fixed revenues grew by 3.0% year-over-year to AED 2.57 billion in 2020, supported by a 7.4% increase in our fixed subscriber base during the same time period, demonstrating our competitive strength and ability to gain market share during this challenging period."

Omantel becomes first to launch 5G sevices for mobiles in the Sultanate

In a first by any telecom service provider in the Sultanate, Omantel has announced the launch of 5G services for mobile devices that aims to give mobile customers further value and speed for their money and harnessing the potential of path-breaking communications technology.

Omantel had rolled out its 5G services for fixed Home Broadband in December 2019 and now, its mobile customers too can avail services through their 5G enabled mobile devices or 5G router with more speed and efficiency.

Oman's telecom services market has witnessed significant changes over the past years, fuelled by a growth in demand, the thrust towards digital

transformation, and evolving user behaviour.

The roadmap for launching 5G for mobile had been in place even before late 2019 when 5G services were introduced for Home Broadband in certain areas. Backed by this solid 5G infrastructure and buoyed by the great customer response, Omantel has now brought 5G for mobile to revolutionise Oman's ICT sector as the technology is an enabler for speed, efficiency, and innovation.

The company has been working continuously to make this technology available to as many members of the population as possible by expanding 5G service coverage.

As 5G reaches more and more customers – be it individuals or enterprises - Oman will be further propelled towards its digital

transformation goals that have been enabled by smart solutions and innovative services delivered faster, thanks to the power of 5G and Omantel's proactive and futuristic approach.

Omantel has continued to remain a dominant player in Oman's ICT sector, staying ahead of the game through foresight and investments in the necessary infrastructure. The launch is the latest in a series of achievements by Omantel in bringing the future technologies and further solidifying Oman's image as the region's ICT gateway. It is worth noting that Omantel's mobile network has been recently rated as the fastest in Oman by Ookla, an online platform dedicated to measuring the performance of broadband networks around the world. This achievement is apart from the acknowledged excellence Omantel has shown through innovative technologies and smart solutions.

Telecom Egypt announces highest FY 2020 revenue and growth in the Egyptian telecom market

Telecom Egypt highlighted its 2020 full-year results with net profit recording EGP 4.9bn, marking a growth of 10% YoY.

Consolidated revenue grew 24% YoY, landing at EGP 31.9bn. The growth was mainly driven by the 39% YoY increase in data revenues, constituting 53% of top line growth, and the doubling of cable projects revenue (+ EGP 1.4bn YoY.)

Customer base grew on all fronts with fixed voice and broadband growing 14% and 20% YoY, respectively, and mobile customers growing 43% YoY, reaching 7.3mn.

EBITDA came in at EGP 11.1bn with a strong margin of 35%, exceeding the FY guidance. Normalized EBITDA, excluding the ERP & one off costs, grew 60% YoY.

The BoD proposed a dividend of EGP 0.5 per share for 2020, 2x 2019, representing a dividend yield of 4.4%.

Adel Hamed, managing director and chief oxecutive Officer, commented: "This year's results reflect Telecom Egypt's fortitude and resilience throughout 2020 and its outstanding ability to accommodate the market's sudden shift towards digitization during the Covid-19 outbreak."

Hamed added, "I am very pleased that our heavy network investments have enabled us to cope with the unanticipated growth in data demand and subscriptions, and led Egypt's average internet speeds to more than

double, reaching 35 Mbps by the end of the year. This was reflected in our exceptional growth in data revenue (+39%) and subscribers. I would also like to highlight that our diverse business portfolio continues to secure our growth. We see strong momentum in the submarine cable segment with 2Africa recognized in 2020 as the first cable to circle the African continent. Our domestic wholesale business also continues to thrive on the growing demand for data services.

Going forward, we will capitalize on the additional spectrum that we will soon receive to secure future growth and provide our customers with the best value data products in the market. We also plan to offer a wide range of cutting-edge IT solutions to our local and international customers through our data centres, including Egypt's largest facility that will be commissioned during 2021."

MTN agrees to sell its shareholder stake in BICS for R1,8 billion

South African multinational mobile telecommunications company, MTN announced that the Group has concluded an agreement to sell, and thereby fully exit, its 20% shareholding in Belgacom International Carrier Services SA (BICS) to Proximus NV/ SA.

However, the timing of closing is dependent on customary regulatory approvals. Once all the conditions precedent have been fulfilled, MTN will receive proceeds of approximately €100 million (R1,8 billion) in cash,

which the Group intends to use to pay down US dollar debt and for general corporate purposes.

The transaction consideration compared to MTN's market capitalisation results in a percentage below the categorisation threshold as prescribed in the Listings Requirements of the JSE Limited.

BICS was classified as a non-current asset held for sale and this transaction has resulted in a remeasurement of its carrying value resulting in a reduction

of R397 million for the year ended 31 December 2020, according to the statement.

MTN will record a profit on disposal amounting to approximately R1,2 billion during the first half of 2021, mainly due to the release of the foreign currency translation reserve. This results in a net impact of R812 million over the two periods.

The sale represents further progress in MTN's stated asset realisation programme (ARP), which aims to reduce debt, simplify its portfolio, reduce risk, improve returns and unlock value.

BICS' network connects IoT devices with 2G, 3G, and 4G to more than 700 global mobile operators. In addition, it has developed one of the largest NB-IoT/LTE-M networks, with coverage in 30 countries and through its eSIM solution, manufacturers can embed connectivity and switch networks on-demand.

Mobily beats expectations, reports net profit of SAR 783 million for FY 2020

Etihad Etisalat (Mobily) achieved a net profit of SAR 783 million for the year ended 31 December 2020, compared to a net profit of SAR 31 million in 2019.

The company's revenues in 2020 amounted to SAR 14,046 million versus SAR 13,450 million in 2019, a growth of 4.4%. This is mainly attributed to the growth of data revenues, the growth of Business Unit and wholesale revenues, in addition to the growth and improvement of subscriber base.

The increase in revenues in 2020, resulted a gross profit of SAR 8,152 million versus SAR 7,800 million in 2019, a growth of 4.5%.

Mobily achieved the highest EBITDA in the last 7 years reaching SAR 5,350 million in 2020 compared to SAR 4,947 million in 2019, or an increase of 8.2%. The EBITDA increase is attributed to the company's efficiency in managing its operations and the growth of revenues. EBITDA margin increased to 38.1% for 2020 compared to 36.8% for 2019.

Reflecting the improvement in EBITDA, 2020 operational profit amounted to SAR 1,367 million compared to an operational profit of SAR 967 million in 2019, an increase of 41.3%.

Financial charges for 2020 dropped to reach SAR 561 million compared to

SAR 929 million in 2019 representing a decrease of 39.6% reflecting the company's efforts to reduce the funding costs by refinancing big portion of its debts at the end of 2019 and the decrease in the interest rate.

Zakat expenses for 2020 amounted to SAR 43 million compared to Zakat expense of SAR 49 million in 2019.

Mobily net debt amounted to SAR 10,602 million at the end of 2020 versus SAR 10,626 million at the end of 2019. Capex in 2020 amounted to SAR 2,792 million compared to SAR 2,760 million in 2019.

Mobily improved its 2020 operational cash flow (EBITDA-CAPEX) to reach SAR 2,558 million compared to SAR 2,187 million in 2019, representing an increase of 17%.

Infoblox SP Virtual Summit by Telecom Review: Designing next generation service providers network

The Infoblox SP Virtual Summit by Telecom Review was held on February 17 and addressed the theme "Thoughts and consideration for designing next generation service providers network". The virtual summit tackled the requirements of next generation SP networks.

The two-hour virtual event featured keynotes and a panel of C-level executives representing leading telecom operators Etisalat UAE, Etisalat Misr, Ooredoo Qatar, stc and Vodafone Qatar:

• Ramy Boctor, CTO, Vodafone Qatar
• Hani Mohammad Yassin, Sr. Director/Technology Strategy, Etisalat Group
• Günther Ottendorfer, CTIO, Ooredoo Qatar
• Mohamed Farag, Customer Experience & Technical Strategy Director, Etisalat Misr
• Yasser Najeeb Alswailem, Cyber Security VP, stc

Toni Eid, Founder and CEO of Telecom Review Group welcomed all participants and thanked Infoblox, the speakers and the panelists.

Jay Srage, the moderator of the session, gave an overview of the virtual summit's theme and the topics that will be discussed during the panel. He then gave the floor to Dr. Cherif Sleiman, Senior Vice President of International Business, Infoblox.

"We're all dealing with powerful market trends when it comes to services providers. We can start by the continuous challenge of declining ARPUs of voice and data that pushes SPs to contain cost by looking at ways to simplify their infrastructure and attack some of the operational complexities while aiming to find new revenue streams and monetizing news services. With 5G, the move to IP and IT has massive ramifications on telcos. All these dynamics require leadership and mindset change. From that perspective, we will show how Infoblox is helping companies to contain cost", he explained.

David Ayers, Product Marketing Manager, Infoblox also have a keynote presentation in which he highlighted the criteria for designing secure reliable DNS infrastructure in 5G network.

"DNS has become a crucial resource that operators need to manage and distribute just like other critical network functions, says Ayers. DNS role in taking any application or service function request, mapping the IP address and associating that with an active resource becomes very critical to the dynamic nature of 5G."

Infoblox product marketing manager examined 6 critical DNS design requirements for 5G:
1. Low latency
2. Scaling by orders of magnitude
3. Network-wide awareness
4. Edge security
5. Secure high-performance control plane
6. Real-time monitoring and management
7. Flexibility

5G use cases will require extremely low latency. DNS and latency are tightly coupled. Having the fastest DNS response is critical to subscribers' network quality. When comparing 5G vs LTE latency budget for DNS, Ayers highlighted that "Infoblox DNS is

designed to handle future 5G and edge based applications that require this ultra-low latency."

Telcos have been operating in the virtual machine mode, but now we're moving to cloud-native microservices. Without cloud-native virtual DNS, operators may find it almost impossible to scale DNS in real time for 5G. "Having a reliable DNS will be a critical foundation for a service-based architecture", he said.

"We need an IP address management system to manage all of this. In 4G, this was handled in the packet gateway or even maintained manually in some cases. However, now we're in the real-time world of container management," explained David Ayers when talking about network-wide awareness.

"Infoblox IP address management system is key to provision IP addresses in a fast way", he added.

When it comes to security, thousands of new locations increase the potential for security threats both from third-party applications at the edge. DNS can be leveraged to block many types of attacked at the edge before they advance further.

"There are many pitfalls in firewalls, and they sometimes block an attack

after it is happening. That is why DNS has to become an enhanced security function and become a critical part of revenues for CSPS", Ayers outlined.

Infoblox product marketing manager then tackled how DoT and DoH can create problems to service providers. "While DoT and DoH were designed to address DNS privacy issues for consumers, they introduced some DNS behavior changes to how browsers function. These changes create a lot of digital complexity and unintended network consequences for the providers."

The last criteria David Ayers addressed was real-time monitoring and management. For multi-domain networking, it is critical to have DNS monitor and operate seamlessly in real time across those multiple domains via a common control panel. This will pave the way to a multi-cloud world. In this context, he mentioned Infoblox telco cloud solutions which support telco cloud computing growth and expansion.

One last criteria is flexibility. Service providers require flexibility with simple pay-as-you-grow licensing that supports edge-based growth.

To kick off the panel, moderator Jay Srage, CEO of Centrigent, addressed

Hani Mohammad Yassin of Etisalat UAE, to share the lessons learned and the challenges faced in not just the implementation, but as well in the design, planning, and rolling out of the network.

Yassin commented, "We have deployed 5G across the UAE and recently we have achieved the highest speed network in the world for Etisalat UAE partially because of the 5G implementation, however, it wasn't very easy. We started planning ahead of time to reach where we are now.

The biggest challenge that we still face is spectrum. We have been talking about it for a long time and it's still a big issue in some of our footprint. We have been blessed in Etisalat UAE and Mobily because the governments have been proactive in providing huge amount of spectrum in Saudi Arabia and the UAE and made it available when we were first working on 5G deployments. However, we are still struggling to find the right spectrum in the sub-6 GHz," he added.

Yassin also highlighted that another challenge resides within the promises of 5G especially in its services awaited. In the past, he says, the main two services when deploying a network were voice and data; this is changing very rapidly with 5G. "Now we're talking about many services that we have to cater for and those services come with many requirements: voice, data, AR, VR, gaming, enterprise services, private vs public networks... so all of these dimensions that 5G bring make the network very complicated especially on how the data will be processed: is it going to be processed on the edge, or it is going to be sent all over the network...etc. all these considerations need to take shape before starting to deploy the network on a large scale."

Srage then addressed Mohamed Farag of Etisalat Misr to share his point of view regarding the business opportunities and the economic value that 5G is bringing to the table.

He said, "Currently Egypt is aggressively working on developing the infrastructure in all regions with a special focus on the capital and urban areas. Developing the infrastructure will create many business opportunities which will help reduce unemployment rate and attract foreign investments which will enhance in return the GDP value of the country. Having a strong telecom infrastructure is an evidence for having a proper expansion strategy in Egypt. I'm sure that the Egyptian market will soon be ready to introduce the 5G technology if we keep moving forward at this current pace of development."

"Enterprise opportunities that will be generated in the newly developed areas such as smart cities, IoT, and infrastructure, are enriched and accommodated by 5G. In addition, Fixed Wireless Access opportunity will be a practical use case where 5G will give us the opportunity to have a higher bandwidth, fiber-like speeds in the wireless technology with reduced costs."

Taking it form a different perspective, Srage asked Ramy Boctor from Vodafone Qatar about the company's strategy to launch these new services.

Boctor stressed that this is the first time we see IT and telco convergence. 5G standards are a 100% IT standards, a group of small applications talking to each other, because technology has evolved in a way that now software is key. According to Vodafone, their strategy is a little bit different. Indeed they appreciate the high speed of 5G but they are focusing on forming their teams on IT and software engineering skills.

He point out as well that technology nowadays is at its best to enable innovation. "It has never been cheaper to develop a software because everything is on cloud. You don't need to invest in hardware, you don't need to buy servers, you can develop a piece of software based on any cloud and it will work. This is how the startups are operating now", he said.

In the framework of the discussion on 'designing next-generation service providers' network,' the panelists felt that a lot had been talked about security for the networks and channeled their focus on issues related to protecting consumers and mobile users from attacks and ransomware on 4G as well as 5G.

The question of what stc was doing in terms of such cases was asked to Yasser Najeeb Alswailem, Cyber Security VP, stc.

He responded to the question by saying, "stc has built something called 'spam shield', basically an SMS spam shield that prevents the illegitimate SMSes that may harm end-users. We worked with local regulators CITC to govern even the SMS. Secondly, if the consumer is receiving messages from a genuine sender with a malicious link, there is no way within telecom technologies to stop this link or to inspect this link. We stop this illegitimate link or malware through the DNS. When this happens, the end-user may click the link but they don't know that we have stopped it at the DNS level. Our customers are enjoying secure digital services from our side."

The panelists sought then to address what future service providers needed to focus on when it came to rewiring their skillsets given the shift from telco to IT and how they can invest in their re-learning.

Tackling the question, Günther Ottendorfer, CTIO, Ooredoo Qatar said, "There are several key things that you need to be prepared for this change. One of them is network function virtualization (NFV). Virtualization technology is going to be very important in the future. Technology for the better use of the Edge network also will need consideration and as mentioned by other panelists, security will be a major issue. So if you want to become well prepared, those three areas would certainly be a good starting point. Building on that, you can specialize in different areas in the 5G world." **TR**

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Ocean Networks launches Caribbean Express submarine cable system project

Ocean Networks, Inc. (ONI) has launched its Caribbean Express (CX) Project, an 18-fiber pair submarine cable system linking Florida to Panama.

Using the Space Division Multiplexing (SDM) technology, The CX system will connect West Palm Beach (Florida), Balboa (Panama), Cancun (Mexico) and Cartagena (Colombia) with high speed, low latency fiber-optic connectivity.

The system will be designed for future connectivity to other countries along the route.

To complete the funding of this $300 million project, ONI has engaged Commenda Inc., an Atlanta-based merchant bank. For the past ten years,

Commenda has worked with family offices and corporate, strategic, and governmental funds as well as US and foreign banks to privately fund projects like the Caribbean Express network.

"The consumer demand for a new submarine cable system between Central America and the US is enormous. Traffic is nearly doubling every two years," says John R. Runningen, a founder and principal of Commenda. "As a result, ONI has already received significant subscriber interest from large IT and telecom customers who are anxious to expand their presence in these new and under-served consumer markets."

Several large corporate customers have shown immense interest in either a dedicated fiber pair or managed bandwidth as soon as this high speed SDM system is completed in early 2024, according to ONI. As the importance of a new submarine cable system like ONI's Caribbean Express is beneficial to both businesses and governments alike, ONI has set up 'branching Units in strategic locations to communicate with

governmental partners interested in the project.

Upon completion CX will be the only system that can offer new dedicated dark fiber pair IRUs in the Caribbean market.

"We are excited about launching this new submarine cable digital superhighway across the Caribbean." says Robert Hildebrecht, Ocean Networks' CFO. "We selected Commenda to raise the balance of the capital for this project based on the experience of their team and their successful track record in advising rapidly growing companies like ONI. With the support of Commenda and the experience of the ONI team, we fully expect the Caribbean Express cable system to be completed on schedule and under budget".

In conjunction with the remaining capital commitments, supplier RFQs will be issued next month to selected system suppliers, with the awarded Contracts in Force (CIF) by July 2021. The estimated Ready for Service (RFS) date will be in early 2024.

'Fiber Over Electric Poles' project by Oman Broadband soon to see the light

A number of contractors are bidding for the contract to design and install overhead fiber cables on electricity poles in designated areas of the country.

State-owned Oman Broadband Company, which is implementing the National Broadband Strategy,

said the objective of the 'Fiber Over Electricity Poles' project is to "utilise the existing electricity poles to lay Oman Broadband's FOC (fiber optic cable) for providing broadband services by backhauling mobile sites."

New poles may be installed where required and new trenches dug depending upon conditions at site, it noted.

As many as 37 mobile sites currently operated by the company will be covered through the 'Fiber Over Electricity Poles' project, utilising existing electricity poles and potentially constructing new ones in various governorates.

Trenching for a distance of around 360 kilometres will be required as well.

Oman Broadband — part of Oman ICT Group — has already been collaborating with utilities of Nama Group (formerly The Electricity Holding Company) to benefit from the massive electricity networks and associated optical fiber cables already installed by the latter, around 74,000 kilometres across the length and breadth of the Sultanate. Utilisation of Nama Group's fiber optic network will contribute towards avoiding double investments on similar projects as well as positively increase the pace of projects and achieves better financial returns and cost cutting, said Oman Broadband.

KKR to acquire Telefónica Chile's wholesale fiber optic network

KKR, a leading global investment firm, announced it has entered into an agreement with Telefónica, a leading global telecommunications company, to establish Chile's first open access wholesale fiber optics company with the mission to bring greater broadband access across Chile.

Under the agreement, KKR will acquire a majority stake in Telefónica Chile's existing fiber optic network, the largest fiber optic network in Chile, and make that network open access through a newly established independent Chilean company with assets managed locally. Telefónica will hold a 40% stake in the business. The newly formed enterprise will serve as Chile's first wholesale digital infrastructure network open to all current and future telecom operators in Chile, creating a competitive marketplace benefitting consumers and businesses across the country. Despite Chile leading Latin America in GDP per capita, it is currently third-ranked in fiber-to-the-home connectivity. Fiber optic service offers very high reliability and speeds 10-1000 times faster than cable and legacy telecommunication networks.

Upon approval, the new business plans to expand broadband coverage in Chile from 2 million households today to a minimum of 3.5 million households by 2023, and to provide wholesale service to more than 40,000 businesses, telecom towers, and small cells. The newly formed network will provide access to under-served areas with more than two-thirds of households covered by the network being outside of high-income urban areas.

The transaction is valued at approximately US$1 billion and is expected to close in the first half of 2021, subject to regulatory approvals.

The state-of-the-art fiber optic network is built to the highest technical standards, with its existing infrastructure having supported reliable service over the past year when COVID-induced disruptions substantially increased the need for greater bandwidth for tele-work, school, health, and more. In 2020, the network, which is being transferred to the newly formed company, was recognized as the Best and Fastest Fixed Network in Chile.

The new company will be controlled by KKR and will leverage the firm's global experience in digital infrastructure and in operating and deploying fiber networks, including related investments in FiberCop in Italy, Hyperoptic in the U.K., Deutsche Glasfaser in Germany, Telxius in Europe and Latin America, Hivory in France, Global Technical Realty in Europe, Bharti Infratel in India, and Pinnacle Towers in the Philippines.

KKR is making the investment through its Global Infrastructure Investors III Fund. KKR first established its global infrastructure team and strategy in 2008 and has since been one of the most active infrastructure investors around the world. Over this period, the firm has deployed more than $24 billion across approximately 40 infrastructure investments, and currently has a team of 45 dedicated investment professionals.

Moov Africa to set up submarine cable from Morocco to Togo

Moov-Africa announced it will deploy a submarine cable from Casablanca to Togo.

According to Abdellah Tabhiret, managing director of Moov-Africa, "This cable will develop and improve international coverage and connectivity, especially national connectivity". "It has a great capacity which will allow internet users to surf properly", he added.

Following the statement, the company hopes to regain the trust of its subscribers. Indeed, from the first half of 2019 through the first half of 2020, the telecom operator lost around 500,000 users (dipping from 3.608 million to 3.108 million), according to data released by its parent company, Maroc Télécom.

Opportunities in the edge computing ecosystem

Known with many names such as 'edge data centre', 'intelligent edge','edge node' or just 'the edge', edge computing has come out of the shell and is garnering interest from mobile systems and the Internet of Things (IoT) as it fulfills the requirements for low latency and high resilience.

All in all, edge computing can be defined as the method of processing and storing data either where it's created or close to where it's generated — 'the edge' — be it a hand-held device, an internet-connected machine in a warehouse, or a car.

As the demand for low latency, high bandwidth, device processing and data offloading grows, edge computing brings processing capabilities closer to the end-user be it for live streaming, gaming or enabling secure and resilient processing operations for organizations.

Edge computing reduces data transport requirements, saving network bandwidth costs and avoiding data

storage increases. For instance, by storing content closer to its users, a content distribution network (CDN) can improve the performance and efficiency of its services drastically.

Edge computing can also be modeled as an extension of the cloud by delivering services from whichever location meets performance requirements for speed and timeliness combined with central cloud services for large-scale data analytics and management.

With the right collaboration with edge computing vendors, Edge has the potential to facilitate the development of many new types of services to create a seamless user experience.

One example would be an enterprise cloud service that trains a machine learning model, and then serves the latest model at the edge. The way to ensure consistency between cloud and edge applications is the adoption of

cloud-native technologies for the edge node.

The requirements of recent technology trends are driving the modality shift to edge computing, most prominently in these key areas:

IoT and edge computing: Deep learning technology is being used for mining accurate information from raw sensor data from IoT devices installed in complex environments for informatics fields such as vision recognition, bioinformatics and natural language processing. The multilayer structure of deep learning methodology complements the edge computing environment. It is also being used in industrial networks that contain thousands of field devices, sensors, actuators generating a massive amount of data. With edge computing, the data can be processed at the field device for analysis and decision making. However, the limited processing capability of existing edge nodes will require innovation to optimize the performance of IoT deep learning applications with edge computing in the days ahead.

Autonomous systems: The operability of autonomous systems, including cars, drones, robots, medical or industrial machines depends on how efficiently data is processed for achieving speed, accuracy, security and reliability. As more and more organizations adopt automation for their operations, the scope of edge computing is only going to grow. According to Grand View Research, the global edge computing market size is expected to reach USD 28.84 billion by 2025, with a CAGR of 54%.

Artificial intelligence: AI has moved out from the data centers to the edge of networks, according to experts. Edge AI is rapidly making its way into everything from smartphones and smart speakers to automotive sensors and security cameras. As IoT implementations have matured, there has been an increased interest in applying AI at the point of generation for real-time event detection. The AI that could impact many of our daily experiences will be composed of calculations on edge systems.

According to a report by Analysys Mason, enterprises will spend an average of 30 percent of their IT budgets on edge cloud computing over the next three years. Tech giants such as Amazon, Google, Apple have invested heavily to refine their edge to facilitate AI to serve their customers quickly. Investing in Edge AI is a sensible value proposition for growing businesses in the ICT sector.

VR/AR: Virtual Reality (VR) and Augmented Reality (AR) require extremely fast response time for optimal performance. Today's networks hardly provide that speed. To put things to perspective, VR/ AR requires a latency of less than 20 milliseconds to provide an immersive user experience. Edge computing provides the power and speed to achieve this. Virtual and augmented realities are being adopted across various sectors. For example, in education, virtual excursions, using simulated situations, virtual environments are improving and maximizing the benefits of training at minimal costs. Similarly, in the case of medicine, doctors and caregivers can treat patients anywhere on the planet given the combination of VR/AR and the low-latency in edge computing. The vast computations that make VR and AR systems such a natural-feeling experience will also be edge-based.

Modern-day service providers have the capabilities of delivering intelligent traffic routing from the mobile network to the optimal location of the enterprise application as well as have people on the ground along with expert knowledge of network topology, network efficiency and device management.

The transition to cloud-native network functions and distributed cloud computing enables service providers to move beyond legacy connectivity-service models and opens new avenues to related industries. By capturing the edge opportunity to add value, telecom service providers must understand the business models, the use cases and define clear market-ready strategies to grow revenues outside connectivity. **TR**

Cybersecurity predictions to watch out for in 2021

In times when SolarWinds-type cyberattacks are on the rise, there is every reason for organizations to raise red flags on issues related to cybersecurity. In what is dubbed as the biggest cyberspace attack in US history, hackers reportedly gained entry into networks when over 18,000 private and government users downloaded software injected with malicious code. After entering, they were able to monitor the internal emails of some of the important government agencies.

Furthermore, a report published by NetScout's Atlas security engineering and response team, states that the number of distributed denial-of-service (DDoS) attacks in 2020 exceeded 10 million, up from 8.5 million recorded in 2019. Since March 2020, the increase in work-from-home trends has led DDoS attacks to rise to 800,000 cases each month.

Organizations, especially those with large remote user populations or hybrid work environments need to ensure that their IT infrastructure is best suited to respond to these unwarranted incidents.

The combination of technological advances such as 5G with growth in connected devices has led to several

trends in cybersecurity that could take place in 2021 and beyond.

Remote infrastructure vulnerability: Working remotely has given rise to a vulnerable attack landscape where criminals recognize the weak points and capitalize on them, particularly with unsecured legacy security architecture such as a virtual private network (VPN). Several companies have already been a victim of such attacks and this trend will likely continue. It would do well for companies to upgrade their VPN and RDP (Remote Desktop Protocol) infrastructures.

Automation of smart devices:
As investments pick up to turn smart devices into fully automated machines with in-built intelligence for various projects, it will have an impact on latency, connectivity and security issues. The greater the interconnectivity with external services, the higher exposure to attacks as MEC and edge cloud services utilize the 5G high speed for smart collaboration between systems.

Cloud centralization: As we transition to APIs for web applications, the internet will work as an interconnected service workshop. Organizations providing services from the edge to central clouds are likely to increase the risk of cyberattacks if a component fails due to connectivity, the whole system can be impacted. Cloud service solutions providers need to be on top of the latest web security threats that safeguard resources and data to avoid the probability of large-scale outages and collateral damages.

Phishing attacks: As humans, we are emotional beings and phishing attacks target our emotions. Emails that prompt us to click on malicious links will be on the rise. As per Verizon's 2020 Data Breach Investigations Report, attackers used phishing in 22% of the investigated breaches. The usual suspects such as targeted business email compromise (BEC) attacks or even the new entry 'vishing' (voice phishing) attack will keep prying our privacy.

Ransomware menace: Ransomware has brought some companies to their knees by asking them to pay up hefty sums in return for their compromised data. That is not going to go away anytime soon. According to a recent Gartner report, "ransomware has evolved beyond the commodity, widespread attacks intended to infect a single endpoint to include more advanced techniques, such as fileless malware and data exfiltration [...]. These new strains of ransomware make prevention and planning more important than ever to prevent ransomware attacks."

Internet of Behavior (IoB): As data gathered from IoT devices, smartphones, wearables, etc are used to understand customer behaviour by marketing companies, experts feel it will be a challenge to maintain the balance between user experience and privacy. Companies will need to be extra cautious with the amount of personal data at their disposal and draft policies to safeguard them accordingly.

Bad bots: Bad bots steal data from sites without authorization for reuse (e.g., pricing, inventory levels) to gain a competitive advantage. The hardcore ones even extend to criminal activities, such as fraud and theft. Bad bots are looming threats to enterprises and businesses as it is not easy to detect their presence and operating technique. Companies must be mindful of such trends to effectively protect themselves and their users' data from malicious attacks.

Security validation: Validating security effectiveness is critical for businesses today. With cyberattacks on the rise with increasing sophistication and motivation, security validation facilitates companies to constantly measure, handle and improve their cybersecurity effectiveness. With work from home trends, vulnerable attack surfaces, and stealthy techniques used by hackers, companies are seriously considering in-house security validation to fully managed or co-managed security validation. This

trend will see faster adoption in the coming days.

Distribution of fake news: Fake news distorts facts and misleads the readers. Social media platforms, including Facebook, have been trying to stop the circulation of fake news in their channels but to no avail. The point to be considered is that these technologies are not capable of detection and classification yet. AI needs the support of scarcely available historical data to understand if those are genuine or fake. There are thousands of such news floating on the internet that are designed to achieve ulterior motives. Even if a fake campaign is identified, malicious players develop a better one. All in all, we are going to need improvement in artificial intelligence and deep learning solutions for better detection and prevention of manipulation of data privacy.

As we usher into a digital-first world, data privacy must be safeguarded at all costs. Greater agility and innovation are warranted from each responsible player to bring efficient data protection framework in place in the digital ecosystem. **TR**

> Since March 2020, the increase in work-from-home trends has led DDoS attacks to rise to 800,000 cases each month

Huawei and ICPC Foundation successfully launch International Training Camp Phase 1

The ICPC Training Camp powered by Huawei has officially kicked off. This event is an international program initiated by the International Collegiate Programming Contest University Commons (ICPCU). It aims to provide an extended platform to support high-level programming training and innovation for college students who are passionate about programming and algorithms. This online event has attracted over 700 highly skilled ICPC contestants, who have been competing and learning from the previous ICPC World Finals champions.

 In addition, this event has attracted over 3,000 online viewers from around the world, resulting in a productive exchange opportunity for global programing community.

Professor William B. Poucher, President of the ICPC Foundation, has addressed all the participants and emphasized the importance of Huawei's support for global ICPC talent cultivation, as well as the importance of joint collaboration between ICPC community, the ICPCU, and Huawei in terms of providing greater value for global scientific and technological progress.

William Xu, Huawei's Director of the Board and the President of the Institute of Strategic Research, expressed his warm welcome and gratitude to all contestants, coaches, organizers, and volunteers, and pledged to continue providing advanced training and innovation platforms for ICPC talents, aiding the exploration of new challenging topics and the promotion of scientific and technological progress.

The ICPC Training Camp powered by Huawei will continue to gather together top contestants from ICPC global community, including ICPC coaches and alumni, industry and academia experts. Its goal is to share problem-solving strategies and cutting-edge topics through competitions and lectures, enable contestants to enhance their programming skills and industry knowledge, as well as improve their performance during the upcoming competition season.

The International Collegiate Programming Contest (ICPC) is the world's oldest, largest and most prestigious programming competition, often considered as the Olympics of programming competitions. ICPC Competition has started since the 1970s. Over 60,000 students from 115 countries and regions are participating in the program every year. More than 400,000 ICPC alumni have become the core elites in high-tech companies, academic research institutions, startups and other organizations.

Nokia to improve radio and transport network in Saudi Arabia

Nokia and Mobily have extended their managed services partnership by signing a three-year agreement under which Nokia will manage and maintain the radio and transport network in Riyadh and other regions.

Nokia has been a managed services partner to Mobily for the past ten years. The comprehensive managed services partnership will see Nokia

supporting a range of operating capabilities which will enable Mobily to offer a superior user experience through improved service and network performance. It will also increase the overall efficiency of the network operation.

Mobily will also be leveraging Nokia's Global Delivery Centers (GDC), which will bring uniquely-skilled staff, tools and world-class operational capabilities throughout the managed services scope. Nokia's service delivery excellence will further allow Mobily to focus on expansion and bring new services to the Saudi market.

Alaa Malki, CTO at Mobily, said: "Operational transformation is needed to manage a mix of technologies. Nokia's global experience in network

operations and best practices helps us to be the forerunner in this transformation. Partnership with Nokia marks a new chapter in our collaboration and complements our business objectives. We look forward to further enhancing the end-user experience through continuous improvement of our network quality and service agility."

Tareq Khalaf, head of the customer team at Nokia, said: "This deal showcases our continued commitment to support Mobily's network at superior quality levels. We are driven to deliver streamlined operations that help our customers respond quickly to fast-changing user demands. Together with Mobily, we'll be able to connect with a broader ecosystem and deliver the highest degree of efficiency."

Huawei supports Telefonica in reinforcing 600G and 800G signal transmission

Huawei and Telefonica (Spain) have completed a pilot on wavelength division multiplexing (WDM) photonic meshes that support Telefonica's Fusion IP Network. This pilot aims to strengthen the Fusion Network, by delivering greater quality and capacity in the face of emerging 5G and other new services.

The high single-wavelength 600G and 800G transmission speeds that Telefonica has achieved using Huawei OSN 9800 devices on the photonic mesh network in Madrid (spanning 47 km) is a prime example of this.

Juan José Marfil, the director of transport and IP connectivity at Telefonica, pointed out: "These pilots on the photonic meshes, in which signals are transmitted over optical channels without the need to switch to the electrical domain, are important milestones that build on the 400G speed that was achieved in 2019, also in Madrid. The goal is to begin implementing the 400G speed this year and subsequently optimize the Fusion IP Network to meet the needs for higher capacity and speed in view of the exponential growth of both connected devices and data transmission."

Enhancing transmission speed is key to the development strategy of Telefonica. This is because these networks fundamentally carry all of the company's services, whether it is for residential customers or large companies, and must also adapt to support the yearly 30% increase in traffic.

The use of 800G channels achieves full capacity for short-distance transmission. An example of this is using these new channels to transmit the equivalent of 500 one-hour HD quality movies over a pair of optical fibers in just a second.

Moreover, Telefonica will leverage the sustainability of its fast transmission technology to reduce energy consumption by 40% to 60% and become an industry pioneer for environmental sustainability.

CommScope reports Q4 and FY2020 results

CommScope Holding Company, Inc. (NASDAQ: COMM), a global leader in network connectivity solutions, reported results for the quarter and year ended December 31, 2020.

Revenue in Q4 declined 7% to $2.13 billion, which missed the consensus estimate of $2.18 billion in sales. That resulted in adjusted earnings per share of $0.59, topping the analyst forecast of $0.44 per share in adjusted profits.

The telecommunications equipment company reported adjusted earnings

before interest, taxes, depreciation, and amortization (EBITDA) of $362.2 million.

Over the last four quarters, the company has surpassed consensus EPS estimates four times.

Net sales in 2020 increased 1.1% year over year to $8.44 billion primarily due to a year over year increase in the Broadband Networks segment. On a combined company basis, net sales decreased 13.5% year over year primarily due to decreases in the Home Networks, Outdoor Wireless Networks and Venue and Campus Networks segments.

CommScope generated a net loss of $(573.4) million, or $(3.20) per share, in 2020, compared to the prior year net loss of $(929.5) million, or $(5.02) per share. Non-GAAP adjusted net income for 2020 was $371.0 million, or $1.56 per share, versus $479.4 million, or $2.15 per share, in 2019.

Non-GAAP adjusted EBITDA decreased 6.3% to $1,215.2 million compared to the prior year. On a combined company basis, non-GAAP adjusted EBITDA decreased 11.2% and represented 14.4% of net sales compared to 14.0% of net sales in 2019. The Company estimates that 2020 non-GAAP adjusted EBITDA was negatively impacted by approximately $70 million related to COVID-19 supply chain disruptions and certain other incremental costs.

CommScope says it has improved liquidity and de-risked its capital structure, while the company will continue paying down debt going forward. Looking ahead to 2021, the company expects the shift to remote work and learning to keep driving demand for broadband networks. There will also be a C-band auction in the second half of the year that is expected to boost spending on cell towers. Many venues and commercial facilities are also upgrading networks and migrating to the cloud.

Qualcomm launches world's first 10 Gigabit 5G modem-RF system

Qualcomm Technologies, Inc. announced the Snapdragon X65 5G Modem-RF System, its fourth-generation 5G modem-to-antenna solution. It is the world's first 10 Gigabit 5G and the first 3GPP release 16 modem-RF system, which is currently sampling to OEMs and targeting commercial device launches in 2021. Snapdragon X65

is the Company's biggest leap in 5G solutions since the commercialization of its first modem-RF system.

It is designed to support the fastest 5G speeds currently available with fiber-like wireless performance and makes best use of available spectrum for ultimate network flexibility, capacity and coverage. In addition

to the Snapdragon X65, Qualcomm Technologies also announced the Snapdragon X62 5G Modem-RF System, a modem-to-antenna solution optimized for mainstream adoption of mobile broadband applications.

Many improvements in the Modem-RF System are designed to deliver a superior 5G experience with faster cellular speeds, broader coverage and support for all-day battery life. Snapdragon X65 is poised to support a new generation of premium smartphones and the expansion of 5G in segments such as PCs, mobile hotspots, industrial IoT, fixed wireless access, and 5G private networks. Qualcomm Technologies is also introducing a widely accessible sibling of the Snapdragon X65 – the Snapdragon X62 5G Modem-RF System. The Snapdragon X62 is a 5G modem-to-antenna solution supporting up to multi-Gigabit downloads for mobile broadband applications.

Cisco reports Q2 earning results

Cisco reported second quarter results for the period ended January 23, 2021 of $12.0 billion, net income on a generally accepted accounting principles (GAAP) basis of $2.5 billion or $0.60 per share, and non-GAAP net income of $3.4 billion or $0.79 per share.

"We are seeing encouraging signs of strength across our business showing

how our technology will be a powerful engine for recovery and growth," said Chuck Robbins, chairman and CEO of Cisco. "Our team delivered a strong performance as we partnered with customers on accelerating their digital transformation and driving secure, remote work."

"Cisco executed well in Q2, delivering growth in orders, strong margins,

and growth in non-GAAP EPS, while continuing to grow deferred revenue in double-digits through the shift to more software and subscriptions," said Scott Herren, CFO of Cisco.

Cisco increases quarterly cash dividend
Cisco declared a quarterly dividend of $0.37 per common share, a $0.01 increase or up 3% over the previous quarter's dividend, to be paid on April 28, 2021 to all stockholders of record as of the close of business on April 6, 2021.

Financial Summary
Total revenue was flat year-on-year at $12.0 billion, with product revenue down 1% and service revenue up 2%. Revenue by geographic segment was: Americas down 1%, EMEA up 2%, and APJC down 4%. Product revenue was led by growth in Security, up 10%. Infrastructure Platforms was down 3% and Applications was flat.

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The need to reimagine data center readiness

Like it or not, we are living in the world of big data. Everyone has begun to take notice of its usage so much that it has been dubbed as the "new oil." With each additional hand-held device joining the connected world, there will be the generation of more data. However, the usefulness of the data is in the processing. This is where the data centers come in to support new types of workloads and users. They house computer systems and resources that facilitate the delivery of shared applications and data. Data centers are the backbone of organizations to store and secure their information.

A future-ready data center architecture will be in everyone's mind as the ICT market continues to grow at a rapid scale. Having the right manpower armed with the right skills has to be the number one priority in data center management.

Here's a list of skill sets necessary to take up the challenges in data centers of the future.

Edge computing

With the growth in Internet of Things (IoT) use cases, the adoption of edge computing seems to be the obvious choice for companies to assess data from IoT devices and send them back to remote or on-premises data centers.

Since the edge servers are closer to the requesting client machine, it has its own set of differences from origin servers. Edge servers help ease the workload of origin servers by storing content in localized areas. Skills sets in virtual function networking, system design, database modeling, and security will be inevitable for data centers.

Cloud architect

Cloud technology has evolved from traditional IT to cloud computing, and now to cloud-native. Enterprises have driven IT systems to become cloud-based, and the multi-cloud connection has become essential to cut costs, increase service reliability, and operate multi-cloud disaster recovery. The introduction of 5G is undoubtedly consolidating the cloud-first environment; however, the benefits of 5G networks for faster data transfers are also generating the issue of security. Data centers cannot function without expertise in cloud security and cloud architecture. Cloud architects can assess the technical requirements of a project and turn them into the architecture and design that will facilitate the completion of products. Cloud architects are expected to have advanced knowledge of network architectural principles as well as operating systems such as Windows, Unix Solaris, Linux, Unix, Ubuntu, etc.

Data center technician

Data center technicians install and maintain data servers and network equipment. Their responsibility also includes monitoring the day-to-day performance of servers, well-coordinated environment for servers, and troubleshooting network and server problems. Data center technicians are critical for running hardware diagnostics and detecting failing parts for quick response to server and network issues. Data center modernization can integrate servers, storage, information management, and data protection.

Hybrid IT management

Organizations today want to develop an open, hybrid cloud strategy that can modernize its operations and accelerate its digital transformation journey. Hybrid IT management brings cloud and traditional infrastructure and services that can help companies offer new innovative offerings for their customers. As enterprises use cloud services such as AWS, Microsoft Azure and Google Cloud Platform to host and serve applications and services, the on-premises data center will require skills that will help legacy applications and data privacy regulations transition into the cloud-based IT infrastructure. Hybrid IT management solutions provide end-to-end automation along with key IT functional areas, including service management, service fulfillment, service assurance and governance.

Data security

Last but not the least, the security and management of data in the hyper-connected digital environment are critical. Without a proper cybersecurity strategy, cloud migration exposes businesses to various risks. With the digital landscape changing at such a rapid pace, data centers must have staff qualified in the latest data security skills and network intelligence for seamless performance, data analysis, and automation of functions without any security threats.

As cloud services begin to unfold the benefits of digital transformation, data center architecture will impact business, customers and the entire ecosystem. Data center managers would do well to have professionals with the above qualifications on their radar as the efficient running of data processing centers will be an irreplaceable component of every digital transformation journey. **TR**

> As cloud services begin to unfold the benefits of digital transformation, data center architecture will impact business, customers and the entire ecosystem

Efficiency and sustainability:
Key factors for telcos deploying 5G networks

5G will be the most transformative communications technology and will enable a universe of new services, including advanced energy management capabilities that will be critical to solving growing energy and sustainability challenges.

However, figures from the GSM Association show that the telecoms industry currently consumes around 3 per cent of global energy. But as Per Lindberg, chief executive at Ranplan Wireless, points out, "The onset and rollout of 5G globally could result in a potential increase in data traffic of up to a thousand times. Additionally, the infrastructure to cope with the 5G era could arguably consume up to three times as much energy." In addition, new research highlights the practical challenges of 5G energy management facing telecommunications operators. Estimates suggest 5G networks can be up to 90% more efficient per traffic unit than their 4G predecessors, but they still require far more energy due to increased network density, heavy reliance on IT systems and infrastructure, and increased network use and accelerated traffic growth.

The report Why Energy Management Is Critical To 5G Success from

telecommunications consultancy STL Partners and Vertiv, a global provider of critical digital infrastructure and continuity solutions, concludes telecom operators should address these challenges in two ways: By adopting energy efficiency best practices across their networks, and by encouraging their customers to adopt 5G-enabled services to reduce consumption and emissions in all walks of life.

STL Partners estimates global 5G traffic will overtake 3G/4G as soon as 2025, making sustainability an urgent priority for operators. In fact, 40% of enterprises surveyed for the report indicated energy efficiency should be the first or second priority for telecom operators when deploying 5G networks.

But how can 5G practically increase energy efficiency? According to the UN, one way to do it is combining 5G technology with IoT because devices will be able to power up and shut down automatically when not needed, which will not only increase energy efficiency, but reduce greenhouse gas emissions, enable more use of renewable energy, reduce air and water pollution, minimize water and food waste, and protect wildlife as well. According to the UN, 68 % of the world's population will live in cities by 2050. City governments and businesses are looking to 5G, artificial intelligence (AI) and IoT technology to create smart cities where sensors, cameras and smart phones will be linked; the connectivity and speed of these networks will enable cities to be better managed and more efficient and sustainable.

International standards have called for 5G to require much less energy than 4G, which means using less power while transmitting more data. For example, one kilowatt-hour (kWh) of electricity is needed to download 300 high-definition movies in 4G; with 5G, one kWh can download 5,000 ultra-high-definition movies.

As previously mentioned, challenges can be addressed by adopting best practices aimed at mitigating those increases and reducing costs. The report by STL Partners and Vertiv uses

research including a survey of 500 enterprises from around the world to outline the challenges telcos face as they wrestle with the increased energy use and costs associated with 5G, then provides some of the best practices to face them, organized across five categories:

1. Network technology: Deploying hardware and software designed and operated for efficiency
2. Infrastructure facilities: Including new edge data centers to support cloud native IT
3. Infrastructure management: Deploying the appropriate hardware and software to measure, monitor, manage, improve and automate the network
4. Organization and evaluation: Taking a holistic, full lifecycle view of costs and investments across the network
5. Working with others: Embracing innovative and non-traditional commercial models, standards and collaboration

"Telecom operators making meaningful energy and cost reductions are doing so by evaluating the entire ecosystems around their network operations – people, objectives, infrastructure and partners," said Scott Armul, vice president for global DC power and outside plant at Vertiv. "Because of the reliance on IT to enable 5G applications, a high degree of collaboration will be required across operators, OEMs and infrastructure providers, and customers to ensure deployments are optimized and every possible efficiency is pursued."

5G as a tool for sustainability
Network efficiency improvements and best practices, while important, are only one piece of the energy puzzle that comes with 5G. Those efforts must be paired with a more holistic, societal approach to curbing energy use and emissions that leverages 5G capabilities in ways far beyond the control of the telco operator.

"Operators are deploying 5G networks to grow new revenues. This growth will come from new connectivity and applications enabling operators' customers' own transformation

journeys," said Phil Laidler, director at STL Partners. "To be credible, informed partners for their customers, operators must lead by example. Energy strategy is a great place to start."

Opportunities for Progress
In terms of influencing customer behaviors in order to reduce energy consumption and carbon emissions, the report identified three industries with the potential for significant improvement through the use of 5G services. The manufacturing sector could achieve up to $730 billion worth of benefits by 2030 through the use of 5G to enable advanced predictive maintenance and automation. Transportation and logistics could get up to $280 billion in benefits by 2030 through advanced driver assistance, connected traffic infrastructure, and automated home deliveries. Plus, 5G could allow the healthcare sector to provide improved access to healthcare services for up to 1 billion patients by 2030 while simultaneously reducing emissions through higher asset utilization, reduced patient and clinician travel, and higher clinician productivity.

Influencing such behaviors is critical to operators' efforts to mitigate the environmental impact of 5G, but there is work to do in order to build the partnerships needed. Just 37% of those surveyed said they see operators as credible partners in reducing carbon emissions today, but 56% said they believed telcos could be credible partners in the future.

Paul Marshall, chief technology officer and founder of IoT specialist Eseye, goes as far as to predict 5G will be the first carbon-neutral network. "The energy-saving potential of 5G connectivity, coupled with IoT technology, is huge," he says. "Better-connected devices, armed with data provided to them every second, allows for autonomous operation.

"It is this autonomy that will usher in a reduction in energy usage as more and more devices will be able to shut down when not in use to conserve energy, then powering up again in time for when they are required, without any human input." **TR**

Infinet Wireless expands footprint with new regional office in Delhi

Infinet Wireless, the global leader in fixed wireless broadband connectivity, has opened a new regional office in India in line with the company's growth strategy of accessing emerging markets. This new presence will be managed by Hari Shanker Pandey, a Regional Director. Mr. Pandey has considerable experience in the telecom and high-tech industry having been in charge of business development and sales growth in various companies. He will steer the strategic growth directions of Infinet Wireless by applying his knowledge and skills to work on expanding Infinet Wireless' presence in India and nearby countries.

Infinet Wireless' office in this region was opened at the beginning of 2021. At the moment, the company is actively preparing the ground for testing deployment of its equipment and dealing with local partners and integrators. Infinet Wireless' goals in the market are to reach out to local telecom segment, including connection provision to corporate and municipal clients, as well as middle-scale and large-scale operators; organizing radio links with mobile objects in the mining industry and deployment of technological lines for customers of different types. Infinet Wireless is planning the launch of its innovative solutions to a completely new market for the company, starting with its Quanta 5 / Quanta 6 product family aimed at organizing PtP radio links. In addition, Infinet Wireless can offer base stations and subscriber terminals of InfiMAN Evolution product family. These provide excellent throughput for PtMP radio links, and are compatible with Infinet Wireless products of previous generation, enabling operators to both deploy new infrastructures and expand coverage of existing networks in the 4.9–6.5 GHz range.

Tata Communications partners with Google Cloud India for public cloud services

Tata Communications, a global digital ecosystem enabler, announced its partnership with Google Cloud to drive cloud adoption and transform Indian businesses. With this partnership, Tata Communications has further expanded their managed public cloud services portfolio to include capabilities for Google Cloud.

The partnership between Tata Communications and Google Cloud India will enable organisations to deploy and access Google Cloud services through Tata Communications' IZO™ Managed Cloud while providing them ease-of-use coupled with end-to-end services, including cloud architecture planning, workload migration and ongoing operational support.

As a Google Cloud India Partner, Tata Communications will support organisations with services across infrastructure modernisation, data centre transformation, application modernisation, smart analytics, multi-cloud deployments and more.

Tata Communications IZO™ Managed Cloud provides the right expertise, infrastructure, and support services to drive business growth and improve performance. Tata Communications' IZO™ Cloud Command portal offers a single-pane-of-glass orchestration tool which integrates different enterprise IT environments into a single dashboard and simplifies the management and orchestration of the IT estate, offering a unified cloud experience. It provides a comprehensive view of IT resource utilisation (across on-premise, private, Google Cloud), thus enabling greater control for the customer, resulting in cost efficiencies and improved productivity.

With the current global scenario, there is wider recognition for business resilience and agility that cloud enables; most businesses are now beginning to explore a cloud-first model. DevOps, a set of practices that combine software development and IT operations, has become an important requirement for enterprises. To make applications future ready, businesses are modernising them by leveraging Containers and Kubernetes (an open-source platform for container orchestration), as they offer businesses the scalability and portability they need to be agile and build a competitive edge, enabling self-service provisioning and capacity on-demand with ease.

Tata Communications' services can manage Kubernetes on Google Cloud platform that can enable application modernisation seamlessly, which is an essential need as enterprises graduate in the hybrid multi-cloud environments.

South Africa's MTN records high earnings after tower sales

According to MTN Group, South Africa's largest mobile operator by subscribers, it is expecting its annual profit to rise by up to 70%, after the sale of Uganda and Ghana tower joint ventures.

The company said it expects headline earnings per share, a key financials metric for South African firms, to be between 702 and 796 South African cents for the year ended Dec. 31 compared with 468 cents a year ago.

The Johannesburg-based company is scheduled to report more detailed results on March 10.

MTN has been selling assets to streamline the company and pay down debt, and has a target of raising 25 billion rand over the next three-to-five years.

Huawei and China Mobile deploy world's first 4.9 Ghz 5G indoor network with peak rate exceeding 3Gbps

Huawei and China Mobile Shanghai deployed the world's first 4.9 GHz commercial LampSite network in Shanghai, China. This is the first time that an aggregate bandwidth of 200 MHz on the 2.6 and 4.9 GHz bands and distributed Massive MIMO have been simultaneously implemented in digital indoor networks. With the peak rate exceeding 3 Gbps, the performance is comparable to that of an active antenna unit (AAU), satisfying the network requirements to provide premium service experience at large stadiums where the traffic demand and user density are high. This deployment was completed at the Shanghai New International Expo Center (SNIEC) where Mobile World Congress (MWC) Shanghai, an annual telecom industry event, is hosted. In 2019, nearly 60,000 people attended this event. The latest 4.9 GHz LampSite units supporting a bandwidth of 100 MHz were adopted to work together with the incumbent 2.6 GHz band to ensure a bandwidth of 200 MHz through carrier aggregation. This enhances the coverage of indoor networks at capacity-demanding indoor hotspots, including stadiums, airports, and railway stations, to deliver premium experience to mobile users.

China Mobile Shanghai has been a leading telecom carrier in developing 5G networks. To date, it has constructed more than 13,000 5G sites, basically achieving continuous coverage in the city.

This telecom carrier boasts leading networks and evident technological advantages. It has been working with Huawei to explore innovative solutions to guarantee mobile excellent user experience in various scenarios. 4.9 GHz is an ideal option for telecom carriers to enhance coverage in indoor hotspots, ensuring premium indoor experience for toC services. This band is also important to ensure 5G coverage in high-quality toB applications.

China Mobile Shanghai will continue to work with Huawei to accelerate the deployment of 5G sites to deliver the continuous coverage required to ensure premium service experience across the city. It will also continue to promote the collaboration of the telecom industry with other industries, such as finance, shipping, and trade to cement Shanghai's leadership in applying 5G to vertical industries by leveraging their respective leading advantages.

# Nepal selects frequency to embark on 5G services

Nepal's National Telecommunication Authority (NTA) has determined its 5G frequency as the country prepares to deploy 5G service. NTA will follow the recommendations set out by the National Frequency Management Forum, a body initiated by the NTA, the Ministry of Communications & Information Technology (MoCIT) and telecommunications operators.

According to NTA's spokesperson, Meen Prasad Aryal, the National Radio Frequency Policy Determination Committee has received a proposal with recommendations using 700 MHz,

900 MHz, 2300 MHz and 2600 MHz for the low-band spectrum, 3300 MHz, 3400 MHz, 3600 MHz and 4100 MHz for the mid-band spectrum, and 26 GHz for the high-band spectrum.

Established to manage existing and new spectrums, the National Frequency Management Forum performed studies for 5G spectrums before recommending a suitable spectrum for allocation. The National Radio Frequency Policy Determination Committee must now approve NTA's proposed frequencies before spectrums will be allocated to operators.

Verizon wins 5G spectrum auction of $81 billion
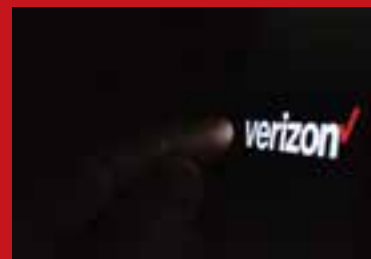
Verizon and AT&T were announced by the FCC the winners of an $81 billion auction for the license to use important 5G airwaves. The high amounts spent by the telcos reflect the importance of securing licensing for the airwaves.

In fact, Verizon, through its Cellco Partnership subsidiary, bid nearly $45.5 billion on the airwaves. AT&T, through AT&T Spectrum Frontiers, bid $23.4 billion. The third-largest U.S. carrier, T-Mobile, bid the third-largest amount of money, $9.3 billion.

"These record-breaking results highlight the demand and critical need for more licensed mid-band spectrum and demonstrate the importance of developing a robust spectrum auction pipeline," said CTIA CEO Meredith Baker in a statement. CTIA is a trade group that represents the wireless industry.

The spectrum offered in this auction is the 280 megahertz – a midband spectrum – which is well suited for 5G networks and allows the transmission of huge amounts of data with a wavelength that can travel long distances.

The 280 MHz of spectrum was split into smaller 20 MHz blocks and further divided into 406 geographic regions. Altogether, there were 5,684 licenses up for grabs. In total, the three biggest U.S. carriers won 90% of the licenses up for auction.

Capacity Middle East

This year's edition will be both online and physical. The physical part of the event will take place 18-19 May at Intercontinental Dubai - Festival City.

Place: online and physical in Dubai, UAE

23 MARCH

19 MAY

BEYOND 5G
The endless benefits of 5G to operators

Telecom Review is hosting a virtual panel discussion on how telecom operators can benefit from 5G networks.

Place: Virtual (online)

20 MAY

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31 - 2 MAY - JUNE

Telecom Review Leaders' Summit 2021

The 15th edition of the leading ICT gathering will be held in a hybrid mode where the latest industry trends will be tackled.

Place: Virtual and physical

8 DECEMBER

Latest updates on: www.telecomreview.com

Telecom Review's virtual panels' series continues in 2021

In light of the huge success achieved in 2020, *Telecom Review announces that the series of virtual panels will continue in 2021* with new and updated topics.

The 2020 series saw the participation of top notch speakers representing the industry's leading brands and registered a record number of online viewers.

The 2021 series is set to cover the topics of:

5G deployment, user growth

Capacity

Satellite, Content & Broadcasting

Cloud, Enterprise business

Digital Transformation

Cyber Security

Fiber, FTTH

For more information on sponsorships and participation, contact Mohamed Ershad: ershad@tracemedia.info

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