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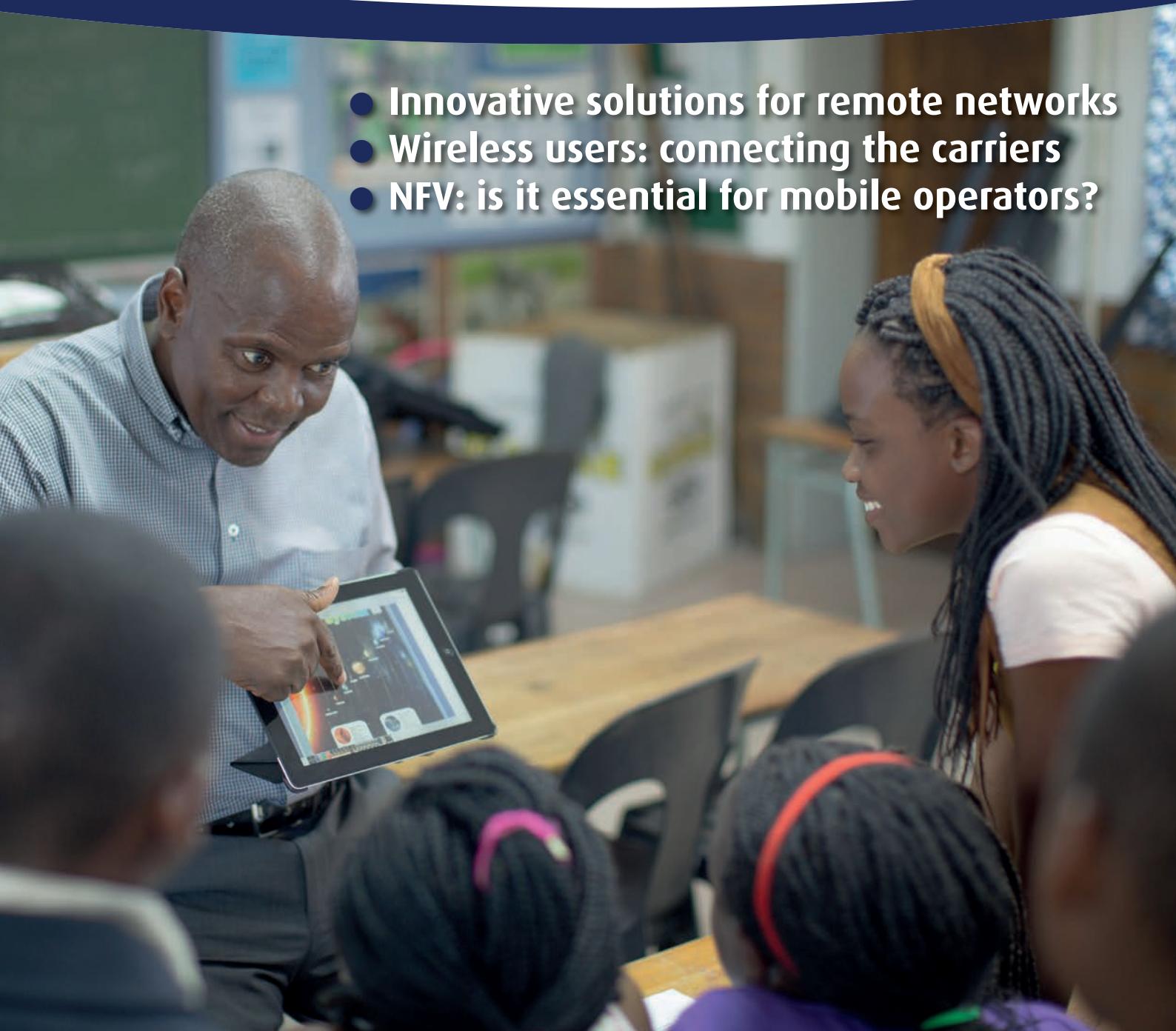
OCTOBER/NOVEMBER 2016

Volume 15

Number 5

COMMUNICATIONS

- Innovative solutions for remote networks
- Wireless users: connecting the carriers
- NFV: is it essential for mobile operators?



Enabling a Networked Society in Africa



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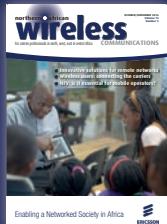
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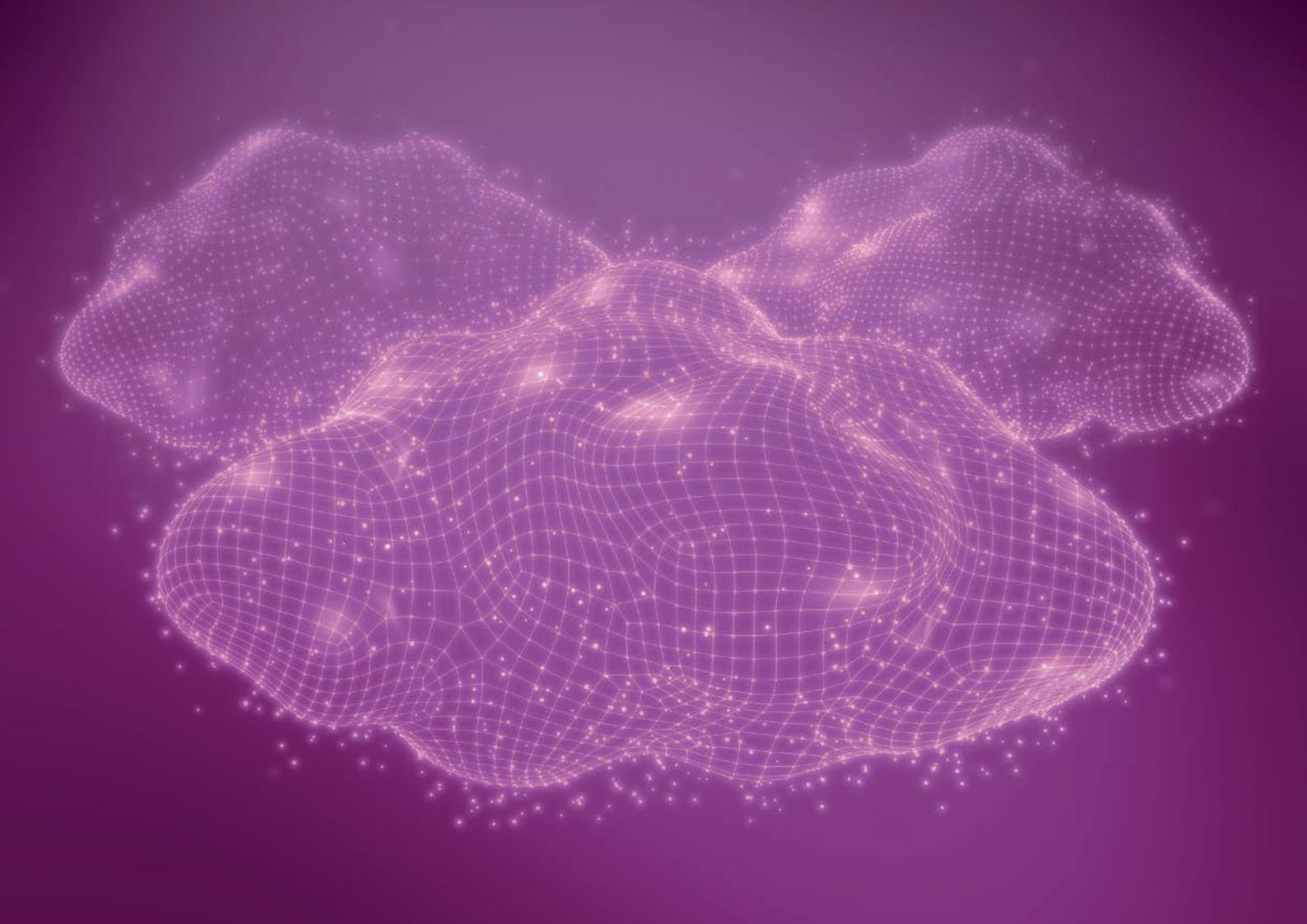
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 April 2016: Global Cloud Xchange expands reach across Europe through Sparkle SICILY HUB.

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Mobile broadband and smartphone adoption increase across MENA

There are currently 339 million unique mobile subscribers across the Middle East and North Africa, according to figures for Q216 revealed by the GSMA Association.

In its recently published *The Mobile Economy – Middle East and North Africa 2016* report, the GSMA predicts that unique mobile subscriptions (excluding M2M) will rise to 385 million by 2020.

The association's director general Mats Granryd said: "Operator investment in mobile technology is playing a crucial role across the Middle East and North Africa, helping to connect the unconnected in less



GSMA director general Mats Granryd said governments should provide citizens with affordable internet access.

developed markets and introducing innovative new services, such as the IoT and smart cities, in more developed countries."

The report also forecasts that mobile broadband networks will account for 61 per cent of mobile connections by 2020, up from 41 per cent today, across MENA's 25 markets (the GSMA defines these as: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, Turkey, UAE and Yemen).

Furthermore, the number of SIM cards registered for use in smartphones has also more than doubled over the last three years to reach 263 million in Q2 2016. The

GSMA said this accounts for 42 per cent of total connections and predicts it will reach 467 million by 2020.

While all the increases are good news, the organisation said it encourages governments to continue to invest in mobile infrastructure. Granryd said: "[They should] ensure that there is sufficient spectrum to meet demand as well as follow policies that encourage the adoption of mobile services. Governments should also provide citizens with affordable internet access that will help to drive economic growth."

GSM: bringing in billions for the region – Wireless Business, p13.

Kenyan authority says decision to license MVNOs is starting to "pay off"

The Communications Authority of Kenya (CA) says its decision to license MVNOs two years ago is beginning to pay off.

In its statistics for the last quarter of the 2015/2016 financial year (April-June 2016), the regulator reports a significant increase in mobile subscriptions and usage of voice minutes. It says mobile subscription grew by 9.9 per cent to 39.7 million while the penetration level hit 90 per cent, having grown by 6.1 percentage points.

"The number of mobile subscriptions continues to increase remarkably and this can be attributed to the market entry by MVNOs and expansion of mobile network infrastructure by the service providers," states the report.

In April 2014, CA granted MVNO licenses to Finserve Africa, a subsidiary of Kenya's Equity Bank, and two Kenyan mobile money transfer services, Tangaza Mobile Pay and Zioncell Kenya (see News, Apr-May 2014). Sema Mobile Services also gained a MVNO license during in the 2015/2016 financial year. The virtual operators use space capacity on Airtel's network in the country.

According to the authority, the

entry of the MVNOs has introduced a new range of innovative products and service propositions that gives more choice and value to Kenyans.

However, Safaricom continues to dominate the market with 25.9 million subscriptions. Airtel's total mobile subscriptions stood at 6.5 million, a decline of two per cent when compared to its 6.7 million recorded in the previous quarter. Orange Kenya grew to 5.2 million users, up from 4.8 million in the previous quarter. Meanwhile Finserve's MVNO Equitel recorded 2 million pre-paid subscribers while Sema registered 275.

■ In a separate development, the CA will issue 700MHz frequencies to MVNOs and tier-two infrastructure providers on a trial basis.

The authority's legal services director John Omo said: "We believe that the enhanced capacity to meet the growing demand for spectrum for mobile broadband services for 4G and for next-generation 5G networks is critical for the growth of ICTs."

Following WRC-15 last year, African countries agreed to allocate mobile operators digital dividend spectrum freed-up following a switch from analogue to digital TV.



Sales head Kamaldeen Shonibare – seen here with some of his colleagues – said Globacom is committed to giving citizens access to 4G wherever they are in Nigeria.

Globacom claims it's now the "grand master" of data following LTE launch

Globacom has now connected 17 cities throughout Nigeria to its LTE network that went live just a few weeks ago.

In early October, the operator claimed a first in the country with the launch of 4G services in nine cities that include Lagos, Port Harcourt, Abuja, amongst others.

Since then, it has added eight new locations to its *Glo 4* branded network: Okada (Igbinedion University); Ekpoma (Ambrose Alli University); Bonny, Escravos, Forcados, Abraka (Delta State University); Agbor (College of Education); and Sapele (Western Delta University).

Describing Globacom as the digital network for both the present and future generations, Kamaldeen Shonibare, head of corporate sales, said: "We're the next generation network, the grandmasters of data. That is why we have taken the lead in providing 4G LTE nationwide with mobility for Nigerians. We want them to experience the power of real time mobile broadband technology at the most affordable rates."

The operator is now offering various 4G data bundles including plans that give subscribers what it describes as a "whopping" 1.6GB of data for NGN500 (USD1.58) or 3.2GB for NGN1,000.

Ericsson and M-Pesa simplify water payments

Ericsson's M-Commerce Interconnect (EMI) service will be used to simplify mobile money payments and cash collection between Vodafone's *M-Pesa* system and businesses.

The first deployment under the deal will connect the mobile money platform with the growing network of Grundfos safe water kiosks throughout Tanzania and Kenya. Implementation in some of the other countries where *M-Pesa* is available is also expected to follow.

Grundfos' automated and connected kiosks (also known as water ATMs) dispense safe drinking water. But across rural Africa, 50,000 supply points have failed, mainly due to lack of funds and capacity for operations and maintenance.

Peter Todbjerg Hansen, MD of Grundfos Lifelink, says Ericsson and Vodafone have solved this challenge: "It is now possible to pay for water with mobile money, and water revenue collection is safe and automated."



Grundfos' automated and connected water kiosks – known as water ATMs – dispense safe, clean water (left) and accept payment via *M-Pesa* (above).

PHOTO: GRUNDFOS

Ericsson believes Grundfos' use of *M-Pesa* simplifies the payment process by taking cash out of the equation, and that the solution removes the need for water service providers to

integrate with every mobile wallet provider in a country. It says with EMI, any mobile wallet service from any service provider in any region can be used to provide payment.

Safaricom to compensate users for poor performance



Safaricom CEO Bob Collymore: "We are on a journey to build the best network for our customers."

Safaricom has updated its Network Guarantee service which refunds subscribers if they encounter call drops. The Kenyan operator says the revised service follows 90 days of gathering customer feedback.

Users will continue to be compensated for all of their dropped calls under the existing terms of service. However, under the new changes, refunds will now be provided cumulatively on a weekly basis.

Safaricom says customers will also benefit from a real time network

reporting tool that will allow them to instantly send a text to alert the company of any coverage issues.

The Network Guarantee service was introduced in June. Since then, Safaricom says the number of dropped calls on its network has registered at less than one per cent of total calls.

As part of its KES30bn investment this year, the firm intends to use dynamic feedback from its network, continuous customer feedback, and proactive network monitoring to dictate the roll out of new sites in areas

where services may not be optimal. At the same time, to eliminate the possibility of site interference, it says existing towers serving broad areas will be replaced with multiple sites closer to customers.

Safaricom adds that it has built more than 170 new BSTs over the last few months, many of them in areas where customers were experiencing call drops. This brings its total number of base stations to more than 4,000, with a population coverage exceeding 95 per cent.

EUTELSAT 5 West A to discontinue African C-band services

Eutelsat is planning a new satellite for the key 5°W orbital position. It has contracted Airbus Defence and Space to build the payload while the platform will be manufactured by Orbital ATK.

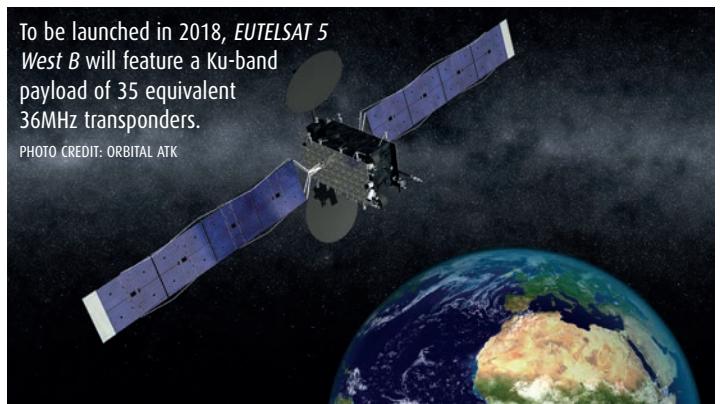
To be launched in 2018, *EUTELSAT 5 West B* will replace *EUTELSAT 5 West A* which predominantly targets the French, Italian and Algerian broadcast markets. *EUTELSAT 5 West A*'s C-band mission, serving mainly data customers in sub-Saharan Africa, will be discontinued. The company says service continuity will be provided by similar C-band capacity available on its other resources, thereby optimising capacity utilisation rate across the group's fleet.

Eutelsat reckon the new satellite will provide business continuity and improved quality via a Ku-band payload of 35 equivalent 36MHz transponders connected to three service areas. Switchable transponders will also increase commercial flexibility.

As the first satellite to be procured within the company's capex reduction strategy framework announced in June, *5 West B* will be developed using the principle of 'design-to-cost'. Through an improved match of the spacecraft's coverage with specific customer requirements at 5°W, Eutelsat claims savings will be achieved in power requirements and hardware,

To be launched in 2018, *EUTELSAT 5 West B* will feature a Ku-band payload of 35 equivalent 36MHz transponders.

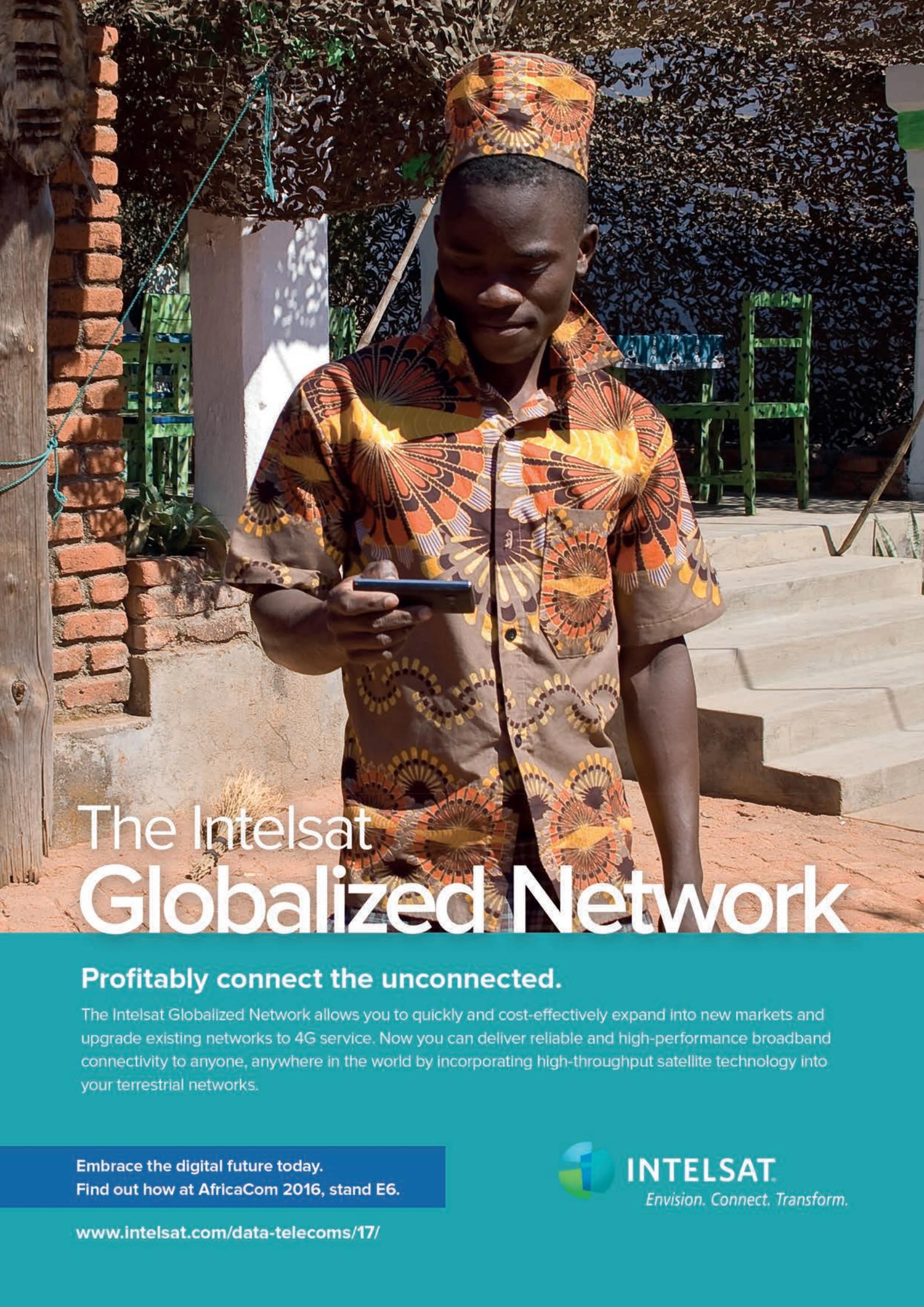
PHOTO CREDIT: ORBITAL ATK



while maintaining the "highest" standards in terms of performance.

It adds that the reduction in the satellite's size enables a shared launch by an International Launch

Services Proton vehicle in a stacked configuration with *MEV-1*, the first mission extension vehicle developed by Orbital, thereby reducing launch costs, including insurance.

A young man in traditional African clothing, wearing a vibrant yellow and orange patterned shirt and a matching headwrap, stands outdoors. He is looking down at a tablet device he is holding in his hands. The background shows a brick wall, some green chairs, and a thatched roof structure, suggesting a rural or semi-rural setting.

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Mobile networks expand in Algeria

Mobile operators in Algeria have been busy growing their networks over the last few months.

In early October, VimpelCom and Global Telecom Holding announced that their subsidiary Djazzy had launched LTE services in the country. They claimed Djazzy's 16 million subscribers would benefit from the largest coverage across Algeria as well as the fastest mobile digital service.

"Djazzy's 4G/LTE roll out is not simply an evolution, it's a revolution for Algeria and will change the way we interact with our customers through the digital world," claimed

Djazzy CEO Tom Gutjahr.

As well as introducing LTE, Djazzy has also extended its 3G network to seven 'wilayas' or administrative districts. They include: Tipaza, Biskra, Laghouat, Sidi Bel Abbes, Oum El Bouaghi, Tebessa and El Tarf.

With this latest extension, the operator says it now covers 41 wilayas. It adds that it remains committed to full 3G coverage of 48 provinces by December.

Meanwhile, rival operator Ooredoo Algeria has successfully completed its pre-launch phase for 4G and has now started to introduce



Algérie Télécom was actually the first operator to deploy LTE in North Africa two years ago.

services. The launch took place earlier this year in Tlemcen, north-western Algeria. It is one of three

provinces, along with Tizi Ouzou and Bechar, that now offer 4G. Since then, Ooredoo has been rolling out its network across all 48 provinces in the country. It used a preliminary license from the local regulator to carry out its initial trials which were conducted with Nokia.

Despite Ooredoo's claim that it was Algeria's first MNO to launch LTE, incumbent operator Algérie Télécom actually rolled out 4G in 2014. Not only was it the first operator to launch the technology in the country but also the first in North Africa (see News, Jun-Jul 2014).

Satcom remains essential part of Africa's connectivity

Satellite-based solutions should not be bound to last-mile or rural environments, says the Global VSAT Forum (GVF). During the inaugural *Future-Sat Africa Summit* recently held in Ethiopia, delegates heard how satcoms should be part of the overall landscape of the telecoms offering for all type of users and all locations.

Speaking at the two-day summit in October, GVF correspondent for Europe Julián Seséa called upon the satcoms industry to cooperate with their future users to ensure "close and mutual trust" in highly evolving scenarios due to technology trends and new business routes.

He said: "African countries have developed their national plans

towards enhancing the penetration of telecommunication services, broadcast and broadband. The satcom industry should contribute to ensure that the value of the satellite component is fully appreciated when designing and implementing the national plans."

According to the GVF, satellite offers a crucial and core element of the connectivity solution needed to meet Africa's application needs.

But the forum warned that for many countries, the big challenges lie with policies and regulations that do not adapt and evolve as fast as the technology they relate to. It said that Africa's networks need to make use of all available technologies, fully integrated and operating seamlessly.

GIN launches *Satmotion* auto-provisioning VSAT service



It's claimed *Satmotion* enables installers to point and adjust antennas and streamline the overall commissioning of VSAT solutions.

Gondwana International Networks (GIN) says it will enhance the delivery, commissioning and maintenance of VSAT services, while also minimising opex, time and interferences.

The pan-African communications service provider has launched the *Satmotion* auto-commissioning tool from network monitoring systems specialist Integrasis.

GIN claims to be one of the continent's largest VSAT operators through its *AfricaOnline* and *iWayAfrica* brands. Guy Schalker, the company's CTO, says the *Satmotion* rollout will empower installers to

autonomously point and adjust users' antennas and streamline the overall commissioning of VSAT solutions.

"By simply installing an app on a smartphone, whether Apple or *Android*, the VSAT installation capabilities are simplified making installation easy regardless of the installers' level of experience. This not only reduces the installation time and associated costs, but more importantly means the customer is installed accurately first time with optimised polarisation."

Schalker says the big benefit for GIN is not only providing customers with

operator to have introduced 100Gbps technology between Europe, the Middle East, and Africa in 2015. Its chairman and CEO, Alessandro Talotta, adds that the upgrade proves the vital role of Sicily as the "natural and most efficient" European hub for the three regions.

Founded in 2008, LITC is a subsidiary of the Libyan Post, Telecommunications and Information Technology Holding Company. As well as being Libya's main international voice and data wholesale provider, LITC aims to meet the country's high growth in the business environment, and to satisfy increasing demand for international voice and data services.

Africa's first auto-provisioning VSAT solution, but also one that ensures the installation is right first time.

"Our customers will have guaranteed cross-polarisation that will mitigate XPOL interference, as well as the provision of valuable QA data and limited requirements for site returns."

Satmotion is described as a "scalable solution that delivers optimal line-up with minimum interference".

Schalker adds that GIN is introducing the tool together with Hughes Network Systems' *JUPITER* platform to ensure the customer experience is "enhanced".

RCS bucks trend in South Sudan

South Sudanese ISP RCS-Communication plans to double its bandwidth capacity over the next two years, despite most service providers in the country scaling down operations due to economic and other challenges.

"While RCS is not isolated from these issues and their impact, our investment decision was taken with a long term view," says RCS MD

Flippie Odendal. "Demand for bandwidth continues to rise as the use of cloud-based applications increases and a significant number of our enterprise clients are implementing ERP and other systems to improve their efficiencies."

The ISP will use additional satellite capacity from O3b as it is said to have now almost exhausted

its contracted capacity as demand for bandwidth continues to increase. RCS was one of the first companies in Africa to sign up with the MEO satellite operator in 2013, and uses *O3bTrunk* to connect its WiMAX and high throughput point-to-multipoint networks in Juba to the internet.

With the upgrade, it will be the first customer to implement the site

Diversity system, the first of O3b's solutions to leverage its SDN platform for intelligent switching across multiple satellite links. With *Diversity*, ground terminals are placed in multiple locations, yielding what O3b claims is the "highest possible network reliability and resiliency, setting RCS apart for mission-critical corporate and government applications".

TT tests ADTRAN G.fast system

Tunisie Telecom (TT) has successfully completed a series of tests of G.fast access technology with ADTRAN.

G.fast stands for 'fast access to subscriber terminals' and is standardised as part of the ITU-T G series of recommendations (hence the letter 'G'). It is a DSL protocol and aims to deliver between 150Mbps and 1Gbps over local loops shorter than 500 metres.

However, using ADTRAN's 500G series testing equipment, it's claimed TT's G.fast experiments saw high-speed services reaching more than 800Mbps at a distance of about 100m on an existing copper infrastructure. The solution was also integrated in all-IP network with an automated SDN and NFV.

The tests marked the first time TT adopted a DevOps approach for the deployment of new services. ADTRAN adds that they were conducted in the summer when temperatures go up to 50°C inside cabinets and distribution points.

"The results of these tests have been very positive to the extent that they allowed us to explore several paths for future development of our broadband access network," says TT CEO Nizar Bouguila: "They demonstrate how G.fast technology can be used to enhance our existing infrastructure and satisfy increased demand for bandwidth with better agility and a shorter deployment time."

The advertisement features a blue-toned map of Africa with binary code (0s and 1s) overlaid. At the top right is the RSCC logo and the text "Russian Satellite Communications Company". Below the logo, it says "Visit us at AfricaCom November 15–17, stand A1". The page is filled with various images: a man in a suit looking at a smartphone, a white van parked near a satellite dish, a woman sitting cross-legged using a tablet, a group of people in a meeting room, and two children looking at a computer screen. The bottom left corner contains the website address "www.rssc.ru".

Ghana subscribers

 Ghana now has 36,912,019 mobile subscribers, according to official figures for the end of August released by the National Communications Authority. That represents a penetration rate of 132.44 per cent. Scancor (MTN) remains market leader with a 48.7 per cent share and 17.89 million voice subscribers. It was followed by Vodafone with 8.22 million users, Tigo with 5.22 million and Airtel with 4.64 million. Glo's voice subscribers decreased from 854,912 in July to 822,539 in August, while Expresso trailed at 106,975.

Illegal SIM arrests

 In mid-October, a Nigeria Communications Commission (NCC) operation unit backed by security forces reportedly arrested six men in Kano for being in possession of hundreds of pre-registered SIM cards. They were arrested in two separate raids in the GSM village located at the farm centre and the Yankura market in the metropolis. Selling pre-registered SIMs is a criminal offence in Nigeria, and the NCC said it would continue to raid markets across the country in order to stamp out the problem.

New ATU members

 The African Telecommunications Union (ATU) has welcomed two new associate members. They include Germany-headquartered radio monitoring and spectrum management consultant LS telcom. Its MD Jean-Paul Chaib said: "As the leading provider of solutions to regulators, it is a natural step for LS telcom to join the ATU." The second new member is satellite operator Iridium. It will help the ATU prepare for ITU assemblies such as WRC 19, as well as satellite policies and other relevant matters.

"State-of-the-art" satellite installer course in Senegal

A new satellite installer course at the Ecole Supérieure Multinationale des Télécommunications (ESMT) in Senegal has now become a fixed part of the curriculum.

Since being established 30 years ago, Dakar-based ESMT is regarded as a leading ICT university in sub-Saharan Africa. Its launch of the course is one of the key areas of collaboration specified in an MoU that was recently signed with SES to bring advanced VSAT and DTH satellite installer training skills in Senegal.

SES says the programme will mean more installers will be equipped to support satellite and digital television migration in Senegal. At the end of each course, installers are given a certificate which is said to provide the opportunities to generate more income

and further develop skills, learn cutting edge techniques, and improve the overall quality of installations.

"This will empower our youth to become entrepreneurs and start their own businesses, and in the process create employment opportunities for others," says EMST DG Tahirou Ouattara. "Our institution provides certifications and graduate programmes within the telecoms industry, and this partnership with SES will enable us to expand our current programme offerings."

As part of the ELEVATE training programme, SES has sponsored a classroom that will be re-branded, furnished with the necessary equipment, and become the dedicated training venue. SES has also created an internet hub for ESMT and



ESMT is regarded as a leading ICT university in sub-Saharan Africa. Since 2012, it has worked with SES to train more than 8,000 satellite installers across the continent.

will provide it with free internet connectivity for a year via its ASTRA 2G satellite.

Shunt fault impacts SEACOM's traffic

On 17 October, SEACOM announced that it had identified a 'shunt fault' in the Mediterranean Sea between Egypt and France.

A shunt fault occurs when a submarine fibre cable's insulation becomes damaged, creating a short circuit when seawater comes into direct contact with the metallic core. SEACOM said all transmission

traffic on the East Coast of Africa to and from Europe was affected as a result of the incident.

The operator said that while customers with IP services remained unaffected, they could experience higher latencies with possible degradation of service, as traffic was predominantly re-routed via WACS and SEACOM's network to the Asia gateways.

At the time of writing, SEACOM had mobilised a vessel that was due to reach the fault location by around 19 October. It said repair work would affect services and was scheduled until 28 October. However, due to the nature of the activity, which largely depends on weather and other sea conditions, the firm added that the planned work window may vary.

West Africa's only Tier III DC is kitted out

MDXi, the only the only Tier III certified data centre in West Africa, will use a cold aisle containment (CAC) system supplied by Minkels.

The Netherlands-based data centre infrastructure specialist (which is part of publicly traded company Legrand) was selected by MDXi following a worldwide search to find best of breed solutions to accommodate the various needs of its global customers with racks of varying widths and heights.

Based in Lekki, Nigeria, the MDXi data centre was launched in January 2015. It is owned and operated by MainOne which deployed an open access submarine cable down the coast of West Africa in 2010. Since



CEO Funke Opeke says demand rapidly outstripped the colocation space in MainOne's landing station.

then, the company says the region has experienced booming ICT usage by businesses and government institutions. Furthermore, its says these customers are being empowered to colocate their data and servers in remote locations based on improved terrestrial fibre connectivity.

MainOne CEO Funke Opeke says: "The market demand rapidly

outstripped the colocation space in our landing station and necessitated the construction of a purpose built Tier III facility with 600 rack capacity. We developed MDXi over 24 months to keep up with customer demand."

The company says all top industry players, custom CAC vendors, and local manufacturers were evaluated to provide racks, cold aisle containment, PDUs and accessories for customers at the data centre.

Opeke says Minkels met the requirements for a CAC solution that needed to be flexible in terms of rack width and height, able to accommodate a free standing 47U solution, and lend itself to caging.

Operators sign up for 4G in Egypt

All three mobile operators in Egypt have now accepted licenses to run LTE services in the country.

Following months of pre-sale discussions, the National Telecom Regulatory Authority's (NTRA) deadline for the sale of the licenses ended on 22 September. But only new mobile entrant, fixed line incumbent Telecom Egypt, accepted a license for a fee of EGP7.08bn (USD797m). In the words of the NTRA, the country's three other cellcos – Vodafone, Orange and Etisalat – "shunned" the opportunity to acquire licenses.

As reported previously, Vodafone did not bid as it believed the license did not offer sufficient spectrum to operate 4G services efficiently (*see News, Aug-Sep 2016*). Orange Egypt supported this view. In an online press statement, the operators said that while it remained interested in 4G and investing in the country, the quantity of spectrum offered was not enough to offer customers 4G services at the "required level of quality according to all international standards". Even NTRA president Mustafa Abdul Wahid reportedly agreed that the amount of spectrum on offer was "not enough" for Egypt's 90 million users.

In September, after the 4G sale failed to attract any bids from the three mobile operators, the GSMA called for renewed dialogue between the authorities and the country's mobile industry. Based on its own international experience, the GSMA said the total amount of spectrum assigned to each operator for 4G needs to be in the range of 2 x 30MHz to 2 x 60MHz. It added that this needs to be across a range of coverage and capacity bands, with a minimum contiguous bandwidth of 2 x 10MHz in each band to enable efficient network economics.

As a result of the rejections, the NTRA withdrew its original offer and considered alternatives, including offering the licenses in an international auction. But following restarted talks with local operators in early October, the regulator revised its terms.

On 14 October, Orange became the first MNO to accept a 4G license. It was given 2 x 10MHz of spectrum for USD484m. The operator said this will enable it to offer the "excellent quality of 4G service that Egyptian

customers deserve, and complies with international standards". It immediately invited subscribers with compatible handsets to get their free 4G SIMs in readiness for the launch of services, a date for which was promised "soon".

Just days later, the NTRA announced that Etisalat had also signed up for a license for

USD535.5m. It also paid USD11.3m for the operation of a virtual fixed-line service as part of the deal. Accordingly, Etisalat Misr has total frequencies of 40MHz, including 2 x 10MHz for LTE.

Vodafone Egypt also ended up signing an agreement with the regulator to acquire a 4G as well as a virtual fixed license.

But according to *Daily News Egypt*, the celco will now only be given 5MHz of LTE-suitable frequencies, down from the 7.5MHz it had been offered under the earlier licensing terms that it had rejected. As a result, *TeleGeography* points out that Vodafone Egypt will now pay USD67m per megahertz – an increase of USD13.9m per megahertz.

Connecting the Unconnected, a Priority for Ericsson in sub-Saharan Africa

The Sustainable Development Goals cannot be achieved without affordable and universal access to Information and Communications Technologies (ICTs) and broadband connectivity. This was the finding of members of the Broadband Commission who met on the eve of the opening of the 71st session of the UN General Assembly.

As at December 2015, only 20 percent of the sub-Saharan African population had access to the internet. A recent report by the UN Broadband Commission for Sustainable Development states that globally, approximately 3.9 billion people are not using the Internet. The report estimates that China, India, Indonesia, Pakistan, Bangladesh and Nigeria account for 55% of all unconnected people. These findings suggest that targeted efforts in just a few key markets could help significantly in redressing the gaping 'digital divide' between those who are online and those still offline.

Ericsson understands the challenge and opportunity
To drive global ICT expansion, there is a need to set ambitious and achievable targets. The International Telecommunication Union's (ITU) Connect 2020 agenda states that by 2020, more than 50% of the individuals in the developing world shall use the internet. Considering that a huge part of the world's population lives in this region, this poses an enormous challenge, but also an opportunity. To meet the Connect 2020 requirements we will need to provide internet to more than 700 Million new subscribers between now and 2020. This is equivalent to connecting 500 thousand new users to the internet each day by Mobile Broadband.

The challenge is that the Average Revenue Per Unit (ARPU) is rather low for many of these 700 Million users. It can vary between 1 and 10 USD depending on region and country, and this sets new requirements on what a cost efficient mobile broadband solution is. Nevertheless, role players in this industry must find the solutions to capture the opportunity for growing with 700 Million new subscribers.

Ericsson has invested in providing solutions that can make a difference

Ericsson recently announced a set of solutions to help bridge the digital divide and bring mobile broadband coverage to the remaining three billion people who are underserved or without mobile broadband access.



The new suite of solutions, which includes software and hardware additions to Ericsson Radio System, provide the capabilities needed to reduce the total cost of ownership by up to 40 percent when rolling out Ericsson's total site solution for mobile broadband, making investments in low-ARPU markets viable.

To complement deployment of the solutions, are new unique mobile broadband tools, which allow operators to identify which sites in a GSM/EDGE coverage area have the highest number of users who already have internet-ready devices. Operators can then determine where it makes more sense to convert those sites first to HSPA or 4G/LTE, so that the greatest number of people will enjoy the benefits of mobile broadband.

The new solutions address the significant divide in internet adoption between developed and developing countries – only four out of ten people in developing countries are connected to the internet. These solutions are also energy-efficient taking into consideration a significant challenge in some developing markets. As at 2015, GSM/EDGE still accounted for close to 70 percent of the total mobile subscriptions in sub-Saharan Africa. These energy-efficient suites of solutions will enable operators to seamlessly identify underserved communities in the region, making it faster to introduce or improve the mobile broadband experience of their subscribers. This will open new opportunities in far flung areas in the region, creating access to new services such as mobile money, e-health, e-education and e-government, thereby transforming the way people play, learn and do business forever.

In summary, with these solutions, operators can improve user experience by up to 20x by upgrading the GSM networks and let the performance drive data consumption. Our solutions also provide the methods and tools to find the sweet spots and place the investment

where it makes difference to the largest groups of users which enable accelerated deployment pace due to faster return on investment. Finally, these solutions reduce Total Cost of Ownership (TCO) by up to 40 percent when rolling out Ericsson's total site solution for mobile broadband. These are substantial additions to the company's mobile broadband coverage product portfolio targeted at securing the next 700 Million MBB users by 2020.

The role of partnerships

A recent report by Ericsson and the Earth Institute at Columbia University on the impact of ICT on sustainable development calls on governments to harness technology, investment, and new types of partnerships to meet the goals.

The report indicates that even though ICT has a direct impact on meeting the goals by 2030, three supporting aspects must align before ICT can deliver transformational change at the pace and scale required – an enabling policy framework, strong Public-Private Partnerships (PPPs), and sufficient public and private investment.

As per the ITU's 2020 agenda, Ericsson will continue to innovate and develop technology to move this agenda forward as well engage relevant stakeholders to support the deployment of ICT ensuring that the dividends are being enjoyed across the region.

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GSM bringing billions into region

In 2015, the mobile industry contributed more than USD150bn to the Middle East and North Africa region's economy, according to the GSM Association.

The *Mobile Economy – Middle East and North Africa 2016* report published in mid-October revealed that the adoption of mobile broadband and smartphones is on the rise across MENA (see *News*, p5). It also found that the mobile industry contributed four per cent of the region's GDP and forecasts that this will grow to almost USD200bn by 2020.

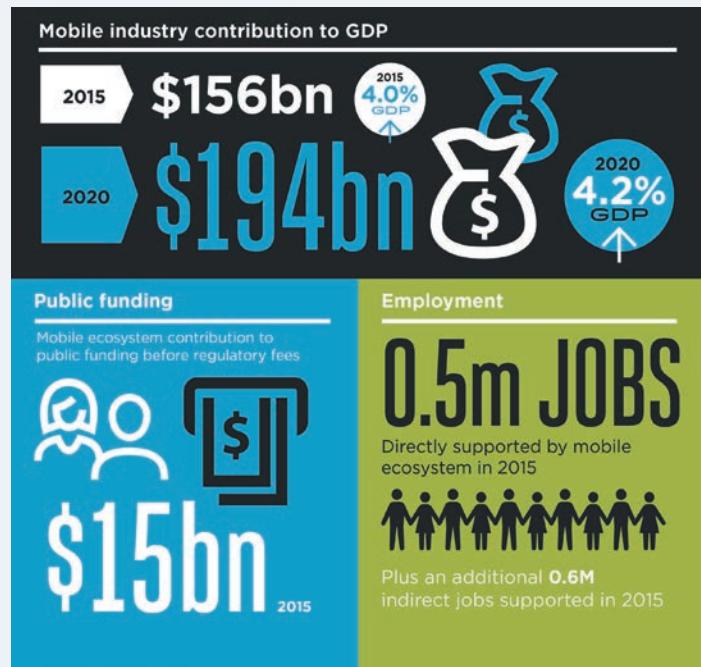
The GSMA said the mobile industry also supported the local economy with more than one million jobs in 2015. This includes workers directly employed in the ecosystem and jobs indirectly supported by the economic activity generated by the sector. It added that the industry contributed USD15bn last year to public funding in the form of general taxation.

Among the 25 countries included in MENA (see p5), the association revealed "huge" variances in the levels of market maturity between Gulf states and African countries.

For instance, it said in Bahrain, Kuwait and the UAE, 77 per cent of the population have a mobile subscription, while in some African-Arab markets, such as Comoros, Djibouti and Somalia, subscriber penetration is less than 30 per cent.

The report highlights that subscriber rates will slow over the next few years, due to the more advanced markets approaching saturation and less developed markets suffering from unstable political and economic conditions.

Furthermore, the GSMA said penetration across the region is set to reach only 63 per cent of the population by 2020, below the global average of 73 per cent.



SOURCE: THE MOBILE ECONOMY - MIDDLE EAST AND NORTH AFRICA 2016; GSMA

Safaricom funds m-learning startup

Safaricom is investing in Kenyan startup Eneza Education through its USD1m Spark Venture Fund.

Founded in 2012, Eneza Education provides mobile-based education tools for primary students, and is said to have so far reached more than a million learners in Kenya.

"We believe in the power of the mobile phone in extending access to learners so they can realise their full potential," says company CEO and co-founder Kago Kagichiri. "The additional investment will go a long way in enabling us reach more learners in countries where we already operate in, and in expanding to more countries."

The Safaricom Spark Venture Fund invests in startups by purchasing minority equity stake or providing convertible debt, allowing young businesses to access the finances coupled with the technical advisory and business development services needed to grow their businesses.

Eneza Education is currently broadening its presence to other countries, including Tanzania, Rwanda, Ghana, Zambia, South Africa, Liberia, Malawi, Nigeria and Benin.

In its first partnership with Safaricom four years ago, the firm developed an SMS-based exam revision and learning app. *Shupavu*

291 is designed to offer a personalised experience by providing real-time course level progress, interactive lessons and assessments, all via even the most basic mobile handsets.

Users can also access locally designed tutorials, as well as chat live with a teacher either through USSD, SMS, or a desktop or *Android* app. Over the last four years, it's claimed 90 million messages have been sent on the *Shupavu 291* platform, with more than 14 million questions completed by learners.

Recently, Safaricom announced its second Spark fund investment. *mSurvey* is a mobile-first research platform leveraging SMS and mobile messaging technology to simplify access to credible, on-demand data from the emerging world.

SpeedCast expands pan-African coverage

SpeedCast International has finalised a joint venture in Ghana as part of its commitment to provide a managed network throughout the continent.

The company has not named the firm it is working with in the country but describes it as a local partner with an "already extensive" presence in the oil and gas sector.

This latest alliance builds upon SpeedCast's existing activities in

Algeria, Libya, Nigeria, Kenya and Angola. The company claims the move places it in a "prime strategic position" to meet Africa's growing need for high quality communication services over fibre, wireless and satellite.

Bill Green, MD of SpeedCast Ghana, adds: "An important part of SpeedCast's energy strategy is to anticipate oil field trends and proactively build support networks in these countries to ensure we're providing our customers with world-class service and support."

Green reckons SpeedCast is now "well equipped" to expand into Ghana whilst satisfying local content laws and enabling knowledge and technology transfer to Ghanaians.

Profits warning for Ericsson

Ericsson's woes continue as it announced its preliminary Q316 earnings and issued a profits warning.

In October, the company said business result for the quarter will be "significantly lower" than expectations. "Negative industry trends from first half 2016, with weaker demand for mobile broadband, especially in markets with weak macro-economic environment, have further accelerated," stated the vendor.

Sales fell by 14 per cent YoY to SEK51.1bn (SEK59.2bn for Q315),

driven by slower development in Ericsson's Segment Networks division where sales plummeted by 19 per cent. Ericsson said the decline was mainly driven by markets such as Brazil, Russia and the Middle East, impacting both coverage and capacity sales in those markets. In addition, it said capacity sales in Europe were lower following completion of mobile broadband projects in 2015.

The company's operating income dropped to SEK0.3bn (SEK5.1bn for Q315), including restructuring charges of SEK1.3bn.

"Our result is significantly lower than we expected, with a particularly weak end of the quarter, and deviates from what we previously have communicated regarding market development," says president and CEO Jan Frykhammar.

"Continued progress in our cost reduction programs did not offset the lower sales and gross margin. More in-depth analysis remains to be done but current trends are expected to continue short-term. We will continue to drive the ongoing cost program and implement further reductions in cost of sales to meet the lower sales volumes."

Frykhammar was appointed CEO following the immediate departure of Hans Vestberg earlier this year (see *Wireless Business*, Aug-Sep 2016).

Earlier in October, Ericsson announced job losses for around 3,000 employees in Sweden as part of its 2106 restructuring target of SEK4-5bn. The company employs around 16,000 people in its home country, and proposed cutbacks will see redundancies

of approximately 1,000 positions in production, 800 in R&D, and 1,200 in other operations such as sales and admin. Ericsson added that the lay-offs will be a combination of voluntary and "forced reductions", as well as other measures such as outsourcing

Rising economies help to drive growth in cellular IoT connections
 APAC, headed-up by China, along with Brazil and Russia are now driving the market for M2M and IoT connections, according to Beecham Research.

In its recently published Global Assessment of the Cellular IoT Connectivity Market report, it says that cellular IoT connections – from 2G to 5G – reached almost 261 million at the end of 2015 and predicts they will approach 1.22 billion in 2021.

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
22/7/16	Abderrahmane Semma	Maroc Telecom	Co-opted to supervisory board	Ministry of Economy & Finance	Director of public companies & privatisation (retains position)
22/7/16	Hatem Dowidar	Maroc Telecom	Co-opted to supervisory board	Etisalat International	CEO (retains position)
1/9/16	Ahmed Essam	Vodafone International	CEO European cluster	Vodafone Egypt	CEO Vodafone's European cluster includes Ireland, Portugal, Greece, Romania, Czech Republic, Hungary, Albania & Malta.
29/9/16	Paul Brown-Kenyon	–	–	MEASAT	Stepped down as CEO. Simon Cathcart appointed interim CEO.
4/10/16	Zunaid Bulbulia	Kirusa	Member of advisory board	–	Bulbulia was one of the founding members of the MTN Group. He is currently non-executive director of Johannesburg-based Huge Group.
24/10/16	David Barrass	Sepura	Interim CEO	Various	Various advisory & executive roles. Takes over from Gordon Watling as CEO who has taken an extended period of absence following medical advice.
24/10/16	Alan Lovell	Sepura	Chairman	Various	Various advisory & executive roles
24/10/16	Jason Smith	Inmarsat	COO	Rolls-Royce	President of nuclear business
26/10/16	Börje Ekholm	Ericsson	President & CEO	Patricia Industries	CEO. Will join Ericsson on 16 January 2017.

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
18/10/16	ADTRAN	US	3Q16	USD	168.89	155.21	0.26	Revenue performance for quarter exceeded expectations with total income increasing 7% YoY. CEO Tom Stanton: "I am particularly pleased to see our international business grow 42% over the previous quarter."
24/10/16	Maroc Telecom	Morocco	3Q16	MAD	26,674	12,934	NA	Earnings for mobile services & equipment amounted to MAD10,717 – down 1.5% compared to MAD10,876 in 3Q15. Mobile subscribers reached 18.6m, up 0.3% YoY, driven by 6.9% growth in post-paid customers; pre-paid dropped 0.3%.
25/10/16	Bharti Airtel	India	2Q16	INR	24,652 (crore)	9,466 (crore)		Overall revenues up including Africa which reported 3.7% growth YoY on underlying basis (adjusted for divested operating units in Burkina Faso & Sierra Leone, & tower sales).
25/10/16	Millicom	Luxembourg	3Q16	USD	1.6 (bn)	562	NA	Africa businesses delivered 11.2% organic service revenue growth with an EBITDA margin of 28.5%. Overall organic service revenue down 0.2% YoY.
25/10/16	Orange	France	3Q16	EUR	10.3 (bn)	3.6 (bn)		YoY earnings in MEA increased 2.5% to reach EUR1,371m. At the end of September, company had 113.5m mobile customers in the region, including Tigo DRC (3.4m) & Cellcom in Liberia (1.5m), both of which were consolidated in the quarter.
27/10/16	Nokia	Finland	3Q16	EUR	5.95 (bn)	432	-0.02	Net sales for Networks business saw 12% YoY decrease. In MEA, the division's net sales amounted to EUR469M – a 14% rise from 2Q but a 7% decline YoY. The region currently accounts for 9 per cent of net sales for the Networks division.
27/10/16	Intelsat	US	3Q16	USD	542.7	396	NA	Earnings declined 7% YoY. Firm says "headwinds" continue to dominate its results, including pricing pressure: "[This reflects] oversupply conditions of wide-beam capacity for certain regions & applications, point-to-point telecoms infrastructure services moving to fibre alternatives, & limited new US government opportunities."

The study also points to strong growth in the Arab states and sub-Saharan Africa, but for different reasons. While Israel and the Arab states are developing smart city, energy and environmental IoT applications, it says the focus in Africa is on remote payments as well as healthcare, water systems and agriculture. The IoT vision is also starting to take shape in countries such as India, Indonesia and Vietnam due to government initiatives across urban and rural areas.

"The speed of adoption of cellular IoT connections is increasingly diverse among regions and even among countries in the same region," says report author and Beecham Research principal analyst Saverio Romeo.

"This is due to different stages of development, but also different regulatory regimes, government policies, cultures and the dynamics of regional and national economies."

While the report shows that the US market is now the second largest after China, it continues to grow with major interest in areas such as smart homes along with the industrial IoT.

In Western Europe, Beecham says projects such as smart metering are driving the market in countries such as the UK and Netherlands, while attention on other forms of connectivity such as LPWANs (Low Power Wide Area Networks) is also having an impact.

The study points out that connectivity remains an important part of the IoT market and says that it is becoming evident that no one size fits all.

Rome says: "Low-data IoT will be increasingly dominated by LPWAN solutions that will contribute to the erosion of 2G IoT connections, while operators will push the move towards 3G, 4G and eventually 5G for more data intensive applications. But we will also see multiple connectivity types used for the same application where they complement each other."

MTN launches new billion rand BEE transaction

The MTN Group will implement a new ZAR9.9bn Broad-Based Black Economic Empowerment (BEE) transaction when its existing special purpose investment vehicle, MTN Zakhele, contractually unwinds.

It's claimed Zakhele has created "exceptional value" for its 124,000 black investors. Notwithstanding an extremely difficult nine months, the company said shares had almost



The latest *MOTOTRBO* digital radios use Wi-Fi for software updates, thus saving what Motorola says is "hundreds of hours of lost productivity".

quadrupled from ZAR20 per share at inception in 2010, to around ZAR77 per share in mid-August 2016. MTN pointed out that this equates to a total return of about 400 per cent and a CAGR of around 26 per cent.

The operator added that the mandatory unwinding of Zakhele on 24 November 2016, combined with the creation of the new Zakhele Futhi scheme, will see MTN not only maintain its BEE targets as set out in the Information and Communication Technology Sector Code (the ICT Charter), but also adhere to the B-BBEE Act, allowing the firm to further "embed empowerment and transformation in the DNA of its business".

Zakhele Futhi will hold approximately four per cent equity in the MTN Group and exist for an eight-year period. Its launch in September took the form of a public offering where qualifying black participants were invited to subscribe for ordinary shares with a minimum investment amount of ZAR2,000.

Shares were issued at ZAR102.80, a 20 per cent discount to the 10-day volume weighted average price per MTN share on 17 August 2016 of ZAR128.50. Shareholders also have the opportunity to re-invest a portion of their Zakhele shares in Zakhele Futhi.

MTN Group executive chairman Phuthuma Nhleko says: "This new transaction, together with the continuing contribution of the MTN Zakhele transaction, will translate to an effective indirect 'see-through' black ownership in excess of 30 per cent of MTN's South African operations."

In addition to the BEE scheme, MTN's board has proposed the introduction of a new employee share ownership plan which will not require equity from eligible participants. The company will issue approximately 0.1

productivity, efficiency and worker safety. Among the new products now available from the vendor's partners in Kenya are its latest *MOTOTRBO* digital radios. These use Wi-Fi connectivity for software updates and it's claimed this can save hundreds of hours of lost productivity.

"For a group of 350 workers, updating devices can mean 400 lost hours," claims the firm. "*MOTOTRBO* radios update seamlessly without the need to drop off devices, and coupled with 29 hours of battery life, the new line keeps workers in the field or on the job instead of waiting for new software."

The vendor has also launched its *WAVE Work Group Communications* system in Kenya. This is described as a broadband PTT solution that delivers real-time voice and data securely over any network, using any device.

Utilising their existing two-way radios, smartphones, laptops landlines, tablets, etc., Motorola Solutions says *WAVE* enables users to connect to the networks that they already subscribe to, and communicate via PTT with others both inside and outside of their communication system.



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APPLICATIONS

- Connecting remote locations to operator POPs
- Reliable connectivity in adverse climatic conditions
- Safe to deploy in hazardous locations
- Off-shore wireless links

Pioneering solution claims to cut PIM in cell networks

Hughes Electronics has developed what it describes as a "pioneering" new connection system to help

MANUFACTURER:
Hughes Electronics

PRODUCT: WaveWay

MORE INFORMATION:
www.hugheselectronics.co.uk

reduce passive intermodulation (PIM) in cellular networks.

WaveWay is the result of work the company has been carrying out in collaboration with the London South Bank University.

Their investigations revealed that metal connectors are particularly vulnerable to PIM. Researchers found that the universally accepted multiple metal-segment design results in return signal paths and the creation

of multipath transmissions leading to 'ghost signals' and harmonics.

Moreover, Hughes Electronics says each conductive segment creates micro-separations in the transmission path forming intra-media signal transition points. This results in reflections, energy loss, distortion, arcing and capacitive junctions, all of which negatively interfere with legitimate signal transmissions.

WaveWay uses a single-piece forward



and return path mechanism. As a result, it's claimed separations are removed and signals constrained, severely restricting multiple-signal path opportunities and consequent PIM effects.

It is constructed from a non-metal composite material. This is claimed to create an isolation layer from energy fields while at the same time absorbing microphonic vibrations, resulting in significantly reduced PIM readings.

Emergency comms in 10 minutes with compact TETRA

The *Claricor Cell* from Airbus Defence and Space (ADS) is a compact communications network based on TETRA technology. The small system

MANUFACTURER:
Airbus Defence and Space

PRODUCT: Claricor Cell

MORE INFORMATION: www.securelandcommunications.com

has been designed to be quickly set up for vehicle convoys, firefighters or rescue operations in remote regions.

ADS says the fully equipped system works as a standalone solution, or can be easily integrated into existing national or smaller TETRA networks. There are several options for voice and data transmission when using the base station and the TETRA switch in *Claricor Cell*, including fixed line, IP radio link, LTE and satellite.

The system comes in rugged

boxes to enable easy transportation and works in rolling vehicles. ADS says it can be setup by end-users within ten minutes.

Claricor Cell has an IP65 protection rating against dust and water with the covers closed, and IP54 when it's in use. ADS says the tap-proof TETRA system is pre-configured and has a plug-and-play functionality.

Features and apps include individual and group calls, SDS, and status messages. A single switch system



also includes the following which are integrated in a rugged PC: RCS lite dispatching; MMI; set for parameterizing the radios; and element monitor.

IP modem transceives DVB-S2X with "utmost efficiency"

WORK Microwave reckons its *AX-60* platform provides the high performance necessary for IP trunking and IP network infrastructure applications.

The system includes modem, modulator, and demodulator options. By using the *AX-60*, the Germany-based satcoms equipment specialist claims operators can transmit and receive DVB-S2X signals with "utmost efficiency" and simplify operations. It says the platform is completely customisable



and scalable, and capable of adapting to any throughput, data analysis method and other waveforms beyond DVB-S2X.

By providing operators with a future-proof and flexible system for both standardised DVB-S2X and customised satcoms, WORK reckons the *AX-60* simplifies the transition toward an all-IP environment.

According to the firm, optimal use cases for the modem include high-speed network links over satellite, IP-based SNG, connection to and from LEO satellites for Earth observation, reception and analysis of satcoms, and more.

MANUFACTURER:
WORK Microwave

PRODUCT: AX-60

MORE INFORMATION:
www.work-microwave.com

VSAT services 'mimic' high-speed fibre at sea

Mission-critical communications specialist EMC (now part of Global Eagle Entertainment) has launched a new package of connectivity and content for ships at sea. The VSAT services leverage global Ku-band, and are said to be optimised for the latest next-generation high-throughput satellite (HTS) networks.

The package includes EMC's *SpeedNet* high-speed web browsing technology which works in the background on mobile and desktop browsers and is said to dramatically accelerate page load times.

Using a proprietary intelligent protocol and global backbone, EMC says *SpeedNet* predictively fetches, compresses and pushes multiple layers of websites at once to local servers. It claims the net result for the end-user is a browsing experience that mimics being on high-speed fibre.

In addition, EMC has launched a new back-end billing and account management platform that allows admin and crew networks to be managed separately from a single portal. Individual crew members can even transfer funds to mobile accounts of friends and family at home on more than 400 carriers in more than 100 countries.

The new service also includes live TV using a single satellite antenna on board and the same Ku-band network that delivers voice and data services.

MANUFACTURER: EMC

PRODUCT:
Marine VSAT services

MORE INFORMATION:
www.EMCConnected.com

F-Cell tech revolutionises small cell deployment

Bell Labs – which is now part of Nokia following its acquisition of Alcatel-Lucent – reckons it's come up with a "breakthrough" in small cell technology.

It says *F-Cell* eliminates the costly power and backhaul wires and fibres currently required for small cell installation, and enables "drop and forget" deployments anywhere. Bell Labs recently demonstrated the

MANUFACTURER: Nokia

PRODUCT: F-Cell

MORE INFORMATION:
<http://nokia.com>

world's first drone-based delivery of an *F-Cell* to a Nokia office rooftop in California (*pictured*). It says the unit wirelessly self-powered, self-configured, auto-connected to the network, and instantly began to stream HD video.

The system's architecture comprises a closed loop, 64-antenna Massive MIMO system placed in a centralised location. This is used to form eight beams to eight energy-autonomous (or solar powered) *F-Cells*. Bell Labs says each of these has been redesigned to require minimum processing power so that the solar panel is no larger than the cell itself.

In this way, the firm claims *F-Cell* technology sustainably solves today's small cell and backhaul cabling,



deployment and expense challenges for service providers and enterprises.

It adds that the architecture supports non-line-of-sight wireless networking in FDD or TDD mode, and the parallel operation of up to eight individual 20MHz channels allows for a system throughput rate of around 1Gbps over existing LTE networks.

Zebra APs boost network performance

Zebra Technologies has introduced two access points that promise to offer greater network performance, stronger customer engagement, and support for IoT applications.

By embedding dedicated sensors that collect data across the entire expanse of the network, the vendor

MANUFACTURER:
Zebra Technologies

PRODUCT:
AP8432 and AP8533

MORE INFORMATION:
www.zebra.com

says its new enterprise-class *AP8432* and *AP8533* access points deliver

actionable insights and secure connections in a cost-effective way. Zebra reckons the 802.11ac devices can deliver a "dramatically higher" density network with the sensors needed to measure, monitor and secure each connection.

Both APs include the company's *Triple Sensor Technology*. It says this can automatically protect against RF interference and security risks, push relevant contextual offers and services to consumers, and provide



strategic-shaping analytics. The technology integrates three sensors to monitor the network, Bluetooth, and RF spectrum. Unlike other sensors that can only scan part-time, Zebra says its dedicated dual-band sensor continuously scans for rogue devices.

In addition, the *AP8432* features built-in PoE-out, enabling it to connect to IP video cameras, wireless temperature sensors or any other third-party IoT network.

Wi-Fi workflow solution for field technicians

The *WaveGuide* app from software defined monitoring specialist Mariner xVu aims to enable any field technician to quickly install and certify that a new Wi-Fi network will provide the best service.

MANUFACTURER:
Mariner xVu

PRODUCT: WaveGuide

MORE INFORMATION:
www.marinerxvu.com

Available on *Google Marketplace*, the app allows any field technician to perform four workflow functions: location testing and troubleshooting; optimal access point placement; home certification; and reporting and customer sign-off.

Mariner xVu claims the solution offers a number of unique features and benefits. For instance, it checks for interference, congestion and signal strength coverage around the premises, finding the best location for the AP placement. Using intelligent algorithms, the app analyses the

current configuration against ever changing environmental factors and interferences to recommend optimal configuration.

The company says a guided "drill-down" approach leaves little to no interpretation of the results by the service technicians. It adds that an intuitive user interface makes the process easy.

WaveGuide is also said to be self-healing, and service providers can continuously monitor the configuration and performance metrics of the Wi-Fi network.

ALSO LOOK OUT FOR

Interoperable 400GbE test system unveiled by Ixia and Viavi

Ixia and Viavi Solutions have publicly demonstrated the world's first interoperable system running bi-directional 400GbE line rate traffic with RS-544 FEC as currently defined in the IEEE 802.3bs draft standard.

According to the partners, leading network equipment makers are heavily investing in the development of ASICs and new intellectual property for the next generation of higher speed switches and routers to address growing bandwidth requirements.

They say robust test tools are needed throughout this development to identify potential bugs and eliminate ASIC and hardware re-spins, which waste human resources, increase development costs and delay time to market.

Ixia and Viavi demonstrated full interoperability of their independently developed MAC, PCS, and RS-544 FEC IP (including the critical FEC element that enables 400GbE error-free data packets to be carried over fibre links) on readily available hardware components.

Ixia says its full portfolio of network infrastructure test systems, including the 400GbE test system, offer the same send/receive capabilities on all speed ports, with packet lengths as small as 49B, which is smaller than the minimum Ethernet frame size. It is also capable of sending and receiving a single 400GbE line rate flow at any packet size.

Meanwhile, Viavi says its *Optical Network Tester* has been proven in lab evaluations of 100G components, and now has the industry's first 400G support to include FEC and PAM4 modulation.

As a result, the two firms say high-speed network providers now have a comprehensive, integrated platform for design, development, and validation of 400G technologies including CFP8 pluggable 400G optics.



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Blue sky thinking



As well as the digital divide, the industry needs to bridge the energy divide. Vodacom has shown how this can be done with its solar and wind powered base stations in remote parts of Lesotho.

While traditional options such as satellite offer one way for mobile operators to expand their networks into remote and rural areas, they may not always be economically viable. RAHIEL NASIR looks at other innovative alternatives.

Whether you take data from the ITU, Ericsson's regular *Mobility* reports, or even Facebook (which has been studying global internet access since 2014), the conclusion is always the same: more than half of the world's population is still offline. And according to the 2016 edition of the ITU's *State of Broadband* report, the lowest levels of internet access are mostly found in Africa. It forecasts that by the end of this year, almost 75 per cent of the continent's population will not be connected to the net (see *News*, Aug-Sep 2016).

One of the key barriers to access is the lack of infrastructure needed. As a study from World Telecom Labs (WTL) revealed earlier this year, it is no longer enough for mobile operators to expand their networks to remote and rural areas just to provide voice connectivity – data (i.e. internet connectivity) is now also crucial.

According to 96 per cent of the respondents in WTL's survey, universal service funds (USF) offer huge potential to solve connectivity and

service delivery issues in rural environments. But concerns were raised about the sustainability of rural investments, and many respondents were unfamiliar with the specialist companies that have developed equipment specifically designed to build commercially viable networks for rural communities.

Smart networks

WTL itself offers *Vivada* (*Village Voice and Data*) to enable operators to build GSM, Wi-Fi and fixed data networks in rural villages for what's claimed to be minimised capex and opex. The system is said to operate on less than 200W which can be supplied by solar cells with a battery backup.

In addition, by using patented VoIP compression techniques that reduce bandwidth requirements, WTL claims satellite backhaul costs are cut in half. It adds that just 256Kbps is needed for 30 simultaneous calls.

Vivada provides everything needed for an operator to rapidly deploy a GSM and data network to a rural area – from a low power BST and mast, to the SMS server that supports 100,000 messages per day, BSS and other back office equipment and services. WTL reckons operators typically see a return on investment over a 15-month period.

The company has built a number of networks in rural Africa, including one for AMO Telecom (AMOTEL) in Tanzania. Its project is being financed by the Universal Communications Service Access Fund as part of a USD9.6m investment to improve connectivity in Tanzania that was announced last year.

AMOTEL is the country's first MVNO operating through national incumbent Tanzania Telecommunications Company Ltd (TTCL). In a proof of concept trial, the operator initially deployed *Vivada* to three villages that are not currently covered by any kind of network. The system has brought voice and data connectivity

to remote rural communities close to Lake Tanganyika in Katavi Region, and was rolled out to other villages in the Kigoma, Njombe and Kilimanjaro regions in July 2016 (see *Connecting the Carriers*, ppXX-XX for the full case study).

Elsewhere in the world, other innovative solutions to create wireless networks in remote and hard-to-reach areas are also being trialled or deployed.

For example, as part of the *Serval* project in Australia, researchers from Flinders University are testing a small USB-powered Wi-Fi transmitter that can be connected to smartphones to create a mesh-style wide area network. Using a free app for *Android* devices, the smartphone connects to the hub which can then link to others using Wi-Fi as well as long-range VHF. According to the researchers, the resulting mesh network can cover many kilometres under ideal conditions.

Meanwhile in New Zealand, Vodafone has trialled its portable *Z-Car* system that features a 4G small cell built into a car boot to provide temporary mobile coverage in disaster zones even while the vehicle is in motion (see photo below).

Vodafone is of course no stranger to creating solutions for areas that lack connectivity. Over the years, its CSR arm, the Vodafone Foundation, has been developing the *Instant Network* programme. This now includes a variety of innovative products such as the *Instant Network Mini*, an 11kg mobile network in a backpack that can be deployed in just 10 minutes, enabling aid workers to connect and carry out life-saving work in disaster situations.

Bridging the energy divide

Before bridging the digital divide, industry stakeholders need to bridge the energy divide. As is well-documented, lack of grid power is another key obstacle MNOs face when it comes to expanding their networks to remote and rural areas. This is where renewable energy sources can help.

For instance in 2012, Vodacom Lesotho said 40 out of its 165 base station sites in the country were now powered through a combination of solar and wind, along with other environmentally



Z-Car is a prototype mobile network on wheels developed by Vodafone New Zealand. The vehicle has a 4G small cell built into its boot which provides coverage over a 2km radius, even as the vehicle is in motion. Download speeds of up to 10Mbps and 2Mbps upload are said to be achievable. The car can also communicate with the digital trunked radio systems used by the emergency services.



MVNO AMOTEL has deployed World Telecom Lab's *Vivada* system in rural Tanzania. It includes a micro GSM base station, Wi-Fi routers and modems, backhaul integration, billing software, VoIP switches and an SMS server.

conscious technologies. These include power system optimisation to ensure that in the event of a power failure, a traditional site can continue to operate for up to three hours on stored battery energy before a diesel generator kicks in. In addition, the operator is using smart meters to monitor power consumption while centralised control systems are used to operate base station sites remotely. Both technologies had reduced the need for physical site visits.

Speaking at the time, Vodacom said Lesotho's physical geography lends itself to supporting the latest sustainable base station technology based entirely on solar and wind power. Its aim was to pioneer work in the area in an effort to provide mobile communications to previously unconnected communities in the country's most remote areas.

Across the border in South Africa, Vodacom has supplied electricity for the first time to a rural community in Northern KwaZulu-Natal. Twenty-five per cent of the total electricity generated by the cellco's base station in Emfihlweni is being used to supply power to the water pump, a shop that provides a cellphone charging station for local residents, and the high school which was able to switch on the power to its computer centre for the first time.

Of course, not all cell sites are able to totally benefit from renewable energy sources such as solar or wind power, which means MNOs still having to bear the high and often prohibitive costs of using diesel to run their BSTs in rural locations. But even here, technology has the answer.

Earlier this year, Eltek announced that it had now installed more than 10,000 hybrid solar-grid power systems to remote telecom sites around the world since launching its systems in 2008.

Instead of using diesel as a backup, the Norwegian energy specialist's hybrid solutions combine solar and high-efficiency DC power systems. The company claims their use has led to more than 900,000 tons of CO₂ being eliminated from the atmosphere, and cut electricity opex for

operators by more than USD400m. While the savings at each site vary significantly and depend on the equipment configuration and site power requirements, Eltek says energy expenditure is typically cut by 70 to 80 per cent. This is mainly due to less diesel consumption by generators and a reduced service cost. The company adds that a hybrid solution also provides significantly improved reliability and uptime.

Whether input power comes from solar panels, wind turbines, diesel generators or mains, Eltek reckons its hybrid energy power conversion equipment will make sure that power conversion loss is minimised. It says that by optimising the control and using the hybrid solution, energy is not just replaced kWh by kWh, but the emissions per kWh also drop significantly.

All the energy sources, solar and wind chargers and the diesel generator at a cell site are managed by a single controller. Eltek says its *MultiSite Monitor* makes it possible to have a network wide overview to optimise utilisation of energy sources and site performance.

If a region does benefit from some existing fixed telecoms infrastructure, Albis-Elcon reckons its new remote powering system can help bring broadband to rural areas. The company (which is now part of German-based telecoms solutions specialist UET United Electronic Technology) says its *RPS 1600* remote powering system for FTTx nodes and small cell networks is being used by a number of global network operators for affordable delivery of broadband services to major cities and rural areas. Various companies are currently trialling the system in Africa, including Botswana Telecommunications Corporation and Swazitel.

The *RPS 1600* leverages existing copper lines and has been designed to enable network operators to supply power to remote equipment without having to lay new cables or engage in third-party contracts. It is said to support

long-distance power consumption for up to 1.4kW per site at a distance of up to 6km. By enabling copper infrastructure to be reused for the electricity supply of micro DSLAMs in the field, Albis-Elcon reckons its system provides network operators with significant opex and capex savings. It says the *RPS 1600* eliminates AC powering, digging, battery maintenance and installation, reducing the cost of rollouts by an estimated 40 per cent.

The system is said to feature a carrier-grade design, high level of safety protection, and an “intuitive” network management functionality via Albis-Elcon’s *MetroIntegrator* software. It includes the vendor’s *Power Supply Central 1600* unit with 16 sources and the IP68 rated *Power Supply Remote 080x* with 120W of output power per *PSR*-unit. Albis-Elcon says up to six *PSC1600* and 12 *PSR080x* units can be combined into a single system, increasing the total output power per location by up to 1.440W.

End-to-end solutions

Earlier this year, Nokia unveiled an end-to-end system that enables operators to use LTE to deliver high-speed broadband connectivity in hard-to-reach areas while maximising spectrum use in the process.

FastMile leverages unused, higher frequency LTE frequencies in rural areas, and harnesses them to extend coverage for LTE-based fixed wireless broadband.

Nokia says the system combines a specific fixed wireless radio antenna topology solution with interference mitigation techniques. It uses the company’s smart scheduler and is enhanced with small cells to deliver what’s claimed to be 2.5x throughput of a comparable mobile network. A cloud-based controller running on Nokia’s *AirFrame* system is said to ensure high data rates, enabling guaranteed throughput. *FastMile* also includes a router and outdoor modem with a self-tuning, high gain antenna. Nokia says this provides up to 12x typical coverage area compared to standard mobile broadband. All of this can be installed on top of any existing LTE network.

Nokia adds that *FastMile* focuses on keeping operator deployment costs to a minimum. It has an integrated installation capability that covers the residential equipment, RAN, controller, and smartphone applications to help users.

Meanwhile, rival Scandinavian vendor Ericsson says that despite the rapid growth in mobile communications, commercially viable business models are still lacking in many rural areas. To help address this challenge, the company has developed its *Managed Rural Coverage* solution.

In essence, this provides “connectivity as a service”, enabling operators to provide mobile coverage for a set period according to SLAs and defined KPIs. Access is delivered via low-power Ericsson base stations running on solar energy to avoid the opex and emissions associated

with diesel generators. The vendor adds that satellite is used for backhaul to avoid the high costs and civil works associated with building a microwave network in remote villages.

Last year, Ericsson partnered with MTN to deploy *Managed Rural Coverage* to parts of central and northern Benin where there were previously no services and people have to survive on less than two dollars a day. Under a five-year contract that covers 50 sites, Ericsson says they now have affordable mobile connectivity, and will be able to benefit from increased access to information and services that support health, education and small businesses. ■



Eltek’s hybrid energy systems combine solar and high-efficiency DC power systems. The company claims their use has cut electricity opex for operators by more than USD400m.

CREATING THE WIDEST AREA NETWORK ON THE OPEN SEAS

US-based connectivity specialist Peplink – which offers its products in Africa via resellers in Mauritius, Morocco, Uganda and South Africa – has developed internet load balancing and VPN bonding solutions based on SD-WAN routers and access points. Last year, it announced that its solution was used to provide diverse connectivity on the world’s longest ship.

With an overall length of 382m *Pioneering Spirit* (formerly *Pieter Schelte*) is the largest twin-hulled vessel ever built and is also the widest at 124 metres. Owned by Swiss company Allseas, the USD2.3bn ship is ostensibly a crane platform and is being used for the decommissioning of Shell’s 24,000 ton Brent Delta oil rig off the coast of Scotland.

Instead of using VSAT, Allseas wanted additional diversity and communication redundancy to supplement *Pioneering Spirit*’s existing ship-to-shore communications.

At the core of its new system is Peplink’s *Balance 710*. This prioritises WAN connections initially from point-to-point Wi-Fi, LTE/3G

using the vendor’s IP67 *MAX HD2* router, VSAT, and finally from tethered data via an Iridium satellite phone.

To maximise WAN diversity, one *MAX HD2* is placed on each side of the vessel spread 300 metres apart to maximise signal reception. Peplink says this setup is designed to maintain a continuous connection and is also configured to prioritise the most affordable WAN connections.

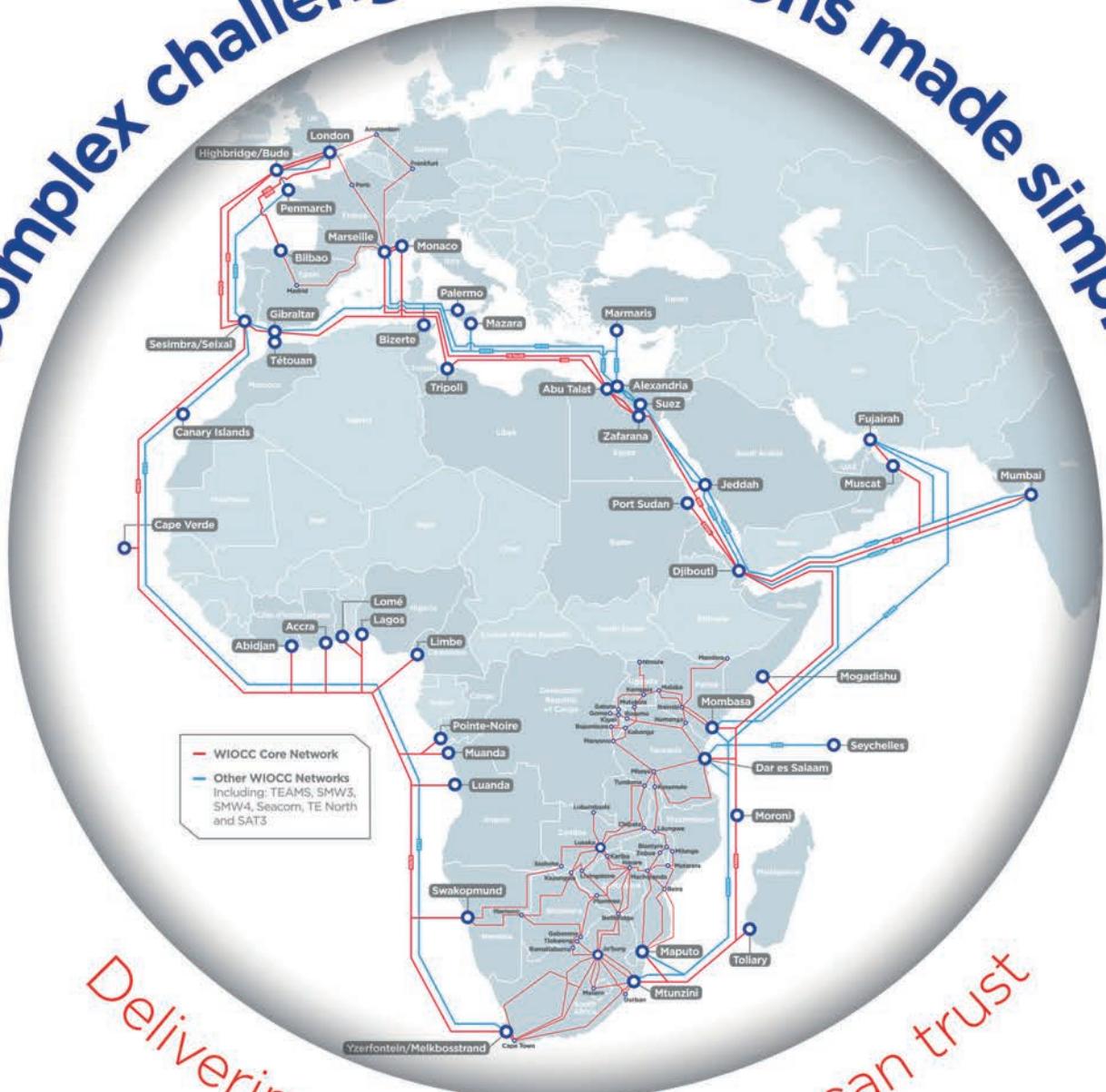
At shore, *Pioneering Spirit* connects using point-to-point Wi-Fi or cellular connections provided by the routers if this is unavailable. When the vessel moves out of all terrestrial coverage, VSAT takes over with the Iridium phone as an additional failover option.

While the main reason for choosing Peplink was its ability to prioritise WAN connections and failover between them, another benefit was the company’s *InControl 2* management software. This is said to offer convenient cloud-based remote access and monitoring, along with powerful GPS tracking features.



With an overall length of 382m *Pioneering Spirit* (formerly *Pieter Schelte*) is the largest twin-hulled vessel ever built and is also the widest at 124 metres.

Complex challenges - Solutions made simple



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Three Tanzanian villages now have GSM and an internet cafe for the first time thanks to MVNO AMOTEL. Local engineers have been trained to manage the cellular and Wi-Fi networks.

Connecting the carriers

While network operators and communication service providers are on a mission to connect their customers, who connects them?

As part of efforts to expand its service offerings to SMBs across Africa, Vodacom has developed a VSAT-based offering that aims to speed up the process of deploying broadband services for enterprises.

The introduction of Vodacom Business Converged Satellite (VB-Sat) has enabled the company to provide ubiquitous coverage, a wide range of service plans, a clear migration path into the future, and a single vendor solution.

The service is designed for corporate and government users with centralised or distributed IT infrastructures across metropolitan or outlying areas.

The network architecture consists of a VSAT installation at a customer's site. This typically includes a 'satellite access point' which is configured with a Hughes broadband VSAT router, 120cm and 98cm antennas, and a 2W radio, connected to the LAN primarily via Ethernet. All this communicates via satellites and the main earth stations where the VSAT hub baseband systems are located and connected to the managed Vodacom Business IP network.

According to the operator, combining technology and spectral efficiencies with uniquely designed service plans make it possible to deliver satellite-based services cost-effectively.

But in order to do this, it needs to provide both managed and broadband services over a common

existing infrastructure with varying levels of management and bandwidths.

As a result, Vodacom needed a satellite partner that could not only accommodate its existing service design requirements, but also scale as its customer base increased. Working with Intelsat helped the company transform its existing satellite commitments into a service model that would support a broader range of objectives. As well as the delivery of broadband and a managed satellite services, this also includes offering access to broadband internet, VoIP, as well as MPLS VPN services.

As part of the evaluation process, Vodacom reviewed the TCO that would be required for each of its go to market options including comparing Ku- and Ka-band deployments.

This revealed that the Ka-band option would have required additional investment in new infrastructure or use of out-of-country or third-party teleports. This would have limited network control, increased infrastructure investments, and added to the complexity of integrating Vodacom's OSS and BSS platforms.

Ku-band's higher availability and lower susceptibility to signal degradation and rain fade is said to provide Vodacom with a market edge. Since the *VB-Sat* service was specifically targeting enterprise customers, the operator could rely on the carrier-grade platforms on which it had built

its success in other vertical markets.

Augmenting the largest pool of capacity serving the continent, Intelsat adds that its upcoming high throughput *EpicNG* platform will also allow Vodacom to further drive down the cost per bit for services delivered.

Tanzania's first MVNO connects villages

In Tanzania, AMOTEL and its technology partner World Telecom Labs (WTL) have provided a blueprint for building sustainable, commercially viable networks across rural Africa.

Established in 2015, AMOTEL was Tanzania's first licensed MVNO. Its mission is to embrace new innovations and developments to serve low ARPU rural areas with little or no infrastructure. The company estimates that in Tanzania the current mobile subscriber base is only 28 million out of a total population of 50 million.

The company shares the same well-documented challenges in building and maintaining networks in rural areas as all other operators in Africa: low ARPUs, remote communities, lack of trained engineers, equipment developed for rich western markets, long ROIs, etc.

Of course, there are many vendors providing solar-powered base stations, diesel gensets, VSAT, etc., and all the components necessary

to run a rural network. However, there are few that can provide a complete system. After an extensive research period, AMOTEL decided to deploy the award-winning *Vivada* (*Village Voice and Data*) system developed by Belgium-based World Telecom Labs (WTL).

Vivada has been specifically developed to provide operators with a cost-effective, quick to deploy and sustainable system for providing GSM and data connectivity in rural areas. The system's package includes a micro GSM base station, Wi-Fi routers, backhaul integration, billing and provisioning software, VoIP compression switches, and SMS servers. The entire setup is said to run on less than 200W which can be supplied by solar with battery backup.

In July 2016, the first AMOTEL/WTL networks went live providing voice and data to three villages in the Mwanga District of the Kilimanjaro region, bordered to the northeast by Kenya. They are a two-hour drive along rough road to the nearest modest town and at least seven hours from Dar es Salaam. Each village has a minimum of 1,500 people with ARPUs of around USD2.5, and up until now, they have never been covered by any kind of telephone network.

Local engineers have been trained to manage the networks which provide GSM and Wi-Fi, and have a radius of 12km to cover people living outside the village centres. Traffic from the villages is validated by WTL's real-time charging system and voice calls are then converted into VoIP and compressed using the company's award-winning VoIP SBC. This uses patented technology to minimise the amount of bandwidth required on the satellite backhaul. Calls are transferred to a hub in Dar es Salaam where a WTL switch routes them onwards.

The networks were a hit with users from the start with people queuing to buy SIM cards. And as most villagers do not have smartphones or devices capable of connecting to Wi-Fi, the new AMOTEL cyber café has also provided to be extremely popular.

AMOTEL has identified four key factors that it considers essential for the successful deployment of rural networks by MVNOs, ISPs, and other organisations.

Firstly, it says they should ensure that technology partners can advise on all aspects of the project, both commercial as well as technical. Secondly, they should make sure that any agreements with MNOs are both transparent and comprehensive. Thirdly, a model should be proposed for the MNO which clearly illustrates a win-win situation from day one. And finally, the operator says a focus should be kept on opex and TCO in addition to initial capex.

AMOTEL's deployment was financed as part of the Universal Communications Service Access Fund's (UCSAF) USD9.6m investment to improve connectivity in Tanzania. Following the success of the implementation, UCSAF has agreed to release further funds to build more networks.

Meanwhile following extensive interest from wholesale carriers, WTL says it has invested significantly in developing new and innovative components for its original *Vivada* system to make it suitable for the wholesale market. This includes creating a platform that interoperates with MNOs to allow them to continue running their existing OSS/BSS while enabling them to extend these to shared-infrastructure locations.

It has also developed a wholesale billing system to enable wholesale carriers to track rural traffic onto its operator customers' networks.

In addition, WTL has modified its patented voice optimisation technology on the backhaul. It says this will enable wholesale operators to reduce the required bandwidth and hence the cost which is vital, particularly if satellite transmission is being used.

Largest footprint across Africa

In August 2015, the MTN Group and Liquid Telecom entered into a partnership to extend their footprint across Africa, exploring ways to jointly offer customers access to the largest fixed and wireless footprint across the continent.

Building on this agreement, Liquid has since successfully deployed a long-distance fibre route across South Africa with MTN as an anchor tenant.

The partnership between the two firms covers wholesale, carrier-to-carrier, high-speed broadband, enterprise and fixed data services. It enables both parties to access each other's fixed and wireless networks in countries on the African continent.

The partnership took on a new dimension in South Africa last year when Liquid began a project



Liquid Telecom has deployed a long-distance fibre route across South Africa with MTN as an anchor tenant.

to connect the city of Polokwane in the north-western province of Limpopo with Centurion, a region located between Pretoria and Johannesburg.

The company had just 12 months to complete the operation, which included securing the wayleave application approvals required to carry out work on privately-owned land, as well as managing subcontractors. It also had to overcome some issues related to ground conditions for trenching.

Despite all this, in November 2015, Liquid completed the long-distance fibre route connecting Polokwane and Centurion. The project was completed on time and on budget.

The route provides MTN and other anchor tenants with almost unlimited capacity on a national basis, enabling access to two of South Africa's major hubs. As an anchor tenant, MTN has the advantage of owning dark fibre on the route, which now forms part of its wider transmission network across the country.

Liquid is now in the process of deploying another long-distance fibre route with MTN as anchor tenant. The 1,037km route will stretch from Polokwane in the east and southwards all the way to Ladysmith in the Uthukela District of KwaZulu-Natal. It is expected to take 24 months to complete.

Tackling SIM box fraud in Guinea

Fraudulent SIM boxes are a blight on networks both in Africa and overseas. In its *2015 Global Fraud Loss Survey*, The Communications Fraud Control Association estimated that SIM box fraud cost operators USD5.97bn in lost revenue. As a result, governments are also missing out on hundreds of millions in tax revenue from the operators.

In Guinea, a solution from Ghanaian Telco vendor Subah is now in place that is generating an extra USD1m in revenue every month for the operators with USD300,000 in extra taxes for the government of The Republic of Guinea.

Fraudsters use the internet and VSAT to convert international incoming voice calls into domestic calls and thereby avoid the higher termination rates. Their illegal SIM boxes can be found in the most innocuous places. They are often operated remotely with locals returning regularly to load credit or insert new SIM cards. In fact, so lucrative is this activity that some SIM box operation sites are protected by armed guards.

For operators, the fraudsters cause network congestion, poor QoS and problems with cell planning due to spectrum management issues. In addition, they deprive the operators of revenue with the knock on effect of reducing tax receipts for governments.

Guinea's regulator ARPT decided to take action. In November 2015 it appointed Subah Telecom which had already developed and deployed a solution to solve similar problems in its home country of Ghana. Unlike other products on the market, it's claimed Subah's system can detect and block SIM numbers, and locate and eliminate the physical SIM box itself.

In Guinea, Subah built a new independent NOC

and trained a local team to manage the process going forward. Since fraudsters can adapt rapidly to avoid detection and prevent blocking when illegal use of a SIM is detected, the company uses a multi-layered approach to tackle the problem.

It has developed a number of innovative features that are being used in Guinea. For example, Subah installed GSM gateways at the ARPT's premises as well as POPs across the world from which test calls are originated and terminated on the gateways at the NOC. This enables the company to detect international calls coming in through SIM boxes and terminating as local calls.

It has also come up with a customised algorithm which automatically inspects, extracts and transmits numbers identified as fraudulent to the respective operators for blocking. The algorithm monitors how long it takes the operators to block a number using a colour-coded system. Detected numbers not blocked after two, four and more than six hours are flagged up as blue, orange and red on the central management system. This enables the regulator to apply penalties to inattentive operators.

As part of the blocking process, Subah ensures that a number of the local SIMs used by fraudsters continue making calls so that the location of the SIM box can be discovered. Operators provide data about these local SIM numbers including information about local networks onto which illegal calls are transitioned including the BTS, MCC and MNC locations.

Subah's custom-built system, which is integrated with satellite maps, collates this information and transmits the findings to a tracking vehicle. A mobile BTS is used to zone in on the MSISDNs and IMEIs of the illegal SIM cards. Once these are detected, they are locked to prevent movement onto another BTS. A handheld signal detector is then used to identify the actual location of the Fraudulent SIM box.

In addition, the system has been configured to give comprehensive reports at the click of a button. These show the volume of test calls per day, bypass numbers detected, originating operator, terminating operator, ageing of numbers detected, and much more.

Since going live in June 2016, the system has helped ARPT identify and disable 18 SIM box operations using thousands of SIMs. The number of international incoming minutes in Guinea was recorded at 20 million in January 2016. As a result of Subah's system, 25 million calls were recorded by July. This equates to an extra USD1.5m in revenue every month for the operator with USD300,000 in extra taxes for the government.

Backing up Bharti and Vodafone

Bharti Airtel has more than 313 million customers across its operations in 20 countries in Africa and Asia. Its global network spans five continents and it has more than 400 interconnect partners.

In order to maintain its global presence, the operator uses Epsilon's *First Line Maintenance* solution in its aim to ensure maximum uptime and network availability in key global



Since 2010, Airtel has outsourced first-line maintenance to Epsilon's data centre in Paris as well as Telehouse East in London (shown above).

communications hubs. It has outsourced network maintenance to Epsilon and relies on it to keep critical interconnection points in London and Paris up and running and operating efficiently.

According to Epsilon, global network operators find it difficult to have experts on the ground in communications hubs around the world. For Airtel, the challenge was to find a solution that could cost-effectively serve its needs outside of its home markets in Africa and Asia.

While global connectivity is key to the business, the majority of the company's staff are located in markets where they also have domestic operations. What Airtel therefore needed was a solution that could fill resource gaps in critical interconnection points without needing to invest budget in full-time staff on the ground. In addition, it needed to use the available resource flexibly and address issues as they pop up. This mix of requirements meant it needed a partner with a unique understanding of outsourcing and the ability to deliver.

Since 2010, Airtel has outsourced first-line maintenance to Epsilon's *Telehouse East* data centre in London and *Telehouse 2* in Paris. As part of the programme, Epsilon says it performed a site survey with the client to establish the status quo of the facility and get the team familiar with the operations at the site. Epsilon staff were then added to the permanent access list to allow immediate site access whenever required.

Epsilon says it has delivered a service package tailored to the cellco's specific needs, with the flexibility to scale it up or down as required. The company's *First Line Maintenance* portfolio includes on-site maintenance, network monitoring, spare parts handling, and system integration services.

By outsourcing, Epsilon says Airtel is able to support its infrastructure in more places with a reliable and experienced outsourcing partner. The firm adds that its engineers are able to function as an extension of Airtel's team, and provide a seamless and integrated service which is backed by strict SLAs to ensure maximum uptime and availability.

Vodafone operates the second-biggest mobile network in Ghana, and according to figures from the country's National Communications Authority, as at the end of 2015 the cellco had more than 7.6 million subscribers and a 21.74 per cent market share.

Like most countries throughout Africa, Ghana has seen ever increasing mobile traffic on its networks. Over the years, Vodafone has given more people in the country access to the mobile internet through the development of a 3G network, and by connecting rural areas to the rest of the world. As a result, a growing number of user groups have placed great strain on the Vodafone Ghana's back office storage systems.

In its live network, the operator used NetApp's FAS series as its primary storage system and EMC products for the backups. The primary system stored internet traffic data, call records and billing records for two months. After that, the data and records were transferred to the backup system in the disaster recovery (DR) centre for storage over three years.

But skyrocketing user growth in Ghana has created massive data, and since 2014 Vodafone has faced two main challenges: firstly, the capacity, scalability and performance of its existing storage systems was unable to meet its current operational needs; and secondly, outdated storage systems, expensive expansion costs, and uneven resource allocation meant that the storage system for the live network had to be re-built.

In March 2014, following an in-depth analysis of Vodacom Ghana's requirements, Huawei proposed a solution to comprehensively upgrade and construct the operator's existing storage systems using bespoke solutions.

First, an overall backup and archive system was added to the existing systems in the data centre. The vendor's *OceanStor 9000* storage system, three *RH2288 V2* servers, and Commvault's backup software (formerly branded *Simpanda*) were deployed.

Huawei says the *9000* features distributed storage architecture and offers reliable data protection. It was used with Commvault's software to build a new backup and archive system in the production centre, and to migrate data backup that could be stored from two months to three years from the existing production system to the new platform.

Huawei's solution uses all-IP interworking technology to keep the existing networking architecture unchanged, and will also facilitate what the vendor describes as "smooth expansion" for future service development.

It adds that Vodafone Ghana can configure NAS nodes on demand without worrying about the deterioration of system performance due to expansion. Huawei says the *OceanStor 9000* allows linear expansion from three to 288 nodes, enables system capacity and performance to grow linearly as nodes increase, and has expanded a single file system with up to 40PB of capacity.

According to the company, Vodafone Ghana has suffered zero data loss thanks to its system's advanced data protection technologies and highly reliable designs. It says the operator is also benefiting from fully utilised storage resources, reduced device quantity, and simplified O&M management due to the central and unified data backup and archive system. Furthermore, Huawei reckons Vodafone Ghana has made TCO savings of more than 20 per cent compared to its original storage systems. ■

Andreas Serras, CEO of Intracom Middle East and Head of its subsidiaries in South Africa and Morocco, talks about the Intracom Telecom's group wide variety of solutions and services that cater for the African continent.

How long has Intracom Telecom been working in Africa?

Intracom Telecom is a global telecommunication systems and solutions vendor operating for nearly 40 years in the market.

The company has been active in the South African market since 2010 and is the supplier of choice for large WISPs and telcos in the country, especially with the deployment of WiBAS™, its point-to-multipoint (PMP) radio product line.

The Intracom Telecom Group has enhanced its presence in the African continent with the establishment of its subsidiary in South Africa. Furthermore, the Group also established a subsidiary in Morocco at the centre of Rabat. The company has successfully deployed its industry leading solutions in Africa, the Middle East, and other countries worldwide.



What's so special about WiBAS™?

Intracom Telecom's flagship product family, the WiBAS™ PMP radio, delivers state-of-the-art IP connectivity for the demanding backhaul required by heterogeneous networks, and in premium broadband and legacy access networks at an aggregate rate reaching 1Gbps per carrier at the hub site. It also enables a wide range of profitable business plans providing a key differentiator to operator success.

The company has also introduced a CPE terminal for residential and SMB subscriber access. The WiBAS™-Connect operates at 10.5, 26 and 28 GHz, and provides broadband connectivity with leading capacity up to 500 Mbps per carrier to subscribers who are presently constrained by the digital divide.

The WiBAS™-Connect enables access to information and entertainment services for subscribers in Africa, and enhances the competitiveness for the operators against legacy fibre/copper technologies due to faster rollout rates with high QoS.

Who is using your products in Africa?

As the market leader in PMP technology, Intracom Telecom has been selected by the continent's largest operators.

Deployments of WiBAS™ are now serving subscribers in Liberia, Ghana and South Africa. Networks have also been implemented in French-speaking West Africa, Guinea, Ivory Coast and Mali.

In South Africa, nationwide operators such as WBS and some of the largest ISPs, including Comsol Networks and Internet Solutions, have selected the WiBAS™ platform for enterprise connectivity and it has been installed in more than 2,000 sites.

What sets Intracom Telecom apart from its competitors?

The technology and expertise to implement large scale projects, and an international successful track record are our key advantages.

The company is also capable of combining its products with those of other vendors through its system integration capabilities. Local presence in the regions it operates in also acts as a differentiating factor.

What are your plans for Africa?

We expect to significantly grow our PMP business throughout the continent in order to address constantly increasing bandwidth demands, growing spectrum congestion, and the failure of the currently used unlicensed technology to meet the required quality of service.

Subsidiaries in Africa:

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INTRACOM TELECOM (Intratelecom SAR)

14, Rue Al Kairaouane – Angle Avenue d'Alger, Rabat, Morocco
t: +212 0537720089
sales@intracom-telecom.com



Andreas Serras

Furthermore, in line with the latest technology trends, and particularly the smart city concept, Intracom Telecom has developed a comprehensive portfolio of smart solutions.

These include Smart Parking; Smart Lighting; Surveillance; Traffic Management & Monitoring; Waste Management; Smart Metering and energy Management; and unparalleled integration capabilities with any IoT device.

Intracom Telecom's products and services therefore offer the best fit for Africa's municipalities, gated communities, universities/campuses, business parks, shopping malls, and many more. And on top of that, the company's innovations, successful track record, and expertise can contribute towards the modernisation of network, IT and public infrastructure.

Southeast Africa

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The power to evolve

Carriers in Africa can use Network Function Virtualisation to give themselves a competitive advantage, says CHRIS HADDOCK.

Network Function Virtualisation is a development that promises significant benefits for carriers, and momentum has grown rapidly since the technology's inception three years ago. Today, NFV is not just a drawing board concept that has potential but an approach that is being used by operators in live networks.

Over the next few years we can expect NFV to move to the centre of African mobile carriers' network infrastructure architecture. The technology fundamentally changes the way networks are built and operated, allowing more agility and flexibility in the way they can be managed, and how new services can be developed.

The key concept of NFV is that it can be used to virtualise entire network functions and systems in a carrier's network. These functions have traditionally been deployed as 'network appliances' on dedicated hardware which is often proprietary, usually expensive, and always difficult if not impossible to change without the help of the hardware provider. With NFV, carrier network operators can now leverage the

flexibility, price and performance of virtualised computing resources. They can deploy multiple network functions on the same, virtualised and standard hardware platform.

But the technology goes further than just using standard commodity hardware and building blocks of virtualised software. NFV also helps to break open the closed, rigid, 'hard-wired' nature of network functions. It holds the promise of delivering the network function flexibility, adaptability and agility that traditional 'dedicated box' approaches lack.

Centralised architecture drives efficiencies

Happening alongside NFV is the transition to IP multimedia subsystem (IMS) next-generation architectures. IMS offers a good opportunity for carriers to start virtualising their networks. It gives them the elasticity to scale as needed in order to deliver services more rapidly and efficiently. This means network functions do not need to be dimensioned for the annual peak but

run at substantially below their maximum capacity for most of the time; capacity can be increased for peak periods and decreased as required.

Diane Myers, research director for VoIP, UC and IMS at IHS, shares this sentiment: "One of the biggest drivers for NFV is the ability to scale services up and down quickly, and introduce new network services more efficiently and in a timely manner, which makes IMS a good early fit for NFV."

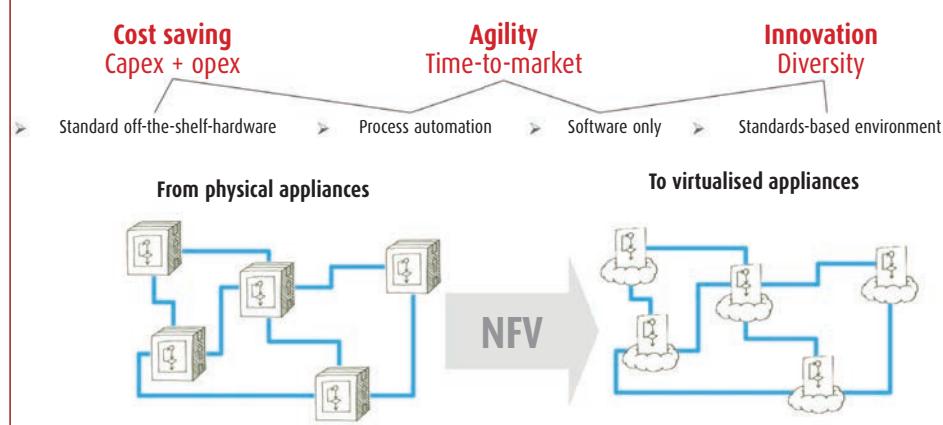
Some carriers in Africa are currently rolling out IMS networking infrastructures as they look to offer more than just basic voice and SMS services to subscribers. If a fully virtualised IMS network is deployed, carriers can scale its capacity as needed as their subscribers move from legacy networks to LTE and IMS services.

In Africa, ARPU is much lower than in other regions. Although this is offset to some degree as there are large numbers of prospective customers, it remains the case that the continent's carriers are in even greater need of reductions in capital and operational expenditure than many of their international counterparts. NFV and completely virtualised networks promise to deliver significant benefits in this regard.

This approach need not be limited to a carrier in a single country – there are tremendous economies of scale to be had from deploying a virtualised or cloud-based network once for use across a carrier group operating multinationally. For carriers with networks serving customers in multiple countries throughout the continent, such as MTN, Orange, Vodafone, *et al*, there are clear financial and efficiency benefits in having network functions that service multiple countries.

Furthermore, the pan-country, virtualised model can also be used to consolidate expertise in commercially attractive locations where the necessary skills are available, as well as to access markets in more troubled regions safely.

Telecoms virtualisation: what's expected of NFV?



Using NFV to take control of service development

NFV can be used to empower operators to evolve their networks and services at their own pace, ahead of and in response to local competition.

In Africa, smartphone ownership is surpassing computer ownership and mobile subscribers are becoming more sophisticated in their use of applications and services. More than anywhere else in the world, the smartphone is much more than a mobile phone. It is used for banking, giving people cheaper access to their finances; for healthcare and medicine, reducing the need for doctors to travel long distances; and for

commerce, central to the success of entrepreneurs and farmers. The use of mobile services is therefore vital to the region's people, even in the remotest rural areas. This makes it particularly important for carriers to be able to tailor their network functions and services to their local needs. Otherwise they could end up reflecting the functional needs (and the associated limitations) of countries with very different characteristics.

NFV makes it possible to develop substantial variations to pre-baked network services, and tap into the requirements of a specific customer base. African carriers can move to a web-style 'DevOps' model, where they provide specialised services to their customers and refine these regularly.



Chris Haddock,
Head of
marketing,
OpenCloud

VODAFONE EGYPT: A LESSON IN DEVOPS

Vodafone entered the Egyptian telecoms market as the second operator in 1998, and was formed by a consortium that originally also included Air Touch as well as local and international partners. In 1999, Vodafone Group acquired the Air Touch share, and three years later it purchased the seven per cent stake held by French telecoms giant Vivendi.

Over the years, Vodafone has become Egypt's leading mobile operator. According to the Ministry of Communications and IT's latest market indicators published in June 2016, there were 95.26 million mobile subscribers in the country as of March 2016. Vodafone currently has a market share of around 41 per cent.

The reputation and value of the company's brand are said to be built on Vodafone's global commitment to responsible and honest behaviour within the communities where it operates. Since its inception, corporate responsibility was an integral part of Vodafone's operation in Egypt, and alongside this it also has a commitment to innovation and the development of customer-centric services. This is the cornerstone of a DevOps mentality.

In 2014, Vodafone Egypt selected *OpenCloud Rhino* to deliver a range of core services and to enable innovation of future services. Full rollout of the service delivery platform (SDP) followed a successful proof-of-concept phase where a number of services were trialled.

The telco's main objective was to introduce a convergent and open SDP to consolidate existing GSM IN services on to one platform, and to enable the introduction of new services. As preparation for LTE and IMS, Vodafone Egypt wanted to develop services for use by both its GSM network and also IMS for LTE subscribers.

As an example of this, the first new service developed on the SDP was *Multi SIM*. This enables a subscriber to activate two additional SIM cards from their current mobile phone and for all the SIMs to share the master number. Users can then initiate and receive calls as well as SMS messages from any of the cards, and their main number will be presented to the other party.

An extremely important aspect of the OpenCloud proposition was the openness and high productivity of the platform, enabling local development companies to produce services instead of traditional vendors. This means Vodafone Egypt can commission services from local development partners and gain the efficiencies of local supply, alongside contributing to and helping grow the country's economy.

Following the successful 'go live' of *Multi SIM*, a range of other services have now been created by local development companies. The open SDP enables Vodafone Egypt to not only compete with superior, differentiated business and consumer services, but also with customer service as well as on price.

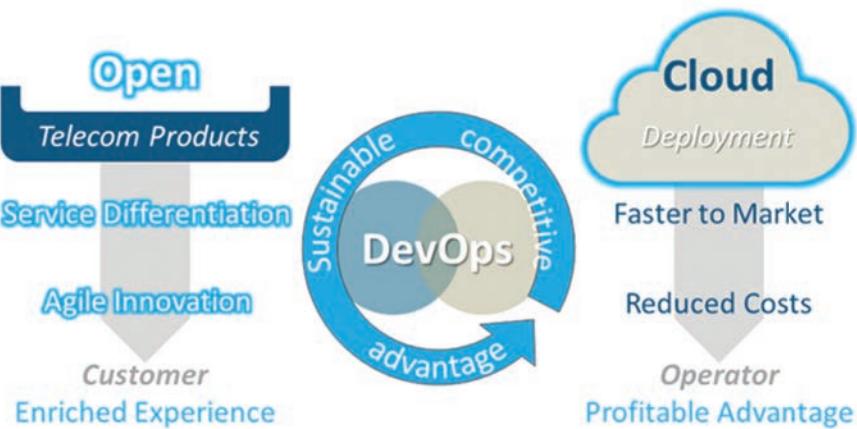
In addition, NFV assists the DevOps-style service development and testing model. Traditionally in telecoms, carriers have used a physical test network to validate their new services prior to deploying them in the live network. Access to the test network is typically the major bottleneck in the service development and deployment lifecycle. With an NFV-based network, multiple cloud-based replica test networks can be created rapidly, at a very low cost as and when they are needed. The test and validation bottleneck to service deployment is removed, and perhaps just as important, the virtualised test network provides an accessible and cost-effective experimental testbed for new innovation.

NFV therefore encourages innovation where development and operational deployment are closely linked. The evolution of services can come from internal developers or third parties who can create specific applications and customised solutions for different user segments. NFV also makes it easier for carriers to create bespoke services that are targeted at specific regional markets and can alter them for regulatory requirements. This can support the move towards network regionalisation as service variants can be easily developed and rolled out to various countries or regions from a single network location.

Furthermore, a focus on service development can become commercially feasible for carriers as virtualisation enables service scalability. The inherently flexible nature of virtualised software means that services can be scaled up or down, depending on the need for capacity at any given time. This 'grow on demand' facility mitigates risks when launching new services. As a result, consumers and businesses in Africa could see a range of new value-added services created specifically for their needs.

Telecommunications in Africa is undergoing rapid change with the emergence of smartphones and LTE networks. Investment in NFV can enable carriers to scale their networks and services in line with customer demand, rather than buying capacity upfront according to business model user projections. It offers a more economic and efficient model for converging and centralising their networks.

African carriers can also use NFV as an opportunity to differentiate their offerings and serve their subscribers better. Services that are designed to meet the specific needs of customers need to be conceived, created and refined locally by people who understand the specific market requirements. NFV can be a key enabler of service agility and flexibility across the continent's growing telecoms marketplace. ■



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First NB-IoT network set to go live



The world's first commercial NB-IoT networks will go live first in Spain, the Netherlands, Ireland and Germany, Vodafone has revealed.

NB-IoT is the newly agreed standard for an industrial grade low power wide area (LPWA) network layer that will allow millions of everyday objects to be connected to the IoT.

Vodafone's IoT director Ivo Rook says: "The questions of battery life and deep in-building penetration have now been answered by NB-IoT. The low cost of the modules means we

can expect a new wave of connected devices and soaring market demand."

For Vodafone, the NB-IoT rollout will involve a simple software upgrade to its existing 4G base stations. The operator says this means that the rollout will be rapid and deliver nationwide coverage almost immediately.

The initial rollouts will be followed by other markets during the rest of the year with full coverage of Vodafone's global network by 2020.

Earlier in October, Vodafone said that it had completed the world's first test of



In October, the world's first test of an NB-IoT connected device was carried out with a sensor buried in a parking space at the Vodafone Plaza in Madrid.

an NB-IoT product on a commercial network. Vodafone Spain connected a sensor buried in a parking space

at the Vodafone Plaza in Madrid. A smartphone app displayed that the space was occupied when a car parked in it and went back to available when the vehicle left the space.

Vodafone reckons this practical demonstration illustrates how powerful NB-IoT has the potential to become, as it can underpin many services that can be created or enhanced with a communications layer. The company also hopes new products, services and applications will rapidly evolve with their system acting as a catalyst.

ITU develops universal laptop charger



A new standard has been developed by the ITU that delivers a universal charger for digital devices. Its aims is to improve energy efficiency and reduce e-waste.

Officially known as Recommendation ITU-T L.1002 or 'External universal power adapter solutions for portable ICT devices', it was developed by ITU-T Study Group 5, the union's standardisation expert group for ICTs, the environment and climate change.

ITU-T L.1002 specifies principles for the eco-design of laptop chargers to reduce no-load power consumption five times lower than the norm.

According to the ITU, one million tons of external power supplies are manufactured each year. When multiplied by the millions of such chargers in use, it says the new standard will greatly reduce the greenhouse gas emissions produced by these devices.

The union adds that the applicability of the charger to multiple devices, as well as design principles for the efficient use of raw materials, will greatly increase their lifetime and reduce the e-waste resulting from their disposal.

The ITU believes that the L.1000 series of standards will assist in meeting the e-waste target of the

Connect 2020 agenda, a shared vision for the sustainable development of the ICT sector adopted by ITU member states in 2014. This agenda includes the commitment of members to reduce the volume of redundant e-waste by 50 per cent by 2020.

"E-waste has grown into a significant challenge to environmental sustainability," says ITU secretary-general Houlin Zhao. "The L.1000 series of standards will contribute to the achievement of the targets set out by Goal 12 of the UN Sustainable Development Goals to ensure sustainable production and consumption patterns."

Siemens' One-satellite interference localisation technology goes live



Eutelsat Communications has validated the performance of what's described as a unique, one-satellite geolocation solution that is now being deployed across its global monitoring network.

The SIECAMS ILS ONE service developed by Siemens Convergence Creators assists in the localisation of interference signals without the need for an adjacent satellite. This increases Eutelsat's ability to intervene in the event of accidental or deliberate interference to customer signals.

The new deployment is said to be significant because previously two geostationary satellites were needed in close proximity to obtain sufficient crosstalk for reliable geolocation signal processing. When a suitable adjacent satellite is within reach,



Siemens Convergence Creators one-satellite interference localisation goes live for one of the world's leading satellite operators.

SOURCE: EUTELSAT, PHILIPPE STROPPA

share operational parameters.

Even for multi-satellite operators, Eutelsat points out that some satellites are isolated in terms of uplink frequency ranges, polarisation and footprint. This is especially true for Ka-band spacecraft where crosstalk is either not applicable or too small to be measurable.

Mark Rawlins, Eutelsat's director of the communications system control centre, says: "Having validated proof of concept, we are confidently deploying the unique one-satellite interference detection system.

"We are enhancing our ability to localise interfering signals transmitted to our global fleet of satellites so that customers from South America to Asia Pacific can benefit from even more reliable and secure communications."

MCCA set up to promote 4G LTE for public safety



Nokia has launched the Mission Critical Communications Alliance initiative (MCCA).

As a global collaboration of MNOs, public authorities and first response agencies, the alliance aims to formalise standards in the use of LTE for public safety. Nokia adds that it will also enable innovations to take place between partners to further advance the technology and services on offer.

The company hopes the MCCA will bring various stakeholders to a single platform that will inform and guide policymakers on the benefits of LTE-based public safety solutions for robust critical communications services. More than 10 major service providers and agencies such as Mobile Radio Centre from Japan and Vodafone Hutchison Australia are participating in the programme.

4G LTE provides public safety services including first responders with mission-critical features, and several countries are already upgrading their public safety systems to leverage the technology.

For example, South Korea Telecom has recently demonstrated the capabilities of Nokia's *Ultra Compact Network*, a portable small cell-based LTE network that can provide 4G connectivity for public safety in remote locations.

NASA completes unmanned test flight using Globalstar's ADS-B ALAS

 NASA says it has successfully tested the operation of Globalstar's ADS-B *Link Augmentation System (ALAS)* with an unmanned aircraft.

ADS-B has been designed as a low-cost replacement for conventional radar. It allows pilots and air traffic controllers to 'see' and control aircraft with more precision and over a far larger percentage of the planet's surface than has ever been possible before.

Aircraft equipped with the system use GPS receivers that can identify their precise position from the GNSS

constellation. This is then combined with other aircraft specific variables such as speed, altitude and heading to deliver complete aircraft location data. And when over the horizon, Globalstar says its satellite fleet can still accurately pinpoint the aircraft.

The test flight was carried out at NASA's Langley Research Centre. The initial results indicated continuous communication between an unmanned *Cirrus SR22* aircraft and Globalstar's satellite system, with only brief interruptions during extreme manoeuvring which it's

claimed were reconnected quickly.

"NASA not only demonstrated that *ALAS* could perform well in manoeuvres, but also confirmed that complex data such as flight control commands and aircraft state and status could be passed to a controller over the same robust Globalstar link in real time," says Skip Nelson, president of ADS-B Technologies. "This tells us that *ALAS* could provide a single, secure and potentially encrypted portal between the aircraft and the ground."

The flights focused on testing the ability of the system to continuously



The tests involved a remote controlled Cirrus SR22 aircraft connected via Globalstar's satellites.

LIBRARY PHOTO

pass two-way data between the aircraft and NASA's ground control station using remote control capabilities.

High-performance VSAT delivered to LNG fleet

 NSSLGlobal will replace the under-performing and unstable legacy VSAT system on board a fleet of 15 liquefied natural gas carriers operated by MOL Transport (Europe).

The new system meets the Japan-based logistics company's need for performance and support to deliver faster, more robust operational connectivity and ship-to-shore remote access, alongside improved crew welfare and MLC-2006 compliance.

MOL's fleet of liquefied natural gas (LNG) carriers will be the first to benefit from the new technology. NSSLGlobal says it was important that the installation took place while the ships continued in service. As a result, the company's engineers travelled with the ships and

carried out the work in-situ before disembarking at the nearest port.

NSSLGlobal says that the new system it has put in place will give MOL's ships greater flexibility, stability and availability of communication services to operate more efficiently.

Commenting on why MOL chose to work with UK headquartered NSSLGlobal, Pete Adsett, IT supervisor for MOL LNG, says: "Our very thorough tender process concluded that NSSLGlobal has the best combination of network performance, flat-rate pricing and support in the industry. The fact that NSSLGlobal owns and controls its own global VSAT network gave me the confidence it could deliver against our performance requirements and SLAs."

 The village of Kimmeridge in the UK county of Dorset can now access wireless broadband via the *Airwave* branded service deployed by VoIP Unlimited and its privately-owned IP network.

The internet telephony provider says its engineers laid fibre across the remote rural area to a licensed microwave link which spanned a bay to a newly installed mast. By over-engineering the project and adding two antennas on the mast, the company says the connection has dual resiliency.

Located on the Isle of Purbeck, Kimmeridge has around 90 residents and its coastline forms part of the Jurassic Coast, a World Heritage Site. With the land being protected, VoIP Unlimited says it had to

overcome legislative challenges during the deployment. For instance, visual impact statements were mandatory, and an archaeologist was hired to oversee any excavation.

Securing the new mast with concrete was also another hurdle, as the mixing process had to be done at the top of the hill due to its gradient and mixed in one go. VoIP Unlimited says its teams therefore needed to ensure absolute accuracy as this could only be done once.

The village now benefits from 50-times faster connectivity, according to MD Mark Pillow. "To put that into perspective, the difference in internet speed means a customer using *Airwave* can now download a full TV episode in less than three minutes, rather than over 35 hours."

QuarkSe and Etisalat demonstrate eSIM-enabled supercar



As the IoT accelerates towards universal adoption of the eSIM, the Rimac *Concept S* supercar is the first to show the application of the standard in vehicles.

 The first eSIM solution from IoT application provider QuarkSe has been commercially launched. The new technology is central to enabling the electric car developed in partnership with Rimac and Etisalat in the UAE.

"Allowing our customers to connect their Rimac *Concept S* supercar for telematics and support with the best network at any location, and to use the mobile number they wish, is in line with our promise to

deliver the best customer experience with state-of-the-art technology," says Mate Rimac, founder and CEO of Rimac Automobil. "QuarkSe is supplying a disruptive solution to the industry, and we are glad to have Etisalat as the first mobile operator to deliver eSIMs over the air to our cars."

eSIMs are designed to enable a quick and easy activation process for a much wider array of devices than before, such as wearables, smart metering, smart city elements and

cars as well as mobile phones, laptops, and tablets. The GSM Association is promoting the universal adoption of the eSIM as the eventual replacement for physical SIM cards. It is expected that almost 90 per cent of devices will use the technology by 2020.

Rimac's supercar with the eSIM download and its activation process were demonstrated at GITEX 2016 that took place in Dubai in October. It represented the first time a supercar has been eSIM-enabled.

Taxi digital highway

 With the deployment of Motorola Solutions digital radios, more than 60,000 residents of El Oro Province will benefit from a more efficient taxi service from the Zaruma Urcu Transportation Cooperative. The new radios are said to offer "superior" audio quality and also allow taxi drivers to share data in real time. For instance, Motorola says in heavy traffic or any emergency that a passenger could encounter, the driver can send an emergency signal to central administration. This then allows dispatchers to know the exact location of the vehicle and take appropriate action.

1,000 radios in Jordan

 Sepura has been contracted to supply more than 1,000 radios to the security agencies that operate on Jordan's Special Communication Commission (SCC). Two models will be supplied: Sepura claims the STP9000 hand-portable has long been the choice of public safety users due to its enhanced battery life, full-duplex audio and IP67-certified casing; while the SRG3900 mobile offers 10W RF power which it says is the "greatest" operational range among TETRA terminals on the market today.

Hajj critical comms

 With an estimated 1.8m pilgrims making it to Mecca for this year's Hajj in September, reliable communications was essential. After strict evaluation and testing, the Ministry of Hajj and Umrah selected Hytera's DMR solution to replace its legacy system. It includes digital handheld radios, mobile radios, fixed station, repeaters and Smart Dispatch system. Hytera says TDMA technology applied on its radios doubles the frequency efficiency and includes a number of other features, such as Arabic support for messaging.

Budapest combats major incidents with TETRA

 To combat major incidents, Budapest will have a nationwide Unified Digital Radio Communication System (UDRS) with sophisticated "self-healing" functions. From December 2016, Airbus Defence and Space (ADS) will equip the UDRS in Budapest with the latest IP-backed TETRA technology as part of the nationwide modernisation efforts.

The programme will be implemented step-by-step. ADS, mandated by network operator Pro-M Zrt, is currently upgrading the country's radio communications infrastructure. It's claimed this will further increase the high availability of the country's mission-critical network.

Hungary's existing UDRS network (also called 'EDR') was delivered by ADS in 2006. It covers approximately 99 per cent of the country, and is used by public security agencies such as the police, border guards, fire service, disaster prevention, ambulances, armed forces and the security services.

After the modernisation, it's claimed Hungary's secure TETRA network will be one of the most reliable emergency communications systems in Europe. ADS says the upgraded network enables communications to remain operational in the event of disruptions or failures caused by sabotage. The network will leverage new software that will automatically re-route the



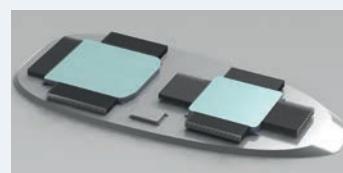
Budapest's emergency services will benefit from the new Unified Digital Radio Communication System rolling out across the city.

communications of a base station in the event of the primary connection being broken.

Intelsat sees "unprecedented performance" using small airborne flat-panel antenna

 Intelsat General has announced what's described as "unprecedented performance" in sending signals to and from one of its high-throughput EpicNG satellites using a small, flat-panel antenna designed for aeronautical applications by Gilat Satellite Networks (GSN).

GSN's terminal is designed for a new generation of small class III unmanned aircraft systems (UASs) that are coming into service for intelligence, surveillance and reconnaissance (ISR) operations,



The flat panel array is part of GSN's terminal designed for a new generation of small drones that are coming into service for intelligence operations.

and other non-military government and commercial applications. A series of tests were performed

using the company's BlackRay 71 airborne terminal which features a mechanically steered 6 x 6 inch flat panel array. Data was sent from the small antenna to the recently launched *Intelsat 29e* satellite at a rate of 3.9Mbps with an efficiency of 0.26 bits/Hz.

Intelsat says this compares to an uplink rate of about 1.8Mbps and efficiency of 0.09 bits/Hz achieved with a conventional Ku-band widebeam satellite. It adds that the link was effectively two times the rate and almost three times more efficient.

EC report finds insufficient 5G allocation

 Europe risks not having sufficient spectrum for 5G service providers to deliver potential economic benefits of EUR141bn and 2.3 million jobs if the conventional dedicated spectrum allocations per operator continues to be followed.

This is the headline finding of recent analysis from a team that included independent experts Real Wireless and published as part of the European Commission's landmark 5G socio-economic report.

In its 'Identification and quantification of key socio-economic data to support strategic planning

for the introduction of 5G' study, the EC forecasts the benefits, impacts and technical requirements for the introduction of 5G in Europe. In particular, it investigates what the technology might actually mean for users, industries, operators and other stakeholders.

The study focused on four sectors that are most likely to take early advantage of 5G: automotive, healthcare, transport and utilities. In addition, four different environments where the impact of 5G can be tested were identified: smart cities, non-urban areas, smart

homes and smart workplaces. By 2025, it is expected that EUR62.5bn will arise from "first order" benefits in the four verticals examined. First order benefits focus on the more direct advantages for the producers of goods and services.

"The socio-economic value of 5G will be found in its applications for vertical industries to an extent that no wireless technology has before," says Mark Keenan, CEO, Real Wireless. "However, many of those applications identified under the 5G vision are highly demanding, with significant spectrum requirements."

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