For communications professionals in north, west, east & central Africa

NORTHERN AFRICAN WIRELESS COMMUNICATIONS

AUGUST/SEPTEMBER 2018 Volume 17 Number 4

- Dealing with revenue leakage and mobile fraud
- Industry view: do you need next-generation Wi-Fi?
- How wireless tech is protecting people and rainforests


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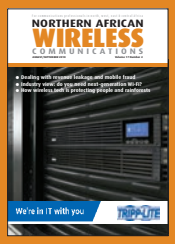

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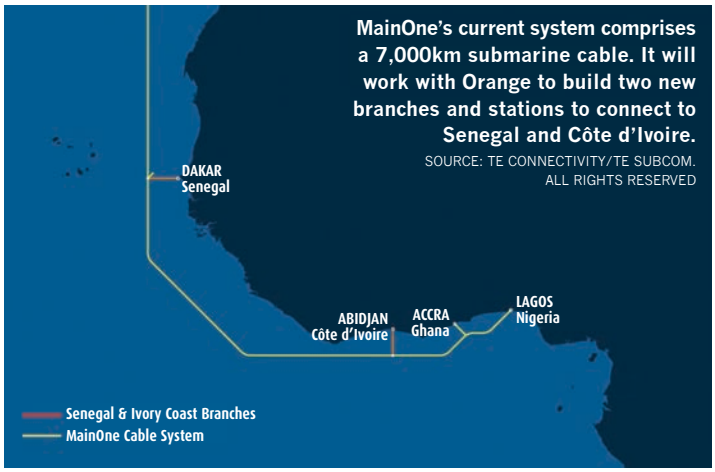
MainOne to extend subsea cable in West Africa with Orange support

MainOne Company will partner with Orange to extend its submarine cable system in West Africa.

MainOne's current system comprises a 7,000km submarine cable and was launched in 2010. Under its partnership with Orange, the company will build two new branches and stations to connect its system to Dakar and Abidjan. Orange will be the owner of the cable station in Dakar.

Orange Group subsidiary Orange Marine will manage the installation of the new branches. They will be lit using Ciena's transmission hardware and equipped with TE SubCom's *WSS* ROADM technology. It's claimed this allows MainOne and its partners to match the capacity in each branch to the market need, thus optimising cable utilisation. This is also said to be an industry first for the deployment of undersea spectrum-sharing in Africa.



MainOne's current system comprises a 7,000km submarine cable. It will work with Orange to build two new branches and stations to connect to Senegal and Côte d'Ivoire.

TE SubCom adds that the deployment will inject new technology that upgrades MainOne's system to a potential capacity of 10Tbps when it becomes operational around November 2019.

Following the launch, MainOne will have landing points in five markets – Nigeria, Ghana, Senegal, Côte d'Ivoire and Portugal, in addition to Cameroon. The company says a cluster of Francophone countries in West Africa that are experiencing an increased demand for advanced telecom services, including Burkina Faso, Mali and Mauritania, will also benefit from the extensions.

Kazeem Oladepo, MainOne's regional executive for West Africa, says: "This extension of our subsea cable to Senegal and Côte d'Ivoire will further open up their international bandwidth markets, drive down costs and ultimately boost the economic and commercial development of the region."

Meanwhile, Orange says it will benefit from greater capacity and additional bandwidth for the development of fixed and mobile data in Africa.

"More specifically, this cable extension is an opportunity to improve connectivity and offer a broader range of services for both Orange Côte d'Ivoire and Sonatel," states the company. "In addition, MainOne offers an alternative route that guarantees the protection of voice and data traffic passing through the other cables in the area – *SAT3/WASC/SAFE and ACE*.

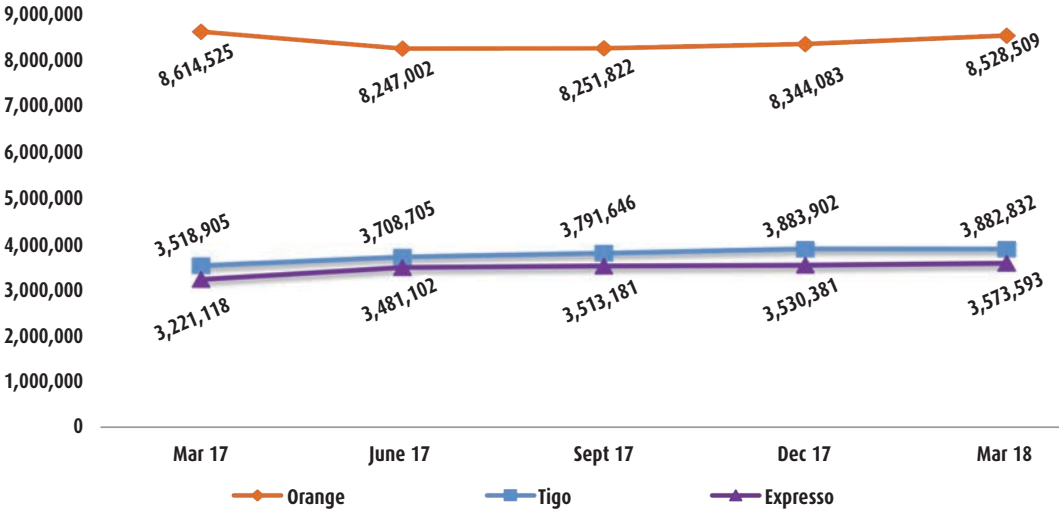
Sonatel to expand network after Senegal LTE-A launch

Sonatel has launched 4G+ in Senegal. As from October, all of the country's regional capitals and its most populated cities will be fully connected to mobile broadband internet. 130 sites are so far covered with 4G+, with more expansion expected in the rest of the country.

Sonatel says it spent the first half of this year strengthening its coverage in Dakar and commissioning 4G sites in Porokhane, Medina Gounass, Sokone, Darou Mousty, Popenguine and Vélingara. The operator says it has now deployed thousands of 4G technical sites throughout the country, with Touba, Thiès, Saint-Louis and Kaolack among some of the many cities that have been recently served. The aim is to cover all of the regional capitals by November 2018.

Sonatel is continuing to expand its overall network. Over the past three years, the operator says it has invested more than CFA220bn in technical equipment for its 2G, 3G, 4G and 4G+ mobile and transport networks.

As part of its commitment to the government's *Digital Senegal 2025* strategy, Sonatel says it is facilitating "affordable and high quality" internet access for as many people as possible. "This commitment is a response to the needs of our more than eight million customers in Senegal, to lower internet rates, and to extend and strengthen the quality of our mobile internet network to improve the customer experience on a daily basis," states the operator.



Number of mobile subscribers per quarter in Senegal. SOURCE: MOBILE TELEPHONY OBSERVATORY, ARTP, MARCH 2018

The Sonatel Group offers mobile and fixed services in Mali, Guinea, Guinea Bissau and Sierra Leone. It has been developing telecoms services throughout Senegal since 1985 and launched a GSM network in 1996. Following privatisation the following year, France Telecom (Orange) currently owns 42 per cent of the Sonatel in Senegal while the state retains 27 per cent. The rest is held by private investors and the company's employees.

According to figures from Senegal's regulator ARTP, the country had 15,984,934 mobile subscribers at the end of 1Q18. Sonatel/Orange leads with a market share of 53.35 per cent, followed by Tigo with 24.29 per cent and Expresso with 22.36 per cent.

Community networks are key to connecting the continent

Community networks provide a sustainable solution to address the connectivity gaps that exist in underserved urban, remote, and rural areas, according to the Internet Society. It also calls for regulators and policymakers to work more closely with communities to enable such networks.

In its *Spectrum Approaches for Community Networks* briefing document published last October, the society says a community network starts with a local group of people who want to bring communications to their local village or town, or who want to enable communications for other local services.

It says while these networks are often small in scope, usually serving communities under 3,000 inhabitants, some support more than one village or community. For example, The Spain-based guifi.net community network also has nodes in Africa, Asia, Latin America, and Portugal, and is estimated to serve more than 50,000 people.

The society says that despite internet access continuing to grow in Africa with more than 450 million people now connected, more than 60 per cent of the population still remains offline.

It adds that connectivity gaps are more prevalent on the continent, and that a recent survey identified 37 community network initiatives in 12 countries, of which 25 are considered active.

According to the organisation, the cost to deploy such networks can be low. Often, the technology required is just an inexpensive, locally available wireless router, with networks ranging from WiFi-only to mesh and mobile networks that provide voice and SMS services.

The Internet Society goes on to point out that policymakers and regulators can play a key role in ensuring innovative approaches to making spectrum available for community networks. These include the use of unlicensed frequencies, sharing licensed ones, as well as more innovative approaches, such as a "social purpose" license, for example. This is an exclusive service license granted in rural unserved or underserved areas to non-traditional network operators.

In its briefing document above, the society says: "With 'social purpose' licenses, regulators set aside specific licenses for non-traditional operators, which removes the competitive nature of licensing, and prioritises spectrum use for non-commercial purposes.

"For some of these social purpose licenses, many community network experts believe that reducing spectrum fees would greatly assist community network development in their regions."

Michuki Mwangi, the Internet Society's senior development manager for Africa, reckons enabling

Enabling communities to actually connect themselves is a ''new way of thinking,'' according to Michuki Mwangi, senior development manager for Africa at the Internet Society.

communities to connect themselves represents a "new way" of thinking. He says: "Policymakers and regulators should recognise that connectivity can be instigated from a village or a town and that they can help communities to connect themselves by providing an enabling environment with innovative licensing and access to spectrum."

Meanwhile in a separate announcement made towards the end of September, the Internet Society is partnering with Facebook to develop IXPs throughout Africa.

According to the society, 42 per cent of the continent's countries currently lack internet exchange points. Working with Facebook, it plans to increase and support the expansion of existing IXPs in Africa by promoting infrastructure development, training, and community engagement.

Kojo Boakye, head of connectivity and access in Africa at Facebook, says:. "Our partnership with the Internet Society will help develop Africa's IXP ecosystem by deploying resources like training and equipment to the areas where they are most urgently needed."

Citing data from the Africa IXP Association, the Internet Society says there are approximately 44 active IXPs located across 32 countries on the continent. This is said to have resulted in a 275 per cent growth of locally exchanged internet traffic since 2008 when there were only 16 IXPs in Africa. The society adds that over the last 10, traffic exchanged at African IXPs has increased from 0.16Gbps to 412Gbps with more than 800 networks now connected at these peering points.

"The internet community adopted the goal of having at least 80 per cent of the internet traffic consumed in Africa being locally accessible, and only 20 per cent sourced outside the continent by the year 2020,"explains Dawit Bekele, Africa regional bureau director for the Internet Society.

"We are getting closer to that target thanks to the many activities that promote interconnection and hosting in Africa, and to partnerships such as the one announced with Facebook."
Asteroid and NAPAfrica sign IXP cooperation agreement – Wireless Business, p14.

Safaricom hopes surveillance project will boost internet use

Safaricom has teamed up with the Kenya Alliance of Resident Associations (KARA) to increase security in housing estates with a pilot surveillance project launched in Ngei Estate phase 2, Langata, Nairobi County.

Through the partnership, Safaricom will sponsor a fibre connection and provide equipment that will be used for surveillance at the estate's two gates. The system will be fully powered by solar energy. Safaricom adds that the surveillance feed is accessible via an easy-to-use online portal that is supported by its cloud services.

Safaricom says that it has so far laid more than 5,000km of cable as part of its FTTH rollout. Customers who sign up for services benefit from free installation within 48 hours and a free router.

As part of the initiative, the company will also sponsor first aid and home safety training for a number of child caregivers on the Ngei estate.

Safaricom is keen to promote its FTTH and cloud services for applications such as home and housing estate surveillance. Steve Okeyo, the operator's director of regional sales and operations, says: "As we roll out Fibre to the Home in different parts of the country, we are looking to diversify our product offering and give customers a wide array of services."

Since announcing its FTTH initiative last year (*see News, Aug-Sep issue*) Safaricom says that it has now so far passed more than 200,000 homes with more than 5,000km of cable currently laid. It says customers who sign-up for services benefit from free installation within 48 hours, a free router worth KES10,000, and "unlimited fast and reliable" internet.

TCCA sets out options for TETRA and LTE to co-exist

Francesco Pasquali, chair of TCCA's TETRA Industry Group, says TETRA needs connectivity to other bearers, particularly LTE.

The TCCA (TETRA and Critical Communications Association) has set out options for what it describes as the "efficient co-existence" of LMR/PMR/LTE networks.

In its *TETRA Connectivity to LTE* white paper published in September, the association provides an overview of the different approaches to enabling TETRA/LTE interworking, with several methods described. The key issue addressed is interworking between the LMR/PMR and LTE worlds, particularly the interworking and evolution of PTT services, as group communications capability is the key service in LMR/PMR.

TCCA board member and chair of its TETRA Industry Group, Francesco Pasquali, says TETRA networks are expected to be operational for many years to come. He says: "TETRA will therefore need connectivity to other bearers, particularly LTE, to facilitate long-term co-existence, safe migration from TETRA to LTE or as a hybrid communications solution."

The TCCA says there will be a standard available for interworking between TETRA and LTE that will meet the needs of critical communications users in the 2019 timeframe. But that standard will then need to be converted to products and implemented in LTE networks. The association believes that through using standards-based approaches, users will have the benefit of open competitive markets for their solutions and the ability to use products from different suppliers.

It adds that for those that need solutions now, there is a range of company-specific proprietary solutions that will give various levels of interworking and may in time conform to new standards.

"The deployed commercial LTE systems deliver very good, but best effort, service until hardened, updated to the latest 3GPP Release, and potentially having their area coverage expanded," states the TCCA.

3GPP has started standardisation work on the LMR/PMR/LTE interworking functions in Release 15, and the TCCA expects to have this functionality specified in Release 16 which is currently planned for completion by December 2019.

The TCCA goes on to point out that for interworking with another technology, 3GPP can only standardise half of the solution, and work is therefore in progress in ETSI Technical Committee TCCE (TETRA and Critical Communications Evolution) to standardise the equivalent functionality needed by TETRA to achieve a workable solution.

It says that with there being a "significant" gap between the release of standards and the availability of the associated functionality in products for operational use, it is not expected that there will be a full range of 3GPP compliant interworking solutions deployed until 2021/2022.

David Sumi, Vice president of marketing, Siklu Communications

ON THE NETWORK

Riding the wave for multi gigabit connectivity

Wireless solutions are the obvious choice to extend fibre where it doesn't exist. But until recently, wireless technologies did not have the capacity or were too expensive.

Unlike traditional legacy wireless operating in the congested sub-6 band, mmWave (mmW) is different. It is either 'V band' (unlicensed frequencies at 60GHz) or 'E-band' (70/80GHz, lightly licensed).

Recently, there has also been a lot of talk about 5G and mmW in the 28GHz and 38GHz bands. Despite the promotion by Tier 1 carriers who own these licenses, these bands only offer total available spectrum of 1 to 3GHz which is not enough to deliver the gigabit/sq. km. customers are demanding. Often, the solution is to use higher modulation rates such as 256QAM, but this has a major impact on the range and reliability of the links.

E-band is reserved for point-to-point (PTP) operations, supports ranges of several kilometres, and has a total of 10GHz available for deployment. V-band offers 11GHz to 14GHz of spectrum. When combined, this spectrum supports large channel sizes of 1GHz or more and can be used with more robust modulations such as QPSK, delivering capacity, reliability and distance.

For PTP products utilising 70/80GHz, the story gets even better. With beam widths as sharp as 0.5°, multiple links can be deployed on the same channel in close proximity. This narrow beam property, coupled with the massive amount of spectrum, means deployments can be virtually unlimited.

Outlay? 10 years ago, a 1Gbps mmW link might cost USD20,000. Today, vendors are offering 10Gbps full duplex links for roughly USD10,000.

Vodacom launches Africa's first commercial 5G service

On 25 August, Vodacom Group announced the continent's first standards-based, commercial 5G service.

Its subsidiary in Lesotho is using 3.5GHz spectrum to initially deliver fixed wireless access broadband services to two enterprise customers.

While the operator has not named the companies involved, a spokesperson said: "[They are] two major customers in the mining and banking industries who were chosen due to their relative size and influence in the country. We are working closely with them to deploy the service based on their requirements." No further details about the number of users involved or what devices they are using were revealed.

Vodacom Lesotho said the immediate benefit of 5G technology for its subscribers includes the quicker deployment of broadband services with "fibre-like" speeds. The company added that with early access to the technology, entrepreneurs and the government will be able to work with it to develop and incubate innovative applications to power digital transformation in the country.

Meanwhile, the group is claiming another 5G first, this time in South Africa with the deployment of the same standards-based technology as used in Lesotho. This followed Vodacom being granted a temporary spectrum license of 100MHz in the 3.5GHz band to showcase 5G network capabilities in South Africa.

According to the operator,

Vodacom Group CTO Andries Delport presents the speeds achieved in the South African trial. The tests were conducted over a live 5G mobile network in Midrand and independently evaluated by test experts MyBroadband and Ookla.

3.5GHz spectrum is considered optimal for 5G deployments due to its suitability for throughput and capacity. It added that the frequencies are not dependent on the digital migration in South Africa, and that they also have adequate indoor penetration characteristics to support a broad range of applications such as smart factories, augmented reality and autonomous vehicles.

Vodacom South Africa has deployed advanced 5G Massive MIMO to provide improved spectral efficiency and coverage, enabling increased network capacity. It said its network is delivering speeds in excess of 700Mbps and latencies of less than 10 milliseconds. The company said it will exceed 1Gbps as new software versions and devices become available.

Under an MoU signed late last year, the operator is using Nokia's products to test 5G in South Africa (*see News, Jan-Feb 2018*). But the 5G network will not be available to customers in South Africa until 3.5GHz spectrum becomes available in the country.

Vodacom Group CEO Shameel Joosub said: "What we've accomplished in Lesotho is an example of what can be achieved in Africa, should the requisite spectrum also be made available. Vodacom will be able to make 5G services available to its customers in South Africa once requisite spectrum is assigned.

"Global technological advancements are evolving at a rapid pace and South Africa can't afford to be left behind, particularly when we look at some of the potential use cases for 5G to support critical sectors of our society such as healthcare and education."

A Vodacom spokesperson also said 5G rollouts in other group operations on the continent would depend on the different infrastructural requirements and the available spectrum in each country.

With this latest announcement, Vodacom has stolen a march on its rival MTN which also started trialling 5G at the beginning of 2018 following an agreement signed with Ericsson at *AfricaCom* last November (*see News, Jan-Feb 2018*).

Intersat promises affordable connectivity

African regional VSAT services provider Intersat and satellite operator RascomStar will work together in an effort to offer affordable broadband connectivity across the continent.

The partners claim their strategic deal will see new Ku-band services launched at "ultra-competitive" prices across Africa.

Intersat has an administrative base in Dubai as well as regional headquarters in Nairobi. The company also says it has an established reseller and partners network in 32 African and several Asian countries.

As part of this latest agreement, Intersat will provide fully managed services from what's described as its "state-of-the-art" teleport facilities in Belgium. The company will use its iDirect hub to connect SMEs, NGOs, government, academic and financial institutions throughout Africa to the cloud.

Meanwhile, RascomStar will supply capacity via its *RQ1R* satellite which orbits at 2.9°E and is said to provide "unique" Ku-beam coverage across the continent.

Intersat reckons that its partnership with RascomStar demonstrates that it can readily adopt technologies to support its mission of providing affordable satellite connectivity in the region.

The company's CEO Hanif Kassam adds: "In rural and underserved areas, VSAT is the best and quick-deployable solution for broadband access, helping in bridging the digital divide in Africa."

VSAT market "may be improving", says C-COM

C-COM Satellite Systems reckons Africa's VSAT market may be looking up following orders worth around USD1.28m for its *iNetVu* antenna systems from various customers across the continent.

The Canada-based vendor says the systems have been purchased by several reseller partners in the region, and will be deployed by governments, military users and commercial customers in the banking and broadcast sectors.

"While C-COM has been active in Africa for a number of years, the mobile VSAT market has been slow to develop for economic reasons," says Drew Klein, C-COM's director of business development. "These significant orders, from both new and existing C-COM integrators based in Africa, are an indication that market conditions in the region may be improving, and that highly reliable and cost-effective auto-acquire antennas like the *iNetVu* products are of high value."

C-COM expects to deliver these orders over the next few months.

The company adds that it has more than 20 different Comm-on-the-Pause antenna models integrated with all major VSAT modem manufacturers and approved with most major satellite operators. It is also working closely with more than 500 active dealers in more than 100 countries.

Furthermore, C-COM is working with a research team at the University of Waterloo and developing an electronically steerable, Ka-band flat panel antenna system based on phased array technology (*see Wireless Solutions, Jun-Jul issue*). It reckons this has the potential to "revolutionise" satellite's addressable market in all mobility markets.

Satellite-based mobile banking in Africa using C-COM antennas.

Successful launch for Azercosmos

Azerbaijan's state-owned satellite operator Azercosmos has successfully launched its second satellite for Africa with the help of Intelsat. *Azerspace-2/ Intelsat-38* left Earth on board an *Ariane 5* launch vehicle from Kourou, French Guiana on 26 September. Azercosmos will use *Intelsat-38* to offer services as *Azerspace-2* to meet the growing demand for DTH television, government and network services in sub-Saharan Africa, the Middle East, central and South Asia, as well as Europe. The satellite will orbit at 44°E and also provide Ku-band connectivity to Africa.

4.5G paves way for 5G

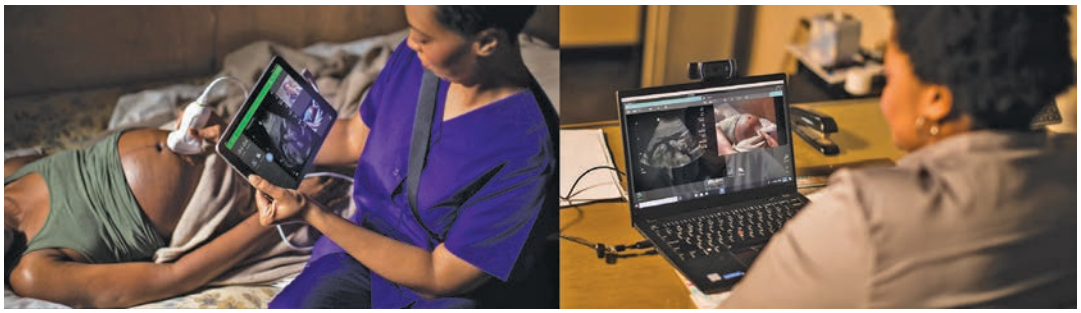
Moroccan cellco Inwi claims to have established the country's first mobile connection with a bitrate of 1Gbps. In early September, the company announced that its ongoing network improvement will enable it to switch to full 4.5G by the end of the year and cover 94 per cent of the population. Inwi is working with Huawei and said its 4.5G network will be deployed gradually in several sites, cities and regions across Morocco. It added that this will then pave the way to a future transition to 5G.

Liquid joins Sigfox's IoT

Kenya is among five new countries that have joined Sigfox's global network. The IoT service provider will partner with Liquid Telecom to deploy and operate its network in the country. Sigfox says that by expanding the network infrastructure to provide national coverage and accelerating adoption through working with startups and students, Liquid will play a key role in the development of Kenya's IoT industry. The addition of Kenya along with Austria, Lichtenstein, Romania and Norway bring the total number of countries currently in Sigfox's partnership to 50. In Africa, they also include partners in Mauritius, Reunion, South Africa and Tunisia.

AfricaCom turns 21

The organisers of *AfricaCom* have announced details for this year's event which celebrates its 21st anniversary. KNect365 says that over the three-day conference and exhibition, more than 30 thought-leaders will "advance the conversation" around Africa's digital transformation through a series of expert sessions. This year's speaker line-up includes MTN CEO Rob Shuter, Telkom's group executive for regulatory affairs Siyabonga Mahlangu, among many others. *AfricaCom* takes place in Cape Town from 13-15 November. *tmt.knect365.com/africacom*



Lumify features a cloud-based collaborative platform that brings experts into an ultrasound exam, no matter the distance, as though they were in the same room

Philips launches app-based portable ultrasound system

Philips Africa has launched *Lumify*, its first app-based ultrasound system that promises to extend the reach of ultrasound applications to a broader network of healthcare providers using mobile technology.

Unveiled in Nairobi in mid-September, Philips says the system is an "entirely new way" of delivering ultrasound technology to healthcare providers and their patients.

Lumify is claimed to offer high-quality imaging on a compatible smart device through a subscription model. The device connects to a Philips' ultrasound transducer, and users also have access to an online portal where they can manage their equipment and access support, training and IT services.

As a customised app-based solution, Philips says its system is designed to "seamlessly" integrate with patient profiles and health system equipment using cloud-enabled technology.

First-generation *Lumify* transducers are now commercially available across East Africa. They include: the *L12-4* which supports a variety of clinical applications, including soft tissue, musculoskeletal, lung and vascular scanning; the *C5-2* which offers abdominal with lung and gallbladder pre-sets and Ob/Gyn capabilities; and the *S4-1* which has presets for cardiac and FAST exams. All the applications and services are available through Philips' new app-based portal.

"*Lumify* is designed to drive transformation in care delivery and digital health – a dynamic combination that can extend the reach of ultrasound in a remarkable way," says Philips Africa CEO Jasper Westerink. "Clinicians as well as family doctors at small outpatient clinics can perform scans themselves, speeding up the diagnosis process and possible treatments."

The system also features Innovative Imaging Technologies' *Reacts* collaborative platform. This connects clinicians around the world in real-time by turning a compatible smart device into an integrated tele-ultrasound solution, combining two-way audio-visual calls with live ultrasound streaming.

According to Philips, this easy-to-use and innovative integrated system enables clinicians to have a face-to-face conversation with colleagues. They can switch to the front-facing camera on their smart device to show the position of the probe, and can then share the ultrasound stream so that both parties are simultaneously viewing the live ultrasound image and probe positioning, while discussing and interacting at the same time.

In addition to clinicians seeking virtual guidance, Philips reckons *Lumify* with *Reacts* will also be a valuable tool for teaching institutions, emergency medical service providers, disaster relief providers and hospitals with satellite clinics.

Nexttel to expand fibre in Cameroon with Gilat Telecom

Gilat Telecom (formerly Gilat Satcom) has been chosen by Nexttel to provide 4G broadband services in Cameroon.

Part of Vietnam's Viettel Group, Nexttel has operated in Cameroon since 2015 and is now said to have around five million subscribers which puts it ahead of Camtel but third after Orange and MTN.

Nexttel will be using Gilat Telecom's fibre network both within Cameroon and across Africa in a bid to provide a fast and reliable broadband service. Gilat says it was chosen after a competitive tender that included a number of established wholesale carriers in Africa.

CEO Dan Zajicek says: "We are investing heavily in our infrastructure across Africa and this is enabling us to win large customers like Nexttel."

As well as its established wholesale business, Gilat Telecom says it has built data centres across the continent with both public and its own cloud services supported in its POPs in Ghana, Nigeria, Uganda and Zambia. It also operates ISPs in Uganda and Zambia.

From left to right: Nexttel VP Moise Bay; Arik Zenouda, West Africa sales director for Gilat Telecom; and Nexttel chair, Baba Amadou Danpullo.

Digital payments adoption drive across Africa

EcoCash Scan & Pay uses Mastercard's QR system to enable customers to pay for merchant goods directly from their mobile money accounts.

Mastercard has launched what's claimed to be a simple, secure and instant mobile payments solution as part of its efforts to reduce cash usage and increase digital financial inclusion across the continent.

It has recently launched a system with EcoCash in Zimbabwe. Powered by Mastercard's *Masterpass QR* system, *EcoCash Scan & Pay* enables subscribers to pay merchants directly from their mobile money accounts. All the customer needs to do is use a smartphone to scan a QR code displayed at the checkout, or enter a merchant identifier associated with the QR code into their feature phone.

The companies say the technology removes the need to carry cash, and frees both consumers and retailers from the costs, security risks and inconveniences associated with cash.

Scan & Pay is currently available to EcoCash's five million active subscribers, and is already accepted at 3,800 retail locations and businesses in Zimbabwe.

According to Mastercard, SMEs contribute more than 60 per cent of the country's GDP, yet only a fifth are served by formal financial institutions. With a large proportion of SMEs still transacting using cash, it reckons *Masterpass QR* provides a cost-effective, fast and easy-to-deploy solution, enabling these businesses to safely accept digital payments.

Gabriel Swanepoel, VP of business integration at Mastercard Southern Africa, says: "*Masterpass QR* is a game-changer as it enables smaller retailers to increase sales, draw new customers into their stores, and open-up new commerce channels with little to no investment."

Mastercard's system can be used at any supported location across Africa. It was first launched on the continent in Nigeria in September 2016 following a partnership with the Ecobank Trans International Group. Since then, *Masterpass QR* has also been rolled out in Rwanda, Tanzania, Uganda, Ghana, Kenya and now Zimbabwe. Mastercard has previously stated that its global goal is to connect 40 million micro and small merchants to its electronic payments network by the end of 2020. By then, it says *Masterpass QR* will have been introduced to 33 countries across Africa.

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Enabling Latency-Sensitive IoT Applications

The growth of the Internet of Things has reached a tipping point. Costs are lower, technology has matured, devices are smaller, and our ability to capitalise on collected data has increased. IoT is no longer just a buzzword – it is a significant business driver.

Management consulting firm McKinsey & Company estimates that IoT will have a yearly economic impact up to ZAR 158 trillion (USD 11 trillion) by 2025 – more than 10 percent of the world economy. The average consumer may think of smart home devices when considering IoT, but home applications account for less than three percent of that estimate. Commerce, industry, government, transportation, and applications outside the home account for the majority.

For home applications, IoT devices typically communicate with the cloud over a wireless LAN and the public Internet. For mission-critical commercial and industrial applications, however, the cloud or core data centre may be too far away from the point of data generation. The response time of the cloud seems fast to human beings, but latency can cause poor performance or make an application unworkable.

The most feasible and cost-effective solution for reducing latency to acceptable levels is usually to install essential data processing resources in an edge node, either on-site or nearby. This edge node, also called a fog node, might be one server in a wall-mount rack or an entire self-contained micro data centre. The edge node still communicates with the core data centre, but time-sensitive data processing takes place closer to the point of data collection, and latency remains within tolerance.

Tripp Lite's Edge

Tripp Lite is a leader in providing edge computing infrastructure, with a strong presence in more than 80 percent of Fortune 500 companies. IT and communications professionals worldwide choose Tripp Lite for reliable and cost-effective IT infrastructure solutions in installations of all sizes. Key Tripp Lite infrastructure solutions for edge nodes include racks, PDUs, UPS systems, KVMs, cables, and cooling.

Working with an experienced partner is essential to optimising an edge installation. Edge sites typically have a small footprint available, so solutions must maximise server density without compromising reliability. Edge nodes may also be located in rugged industrial locations not originally intended for IT equipment, requiring special rack cabinets and other measures. Tripp Lite can even customise rack solutions to fit the site, the application, and the environment's specific challenges.

In addition, remember that edge nodes are not near the core data centre by definition. IT staff are less likely to be on-site, so remote management is important to ensure reliable operation and avoid downtime. In the case of a PDU, being able to monitor loads over the network is a tremendous time- and cost-saver. Even better, some PDUs allow remote outlet control, so an IT manager can reboot an unresponsive server without making a trip.

When you choose Tripp Lite to provide infrastructure for mission-critical applications, our experienced application specialists can help customize a solution to fit your unique requirements. We evaluate the environments and provide actionable recommendations to ensure solutions provide the availability, manageability, efficiency, and affordability you need to meet technology goals on schedule and within budget. Our experience providing solutions to micro data centre and small data centre clients makes it the perfect source for any infrastructure.

"Tripp Lite understood our needs and worked closely with us to ensure those needs were met."
– AMD Engineering Services Group Manager Frank Spagnuolo

We're in IT with You!

Choosing the right IT solutions is important, but the company behind them is even more important. When you make an IT infrastructure investment, you may need it to last 10 years or more. Tripp Lite is a long-established partner you can rely on to stand behind your investment and provide the expertise, experience, and personalised service you deserve for years to come.

Learn how Tripp Lite can help you with your next project!

Call: +254.731.137.202
Email: salesint@tripplite.com
Visit: www.tripplite.com

Joint venture to provide satellite broadband services across Africa

Hughes Network Systems and Yahsat have agreed to form a new joint venture to provide commercial Ka-band satellite broadband services across Africa, the Middle East and south-west Asia.

The two companies plan to work together to provide unserved and underserved communities with reliable, high-speed internet services.

While Hughes has bought a 20 per cent stake in the joint venture for USD100m, Yahsat has not disclosed the value of its investment.

Yahsat will provide capacity from its *Al Yah 2* and *Al Yah 3* satellites – the latter finally began commercial services in July following a problematic launch at the start of the year (*see News, Dec 17-Jan 18 issue*). Yahsat said the satellite was already supporting MVNO users and five new markets, and that the impact of the delay was covered by its insurance agreement. The company did not reveal any further details or figures here.

The satellites will leverage Hughes' *JUPITER* system which is designed to optimise large scale high-throughput satellites. The company will also supply its OSS/BSS platforms.

Initially, the venture will focus on direct-to-premise services to homes and SMEs, and to community centres and schools that are served under local government programmes.

In parallel, the two companies said there will be an increased focus on community hotspot solutions to make satellite-enabled broadband more accessible to many more users across the footprint covered by Yahsat's two satellites.

In addition, the partners say their venture will also aim to capitalise on the "accelerating transition" towards Ka-band based backhaul and carrier solutions from mobile network operators.

Completion of the transaction is subject to customary regulatory approvals and closing conditions, and is expected to occur later this year.

Yahsat CEO Masood M. Sharif Mahmood reckons his company's track record and experience in operating the *YahClick* broadband service, combined with Hughes technology and experience, are a "winning proposition to unlock the mass market potential of satellite broadband services across the region".

When asked if this latest partnership affects Yahsat's deal with Eutelsat and its *Konnect Africa* initiative (*see News, Feb-Mar 2017*), Mahmood said the deal was still live and that Eutelsat remained an "important customer".

Mobile money is big business for Orange

Orange says mobile money is now one of its top growth drivers in Africa.

This year marks the 10th anniversary of *Orange Money* which was first launched in Côte d'Ivoire. Since then, the operator says the service has been rolled out across 17 African countries and currently has around 40 million customers. It claims *Orange Money*'s "accelerating" growth and sales rose 60 per cent from 2016 to 2017, and that the value of transactions carried out on the platform reached EUR26bn last year.

As a result, Orange says mobile money is now one of the group's top growth drivers in Africa, particularly in Côte d'Ivoire, Mali, Burkina Faso, Senegal and Cameroon. In some countries, it says the service gives close to 50 per cent of users access to banking services in areas with low levels of bank usage.

The company is now expanding its platform by offering lending and savings services directly via mobiles. As part of an initial launch in early 2018, these services are currently available through partners to Orange customers in Mali and Madagascar.

Orange adds that international transfers are another strong area of development.

Avanti signs Master Distribution Agreements for HYLAS 4

Avanti Communications has signed two separate contracts for the distribution of services using its new *HYLAS 4* high throughput satellite in Africa.

In early August, the operator announced a "Master Distribution Agreement" (MDA) with iWayAfrica to provide satellite broadband services across the sub-Saharan region. Under the agreement, iWayAfrica says it will provide "affordable" high-speed satellite broadband to connect homes, SMEs, schools and enterprises, especially in rural and remote locations where terrestrial networks are limited.

iWayAfrica says it has a presence in more than 44 African countries on the continent as well as regional offices for all its wholesale services in Ghana, Kenya, Mauritius and South Africa. It already deploys Avanti's Ka-band services in Eastern and Southern Africa via *HYLAS 2*. With *HYLAS 4*, the company says it will be able to extend its Ka-band offering into new countries across West and Central Africa.

In a separate MDA signed towards the end of August, COMSAT will also benefit from Avanti's satellite fleet, particularly *HYLAS 4*. The company, which provides satellite connectivity to the US Department of Defense, says its seven-year agreement with Avanti will enable it to offer "advanced" and comprehensive service packages to customers, with a focus on Africa and the Middle East and on particular high-value deployments currently planned or under way.

For Avanti, the deal means gaining immediate access to US global governmental and military clients that would have otherwise taken several years to gain approval to serve. CEO Kyle Whitehill says: "Our partnership with COMSAT is disruptive in the most positive way. It takes us into new markets, with our highly capable satellite fleet paired to a global leader in satcom innovation."

Launched in early April, *HYLAS 4* features four uniquely steerable HTS beams and a further 64 fixed beams to expand capacity over East and all of sub-Saharan Africa, provide new capacity across West and Central Africa, as well as offer coverage of Europe and Latin America.

Meanwhile towards the end of September, Avanti announced that it had signed a seven-year wholesale capacity lease agreement for its *HYLAS* fleet with what it says is a "major" international satellite service provider. Avanti did not name its customer but said the deal is worth USD84m over the period of the agreement which is expected to begin in the third quarter of its next financial year which ends 31 December 2019.

SatADSL secures further deals for its cloud-based platform

A new partnership between SatADSL, iSAT Africa and APT Satellite promises to offer affordable broadband across Africa.

Under the deal, VSAT services provider SatADSL will provide its *Cloud-based Service Delivery Platform* (*C-SDP*) to enable iSAT to offer new products including voucher services, VNOFlex and congestion-based services.

APT will provide capacity via *APSTAR-7* located at 76.5°E. This covers Africa and the Middle East with C- and Ku-band services, and also includes Asia, Europe, Australia and China in its footprints.

iSAT is the latest service provider to connect to the *C-SDP* which, says SatADLS, is now being used by 77 Africa-based partners.

In a separate deal, Marlink will also use the platform to extend voucher-based and congestion-based services to customers.

For SatADSL, the agreement enables it to link directly to Marlink's technology platform to provide high bandwidth C- and Ku-band VSAT services across its coverage footprint.

"By securing this partnership and combining our C-SDP with Marlink's expertise, we will be able to provide our breadth of services worldwide for the first time," says Michel Dothey, CCO and co-founder of SatADSL. "This will open up our services to new markets, helping to bridge the digital divide by providing cost-effective satellite solutions in areas currently underserved by terrestrial networks."

These latest signings for SatADSL's cloud platform follow agreements with Global Telesat and RascomStar announced earlier this year (*see News Apr-May issue*).

Asteroid and NAPAfrica sign IXP cooperation agreement

Asteroid and NAPAfrica have signed an MoU to work more closely and collaborate on developing African internet interconnection.

Their agreement focuses on promoting peering and local interconnection, with an emphasis on IXPs as an essential part of the internet ecosystem.

Netherlands-based Asteroid operates neutral IXPs worldwide and has partnership agreements with other operators to deliver local interconnection. Meanwhile, NAPAfrica runs IXPs in South Africa and says it has more than 500 networks connected.

This MoU highlights the commitment of both parties to not just collaborate, but to also share knowledge and experience with others in the region about the advantages of Internet eXchange Points and peering.

NAPAfrica and Asteroid believe in promoting local peering and building strong local communities, and see their role in educating and spreading awareness of local interconnection, as one that fits well within their missions.

Community building and sharing of best practices has proven to be fundamental in improving local peering and creating successful IXPs. Nurani Nimpuno, CCO at Asteroid. "We believe that Africa holds great potential for Internet growth, but there are still real challenges to solve in terms of in-country interconnection. IXPs can play a key role in boosting that, and at Asteroid we want to play a positive role in that development. NAPAfrica with their amazing reputation and experience is an obvious partner for us to work with."

ThinKom partners with Telesat and SES to test Ka-band phased array antenna system

ThinKom Solutions and Telesat will jointly develop a Ka-band enterprise user terminal for Telesat's planned low Earth orbit (LEO) constellation of satellites.

As an initial step in the process, ThinKom's *ThinAir Ka2517* phased array antenna system will be used for over-the-air testing on Telesat's phase 1 LEO satellite over the next few months. Telesat hopes this will validate that ThinKom's Ka-band aero antennas, which currently operate on geostationary satellites, meet all of its LEO system requirements.

The two companies will then collaborate on the development of a new Telesat LEO-compliant enterprise terminal for terrestrial applications. They claim the new terminal will be "cost effective" while delivering "high-performance" connectivity for applications including mobile backhaul, Wi-Fi hotspots, isolated cable and DSL networks, and remote institutions.

According to ThinKom chairman and CTO Bill Milroy, his company's patented phased-array architecture provides rapid switching speeds without the drawbacks typical of electronic scanning antennas in terms of limited instantaneous bandwidth, poor low look-angle performance, high power consumption and lower aperture efficiency.

He says: "Our proven antenna technology has the versatility to support an integrated LEO constellation solution offering gap-free pole-to-pole coverage with automatic beam switching, rapid outage recovery and network optimisation for different geographical regions. This means we can offer a fast-track path to commercialisation of a fully interoperable, multi-orbit solution in the near term."

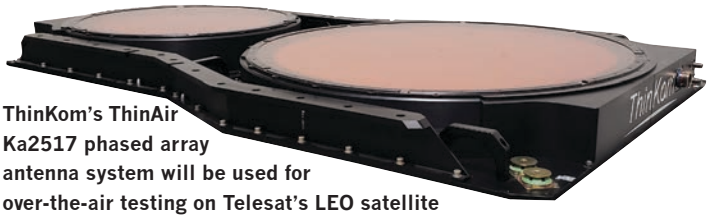
Canada-based Telesat's existing space fleet consists of 16 geostationary satellites but in January 2018 it launched a phase 1 LEO satellite that is currently undergoing commissioning and orbit-raising.

The company says its LEO constellation will offer a low latency, high throughput global broadband service with an initial constellation of around 120 satellites planned by 2021. It claims this will deliver an "unsurpassed" combination of capacity, speed, security, resiliency, latency and low cost. It goes on to boast that its constellation will accelerate 4G/5G expansion, and bridge the digital divide by bringing fibre-like high-speed services into rural and remote communities.

"ThinKom's new terminal, combined with the revolutionary value proposition of Telesat's LEO constellation, will unlock new satellite communications market

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
19/7/18	Kjell Morten Johnsen	VEON	Group CEO	VEON	Head of major markets
19/7/18	Christopher Schlaeffer,	–	–	VEON	Group chief commercial & digital officer – resigned
19/7/18	Mark MacGann	–	–	VEON	Group chief corporate & public affairs officer – resigned
21/7/18	Stephane Duproz	Africa Data Centres	COO	Global Switch	Group director for Europe
1/8/18	Bill Venter	–	–	Allied Electronics Corporation (Altron)	Non-executive director & company founder – retiring
5/8/18	Ali Al Hashemi	Thuraya	CEO	–	GM, Yahsat government solutions – will continue in this role following the completion of Yahsat's controlling stake in Thuraya
5/8/18	Ahmed Al Shamsi	Thuraya	Advisor to CEO	Thuraya	CEO
5/8/18	Marcus Vilaça	Thuraya	CTO	–	Also continues his role as Yahsat CTO
5/8/18	Shawkat Ahmed	Thuraya	CCO	Yahsat	CCO & advisor to CEO
4/9/18	James Frownfelter	ABS	CEO	ABS	Will also continue role as board chairman. Joined ABS in 2010 after serving as president & COO of Intelsat
4/9/18	Sam Wong	ABS	President & CFO	ABS	CFO
4/9/18	Dee Schwalb	ABS	COO	ABS	EVP of business development
4/9/18	Carmen Gonzalez–Sanfeliu	ABS	CCO	Intelsat	Regional VP of Latin America & Caribbean
4/9/18	Stephen Salem	ABS	General counsel	Aerojet Rocketdyne	Deputy general counsel
4/9/18	Ron Busch	ABS	EVP, network services	ABS	VP, network services
4/9/18	Justin Derksen	ABS	SVP, business development	Morgan Stanley	Executive director, media & communications investment banking team
4/9/18	Patrick French	ABS	SVP, global business development	ABS	VP, global business development
4/9/18	Jason Miller	ABS	VP, sales support & market research	Intelsat	Head of business development, Asia Pacific
10/9/18	Jean-François Fontaine-Boullé	Cambium Networks	Director of hospitality sales – EMEA	Quadriga Worldwide	Global accounts director



ThinKom's ThinAir Ka2517 phased array antenna system will be used for over-the-air testing on Telesat's LEO satellite over the next few months. Aero terminal connectivity has already been successfully demonstrated using SES' O3b MEO satellites.

opportunities with better value economics for service providers and their customers," says Michel Forest, director of engineering, Telesat. "Easy to deploy, cost effective, and agile beam antenna technology are key requirements for our Telesat LEO constellation, which will be able to allocate bandwidth seamlessly and instantly where it's most needed."

In August, ThinKom completed the first ground test of its *Ka2517* antenna. The demo took place at the company's facility in California in collaboration with SES subsidiary O3b Networks.

The test involved a *Ka2517* aeronautical antenna mounted on a vehicle that was used to acquire successive O3b MEO satellites at a 13° elevation. ThinKom says its antenna successfully tracked the satellites for 30-minute periods as they traversed from west to east.

ThinKom said the test is a precursor to a flight test, expected to take place before the end of this year. This will be the first in-flight demo of the company's antenna communicating through a non-geostationary constellation and aims to show the ability of the system to auto-track and perform seamless beam switching through aircraft roll, pitch and yaw motions.

Nokia expects to earn EUR3 for each 5G mobile phone

Nokia says the licensing rate for mobile phones that use its 5G SEP standard essential patents (SEPs) portfolio will be capped at EUR3 per device.

In a press statement issued in late August, the company described itself as a "long-term innovator" in the development of fundamental technologies for wireless communications, and said it has made "significant" contributions to the development of related standards for more than two decades.

According to Nokia, this R&D investment has resulted in a significant portfolio of SEPs which it has committed to license on FRAND (fair, reasonable and non-discriminatory) terms, in line with the applicable IP rights policies of relevant standard setting organisations.

"Our innovation continues in 5G, where significant parts of the emerging 5G standards will be based on Nokia innovations, and Nokia expects to have a significant position in SEPs once the standards are finalised later in 2018," stated the firm.

Beyond mobile phones, Nokia believes that there will be an "unprecedented" variety of end user devices that will use its innovation.

For these other categories of devices, the company said it will determine its licensing rates separately and will engage in dialogue with relevant industry participants to define the models best suited for those industries.

Mobile ecosystem to add USD150bn to the economy of Sub-Saharan Africa

More than half the population of sub-Saharan Africa will be subscribed to a mobile service by 2025, according to the GSMA.

In *The Mobile Economy: Sub-Saharan Africa 2018* report published in mid-July, the association forecasts that there will be 634 million unique mobile subscribers across the region in the next seven years. It says this is equivalent to 52 per cent of the population and is an increase from 44 per cent (44 million subscribers) at the end of last year.

However, while sub-Saharan Africa has been the world's fastest-growing

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
18/7/18	Ericsson	Sweden	2Q18	SEK	49.8 (bn)	NA	-0.58	Sales as reported & sales adjusted for comparable units and currency both decreased by -1% YoY. MEA sales declined slightly YoY. Networks sales were negatively impacted by monetary restrictions in a few markets in the Middle East; decline partly offset by growth in Digital Services. Overall Networks segment showed sales increases of 2% YoY, with strong growth in North America.
24/7/18	Vodacom Group	South Africa	2Q18	ZAR	20,653	NA	NA	Group service revenue growth, excluding currency translation effects, up 5.2% (reported up 4.2%). Added 2.5 million customers during the quarter, 1.5 million in South Africa & one million in international operations to reach 76.5 million across the group – a YoY rise of 10.3%.
26/7/18	Nokia Corporation	Finland	1H18	EUR	5.3 (bn)	NA	0.03	On a constant currency basis, net sales down 1%. Results consistent with company's view that the first half of the year would be weak followed by an "increasingly robust" second half.
26/7/18	SES	Luxembourg	1H18	EUR	981.4	621.1	0.45	0.5% decline in reported revenue at constant forex. CEO Steve Collar said: "We have delivered a strong first half of 2018, fully in line with our expectations & continuing our momentum from the first quarter. It is pleasing to see that our underlying revenues are growing again, fuelled by sustained performance from our Networks business & in particular from our aeronautical & government customer segments."
31/7/18	Intelsat	US	2Q18	USD	537.7	408.5		Results represent net loss of $46.8m for the quarter. Network services revenue was $198.5m (37% of total revenue), a decrease of 8% compared to 2Q17. But revenues from Media and Government divisions were both up at five & 15% respectively compared to 2Q17.
1/8/18	Eutelsat	France	FY17-18	EUR	1,408	1,076.09	NA	Revenues down 1.9% like-for-like (-4.7% reported). Konnect Africa project remains on track for commercial launch in August 2018.
2/8/18	Motorola Solutions	US	2Q18	USD	1,760	NA	1.05	18% YoY sales increase driven by growth in all regions. Around $154m of revenue growth related to acquisitions. Americas & EMEA led Products & Systems Integration segment growth of 14%, & Services & Software segment growth of 27%. For FY18, company now expects earnings growth of around 14.5%, up from prior outlook of 14% including $40m of unfavourable currency impact.
28/9/18	Avanti Communications Group	UK	FY18	USD	29.9	4.7	0.30	Unaudited interim results for 12 months ended 30 June 2018 show earnings increase of 23% from $24.3m in 2017. Kyle Whitehill, who started as CEO in April, said: "The restructuring of the balance sheet and the launch of *HYLAS 4* has given Avanti the platform for growth."

mobile region in recent years, the GSMA says growth is slowing as the industry faces the challenges of affordability and a youthful population. Citing figures from the World Bank, it says around 40 per cent of the region's population is under the age of 16, "a demographic segment that has significantly lower levels of mobile ownership than the population as a whole".

The GSMA adds that the region's current mobile penetration rate of 44 per cent is "significantly" below the global average of 66 per cent.

John Giusti, the organisation's chief regulatory officer, says: "More needs to be done to extend connectivity to the remaining unconnected and underserved populations across sub-Saharan Africa, but this will require a focus on long-term industry sustainability that can only be achieved through investment-friendly policies and supportive regulatory frameworks."

Despite the challenges, the report reveals that smartphone adoption continues to increase rapidly thanks to lower device costs, which is serving to accelerate migration to 3G/4G mobile broadband networks and services.

It predicts that mobile broadband will account for 87 per cent of mobile connections in SSA by 2025, up from 38 per cent in 2017. Moreover, nearly 300 million new subscribers are expected to use their devices to access mobile internet services over the next seven years.

The report also calculates that the mobile ecosystem will add more than USD150bn in value to SSA's economy by 2022 which equates to 7.9 per cent of regional GDP. Last year, mobile technologies and services accounted for 7.1 per cent of GDP across SSA, a contribution that amounted to USD110bn of economic value added.

The region's mobile ecosystem also supported three million jobs in 2017 and contributed almost USD14bn to the funding of the public sector in the form of general taxation as well as sector-specific levies on the consumption of mobile services.

PTToC market predicted to increase significantly

The global push-to-talk over cellular market (PTToC) is expected to grow at a CAGR of 8.5 per cent from 2018 to 2026, says Persistence Market Research (PMR).

In its *Push-to-Talk Over Cellular Market – Global Industry Analysis 2013-2017 and Market Forecast 2018-2026* report published in early August, the researcher says the PTToC market was worth USD2,741.4m in 2017 and predicts this will "grow significantly: to reach USD5,658m by 2026.

PMR believes this is due to a worldwide increase in demand for next-generation LTE networks.

It also says that the increasing penetration of IoT devices in various industry verticals is encouraging mobile device manufacturers to integrate PTToC software into their hardware. As a result, PMR says the software subsegment in its study is projected to register more than 30 per cent of global market share at the end of 2018.

Moreover, it says the software segment is expected to grow at a relatively higher CAGR as the demand for PTToC software is growing rapidly in various countries such as India due to an expanding mobile workforce.

Apart from this, the services segment is also expected to witness a high growth rate during the forecast period as the demand for integration and deployment services and maintenance & support services for PTToC solutions is growing rapidly in various developing countries around the world.

Arabsat aims to boost HTS services

Arabsat has signed a new multi-million euro contract expanding its long-term partnership with Newtec.

The companies say their agreement will enable the launch of new high throughput satellite (HTS) services in Africa and the Middle East, including enterprise and VNO services, IP trunking and mobile backhaul for 3G and 4G services.

Under the partnership, Arabsat will deploy Newtec's *Dialog* platform as well as various DVB-S2X wideband modems. The specific modem used for each customer will depend on the market being served.

Once launched, the new services will use Arabsat satellite capacity, with the initial hub expected to be installed in Europe by the end of October.

Arabsat CEO Khalid Balkheyour says: "Expanding our partnership with Newtec in this way will help us meet rising market demand for high-throughput and high-performance services, pushing the boundaries of what is available today."

CETel and Türkmen Hemrasy team up

CETel has signed a cooperation agreement with satellite operator Türkmen Hemrasy CJSC which operates *TürkmenÄlem52°E*.

Orbiting at 52.0°E, the satellite not only covers Turkmenistan but also Central Asia, Iran, Turkey, North Africa and most of Europe. It carries 38 Ku-band transponders and is specifically designed for communications and broadcasting. It's claimed the satellite's east and west beams provide "major opportunities" for companies operating in its coverage zone.

CETel says the aim of the cooperation is to "mutually create a business environment that helps customers proceed with their communications requirements on fixed satellite services".

The two companies will offer their joint services and expertise to enable what they claim will be the "effortless" management of end-to-end connections, including backhaul, regulatory requirements, and local field support.

CETel adds that customers will mutually benefit from having a strong satellite operator in the region with "ideal" coverage, paired with a WTA full-certified teleport located in the heart of Germany.

MD Guido Neumann says: "The region of Turkmenistan is of particular interest as it carries vast amounts of mineral resources. Also, Turkmenistan with the desert of Karakum which covers 80 per cent of the country, necessitates rural communications based on satellite."

INVESTMENTS, MERGERS, ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
23/7/18	G+D	Various financial institutions	Bonded loan	EUR200m	This is the first time Giesecke+Devrient has placed a bonded loan. The issue was placed with a greater number of savings banks & co-operative institutions as well as the German commercial banks, and comprises terms of between five & 10 years. Proceeds will be used for general business financing as well as supporting operational growth in the areas of payment, connectivity, identities, & digital security.
23/7/18	Infinera	Coriant	Company	USD430m	Infinera will pay around $150m in cash at closing, plus estimated additional amounts of $25m in two quarters post-closing, & $55m over a period of years. It will issue around 21 million shares, which when combined with the cash consideration, results in total transaction consideration of around $430m. Infinera says proposed acquisition positions it to capitalise on the next wave of global network spending as operators transform their networks to transition from 4G to 5G, from OTN to packet, & from closed to open architectures.
9/8/18	Es'hailSat	Eutelsat	Stake in *EUTELSAT 25B*	EUR135m	Eutelsat & Qatar's Es'hailSat jointly launched *EUTELSAT 25B/Es'hailSat 1* in August 2013 to serve users across MENA & and Central Asia. Eutelsat says its share of the satellite generated FY2018 revenues of c.€16m in video application, adding that the sale has no impact on its revenue objectives.
27/8/18	Nokia	European Investment Bank	Loan	EUR500m	Nokia will use financing to further accelerate its R&D into 5G. Loan has an average maturity of approximately five years after disbursement, which can take place at any time during the next 18 months. The EIB transaction is supported by the European Fund for Strategic Investments (EFSI), a key element of the EU's *Investment Plan for Europe* (also known as the *Juncker Plan*).

Moving Wireless Forward

Mobile Mark is a leading supplier of innovative, high performance antennas to wireless companies across the globe. We've been in the wireless industry for over 30 years and have our roots in the early Cellular trials. We have grown and evolved over the years, along with the industry.

Today, we benefit from enhanced design capabilities and expanded production capacity – along with a greater understanding of new and emerging markets – all of which have allowed us to become one of the best antenna developers in our field.

Our customers have been our partners throughout the years. We believe in taking the time to understand our customers' individual needs. Through close consultation with clients, we are able to deliver innovative, tailored solutions that meet specific antenna requirements.

Rapid prototyping capabilities allow us to take our designs from concept to reality in an extremely short time span, and to verify the performance of the antenna. A variety of network analyzers and an anechoic chamber enable us to conduct measurements up to 13 GHz, and ensure that the antennas designed meet or exceed customer requirements.

We have onsite injection molding equipment and a fully equipped modeling shop staffed with skilled model makers to assist in the design phase and help us come up with a superior product – an antenna that not only meets the customer's electrical specifications, but is also very attractively packaged.

Mobile Mark antennas are used in many sectors of the wireless industry. Here are just a few examples:

Asset Tracking & RFID

Managing and tracking important assets can be a challenge in the field, and both RFID and WiFi offer effective wireless solutions. RFID / WiFi technology allows us to identify, monitor and track items ranging from medicine to fruit to parcels to people. Since each application has its own challenges, Mobile Mark offers a range of antennas so network developers can choose the right mix.

MobileMark
antenna solutions

We are now looking for distributors throughout Africa

Commercial Fleet Management

Mobile Mark has consistently lead the industry with the most extensive and innovative range of antenna solutions that combine multiple wireless technologies: from simple GPS & Cellular antennas to complex 6-cable antennas combining LTE MIMO, WiFi MIMO, DSRC and GNSS in the same antenna housing. This combination of wireless technologies allows fleet owners to track and/or redirect their fleets of cars and trucks for optimum efficiencies. Mobile Mark antennas are rugged enough to handle tough environments and efficient enough to maintain reliable connections.

Public Transit & Bus Management

From monitoring the location of the bus to monitoring the condition of its tires, wireless has become an essential part of professional bus management. Mobile Mark's multiband antennas allow the system to capture that information and transmit it back to a central monitoring station with real-time connectivity. For an added touch, real-time WiFi service can also be added for the passengers. That's why companies like INIT have selected Mobile Mark antenna to complete their product offerings. And they have made the following endorsement:

"INIT GmbH – as a worldwide leading supplier of integrated planning, dispatching, telematics and ticketing systems for buses and trains – uses Mobile Mark bus antennas in public transportation projects all over the globe.

For example: INIT has installed Mobile Mark antennas in projects located in Abu Dhabi, Hertfordshire UK, Turku Finland, Oslo Norway, Montreal Canada, Luxembourg, as well as several German projects.

In 2017, a fleet of more than 1,500 buses will have Mobile Mark Antennas installed in one of INIT`s current major projects for National Express, West Midlands, UK."

Remote Monitoring & Surveillance

Surveillance plays an important role in maintaining secure settings. Network deployments need to be low maintenance and weather resistant. Broadband surface mounts offer flexibility for multi-frequency coverage and are rugged and dependable. YAGI antennas provide practical point-to-point coverage. Our antenna solutions are designed to handle tough conditions while providing the reliable wireless connection you would expect from a Mobile Mark antenna.

Mining & Exploration

Modern mining operations rely on a battalion of vehicles, ranging from massive extraction vehicles to modest-sized material transport trucks. These vehicles operate in tough environments where high vibration is a frequent wear and tear challenge. Mining companies throughout Africa have relied on our rugged, foam-filled mobile antennas for consistent connections. Mobile Mark's infrastructure antennas have been used for rapid deployment and redundancy coverage for effective wireless coverage in isolated settings.

Smart Cities & Smart Highway

For cities and highways, the lynchpin of a successful "Smart" system will be dependable wireless connections. Companies like Kapsch understand this, and have worked with Mobile Mark to find ideal antenna solutions. Wireless networks must reach seamlessly into hard-to-cover corners of city intersections and along vast expanses of highways. They must be carefully embedded in city lighting and electrical meters. Mobile Mark offers both small network infrastructure as well as embedded antenna elements to help network designers tie all the pieces together.

Let us know how we can help

We understand the RF wireless world and are ready to help you evaluate your options. Contact us by email, phone or fax and let us know how we can help.

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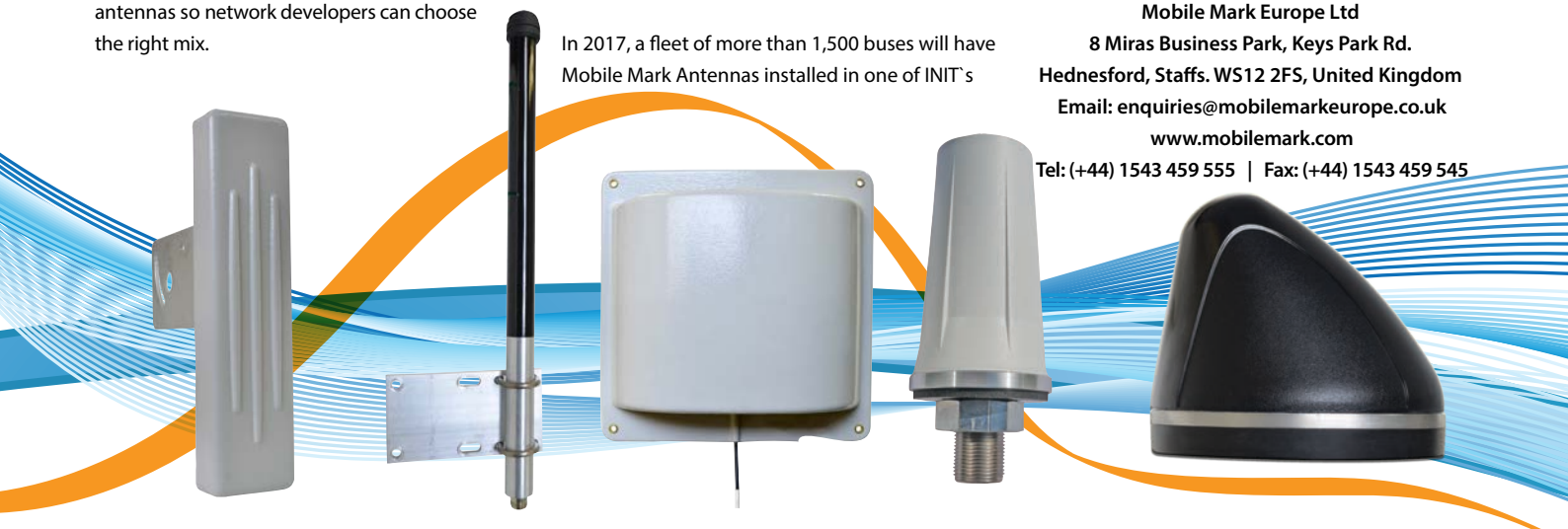

R&S unveils first Bluetooth Low Energy signalling test solution

Bluetooth Low Energy (BLE) has emerged as a major transmission technology for IoT.

But according to Rohde & Schwarz (R&S), when drafting the BLE test specifications in 2010, the Bluetooth Special Interest Group did not specify an over-the-air signalling test mode, only one that was direct and non-signalling.

The company says it now offers a solution for this with the world's first platform for BLE RF signalling tests under realistic conditions.

R&S says its solution makes it possible to determine the RF characteristics of a BLE device via a Bluetooth OTA link or over a wired connection to the antenna. With this approach, it says users can, for example, measure the level, modulation and receiver characteristics of individual or all data channels for frequency-hopping transmissions, which are typical of Bluetooth.

The company also offers an advertiser testing option for its *CMW* series of wireless connectivity testers to measure the RF parameters of advertiser channels. It says the BLE signalling functionality enhances the BLE direct test mode and the BLE advertiser mode. With these functionalities, R&S claims it is now possible to solve even complex measurement tasks in development, production and for OTA applications.

The *CMW* platform has been designed to deliver the full range of Bluetooth RF tests, including *Classic*, *LE* and the latest standard, Bluetooth 5.03. Along with signalling tests and tests in direct test mode, R&S says the platform enables diverse audio tests on Bluetooth Basic Rate/Enhanced Data Rate links. *www.rohde-schwarz.com*

Livewire helps reporters make solid connections

Livewire Digital describes *SilverBlade II* as a lightweight small-footprint unit that "seamlessly" bonds cellular and Wi-Fi services. It is designed to provide a highly resilient internet connection for broadcast professionals to deliver low latency live and file-based media from cameras, laptops or mobiles.

SilverBlade II features Livewire Digital's *Razorlink* technology which, it's claimed, aggregates and bonds internet bandwidth across 3G, 4G, Wi-Fi, DSL and satellite networks to "significantly enhance" data transfer rates for fast delivery of video content.

The company adds that connection dropouts – a key issue for TV crews on the move – are managed seamlessly by *RazorLink* which automatically migrates to alternative networks and optimises the connection so users can make take advantage of all the available bandwidth.

SilverBlade II is said to be "highly cost-effective" as broadcasters pay a one-off purchase fee and then use their own SIMs.

Support for global cellular modems is also an integral part of the unit. Livewire says unlocked modems enable the use of any service provider, reducing costs and increasing flexibility. *www.livewire.co.uk/products/silverblade*

AP offers wireless and wired Gigabit connectivity

Zyxel Communications says its new *NWA1302-AC* access point makes it more practical to deliver reliable, high-speed wired and wireless internet to every user in every room.

The device is said to integrate "cutting edge" AP technology and a Gigabit switch with PoE. Zyxel says it eliminates the need for network switches as users deploy one device in each room they want to connect.

The *NWA1302-AC* also features the company's *NebulaFlex* management system. This offers standalone mode or cloud-based control. In standalone mode, it handles traffic autonomously which, according to Zyxel, eases the burden in staff. If necessary, the AP can be switched to cloud-based mode to give an administrator complete control over from any browser via the *Nebula Cloud Centre*.

The vendor adds that the unit has a smart antenna and beam-forming technology which dynamically customises signal direction for each individual device. It says this creates the best path to deliver Wi-Fi signals while mitigating interference from neighbouring APs.

Zyxel says the *NWA1302-AC* can be mounted on a wall, outlet box, desktop or out of sight behind a table, all in minutes and without the need for any additional kits. *www.zyxel.com*

Wi-SUN launches certification for Field Area Networks

The Wi-SUN Alliance has announced its Field Area Networks (FAN) certification programme.

According to the alliance, FANs include communications infrastructure for very large-scale networks and enable devices to interconnect within a single common network.

Through the programme, Wi-SUN will certify products based on their compliance to a communications profile derived from applicable open standards and their ability to interoperate with other alliance certified products.

It's claimed FAN certification offers utilities, cities and service providers adaptable multi-service networks that will help ensure interoperability today and for future generations. Wi-SUN says it will also reduce the time needed to evaluate new products, as behaviour, performance and interoperability are well defined.

Other key benefits of the programme include eliminating single-vendor lock-in, and encouraging the development of a global ecosystem of standards-based products, reducing the risk and costly impact of stranded assets.

Wi-SUN says its certified products are "rigorously" tested by an authorised third-party test lab to ensure the devices work together effortlessly and securely for rapid time to market. It says certified devices include a digital certificate to authenticate entry to a Wi-SUN FAN network, significantly reducing vulnerability to cyber security threats.

Under a separate agreement, Wi-SUN has selected GlobalSign to provide certificate authority services to alliance member companies. Wi-SUN members plan to announce certified products later this year. *www.wi-sun.org*

Comprion claims first with M2M SIM for RSP testing

Comprion believes the future will see an increasing number of machine-to-machine devices with an eSIM. As a result, the company has developed a test eSIM (also known as test eUICC) for the M2M architecture to ensure that switching to another mobile operator and the related remote SIM provisioning (RSP) work reliably.

Comprion says its *Test eUICC M2M* enables MNOs and infrastructure suppliers to test the interoperability of the included components in the eSIM machine-to-machine environment during product development and integration.

According to the firm, running RSP functions is protected by credentials that are normally not known to the user. Comprion says that as the *Test*

eUICC M2M is personalised with test certificates and test keys, it allows technicians to set up an RSP test infrastructure. This means that defined procedures for the remote provisioning and management of the embedded UICC can be executed in a test environment.

As well as testing M2M device interoperability, the *Test eUICC M2M* can be used for functional testing of the subscription managers (SM-DP and SM-SR), as well as verification of SIMalliance profile definitions.

Comprion says it comes with a pre-loaded test profile that has been created in accordance with the company's long-standing experience in the field. The profile includes the 3G test algorithm.

Comprion adds that the profile's file structure can be scanned and updated via remote file management (the keys needed for this are provided). Moreover, it says different profiles can be loaded to the card for testing purposes by means of the respective eUICC standard procedures.

The Test *eUICC M2M* is removable and comes in the 3FF format (mini-UICC). *www.comprion.com*

PTToC radio utilises LTE and Wi-Fi

The *PNC370* is Hytera's first broadband radio that focuses on Push-to-Talk over cellular (PTToC). The company says the device is "extremely easy and convenient to use" over existing WLAN and mobile networks and claims it offers "excellent" in-building coverage via Wi-Fi.

It's claimed that the new radio is also the "ideal" solution for various broadband solutions. Hytera says it features PTToC services and *Android*-based apps that are adapted to meet users' needs, and can be managed remotely from a central platform.

An open API is also available for third-party providers to develop and adapt their own apps.

The *PNC370* is designed to combine the advantages of PMR communications with all of the available broadband networks in its surroundings. Hytera says it offers individual and group calls, emergency calls, as well as quick call setup with "great" audio quality. A built-in GPS function means that position detection and scheduling is possible, while the real-time clock enables call history to be displayed.

Battery capacity is said to guarantee a long operating time and can be charged using a micro-USB interface as well as an optionally available six-unit charger. *www.hytera.com*

PTToC market predicted to increase significantly – Wireless business, p16

cTU claimed to be smallest mmWave radio

Siklu has added a compact terminal unit to its *MultiHaul* series of point-to-multipoint millimetre wave radios. It says the new *cTU T201* is a self-aligning mmWave radio that is ideal for low profile installations anywhere.

The firm says the *cTU T201* condenses *MultiHaul*'s "rich" feature set into a device that measures 6.5 x 3.1 x 1 inches – roughly the size of an *iPhone X*. Siklu claims that makes it the smallest mmWave radio currently available on the market.

Available in multiple colour options, the device is said to enable installation everywhere, eliminating costly site preparations and long cable runs. Siklu says this, coupled with the self-alignment and auto-provisioning features, allows technicians to complete field-installs and commissioning in under 15 minutes per link.

"Thus, the *cTU* reduces the TCO for Gigabit connectivity to new levels and provides a return on investment often measured in months by offering an unbeatable Gb per dollar," states the firm.

It adds that service providers will benefit from using the radio for 5G fixed wireless access applications on the same mmWave wireless network simultaneously for delivering multi-gigabit connectivity. The *cTU*

T201 is also supported by Siklu's *SmartHaul WiNDE* application, a SaaS application for automated network design for its point-to-point/multipoint radios. *www.siklu.com*

Also look out for...

Tests 'prove' TETRA as good or better than GSM-R

Siemens has worked with critical comms specialist DAMM to successfully implement and test an open and interoperable TETRA packet data solution which complies with the demands for *ETCS L2* (*European Train Control System Level 2*).

The tests were mainly focused on bandwidth requirements and the reliability of data delivery. They were performed according to UNISIG Subset-093 (PS version) – the communication requirement specification for ETCS describing the worst-case conditions for ETCS communication.

Siemens decided to use packet data as this service is said to provide scalable and sufficient bandwidth for ETCS level 2. Furthermore, unlike circuit-switch service, the data are fully interoperable between vendors of a train-borne OBU (onboard unit) and a wayside RBC (radio broadcast centre) along the rail track.

The partners say the tested solution provided two dimensions of interoperability – firstly, the interoperability between TETRA vendors who have completed interoperability tests for packet data; and secondly, the interoperability between OBU and wayside RBC vendors secured by the use of standard *ETCS L2*, which is also specified for GSM-R packet data. Within the solution tested the standard was kept. The main change was the replacement of the GSM-R hardware with TETRA equipment. In this way, the two companies say the safety integrity level was maintained between both the train-borne OBU and wayside RBC.

It's claimed the test results proved that data transmission quality in both directions was always above requirements of the standard and that TETRA delivered equal or even better results than a GSM-R system.

Siemens Mobility spokesperson Sven Hagenbuck says: "Thanks to the easy integration based on a pure IP interface and the longer life time expectation of TETRA systems, this solution can be beneficial or an alternative wherever GSM-R is not mandatory due to authority regulations."


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Attacking the hackers

With criminals increasingly targeting mobile users and fraud on the rise, the issue of security is never far from the headlines. So how can operators safeguard their networks and stay one step ahead of the hackers? RAHIEL NASIR asks the experts.

Mobile networks are coming under increasing attack from fraudsters, hackers and cyber criminals.

For example, South Africa's position as one of the continent's fastest-growing telecoms markets makes it an increasingly attractive target for cyber criminals. In a study published earlier this year in March, threat intelligence specialist Anomali cited a number of reports about cyber attacks on South African service providers. These included: Telkom being hit by *WannaCry* ransomware in 2016; a flaw in Vodacom's portal that allowed any subscriber to access high-level account summary information linked to any phone number; customer records becoming accessible following a flaw that was discovered in Cell C's portal; and sensitive information that was found accessible in MTN's e-billing portal. The latter, along with affiliated service providers, also suffered a service outage due to a DDoS attack in 2013.

Anomali also quoted the global *Threat Impact* index from security specialist Check Point. South Africa was ranked 21 in the global list of countries and was placed ninth overall in Africa, but is by no means the country that is most at risk on the continent. Zambia, Nigeria, Uganda and Malawi all fared worse.

Whilst cyber crime in general is a global issue that can impact anyone and any body, from individual consumers and organisations to governments and states, mobile operators face the additional scourge of revenue leakages through, for example, the fraudulent use of SIM boxes, particularly in Africa.

Biren Sasmal, CEO of Ghana-based revenue assurance specialist Subah, says: "The reality is that Africa has been hit by several telecom frauds. SIM box fraud, also known as the interconnect bypass fraud, is one of the major ones affecting the market. The impact is huge in terms of the loss in revenues to telcos and taxes to the government. It is estimated that Africa loses more than USD200m every year to interconnection frauds. I have seen more than 80 per cent of African operators facing SIM box fraud."

Sasmal says a major misconception is that SIM box fraud happens in countries with very high termination rate. "The moneymaking opportunity for the fraudsters is the differential between the international termination rate and the local termination rate. So even in countries where that is only a few cents, there's still enough margin for fraudsters to make money."

UK-based telecoms revenue assurance specialist Revector has been active on the continent and tracking down SIM boxes since 2008. Its founder and CEO Andy Gent explains that the company recently worked with a major low-cost carrier in one West African country that had been targeted by fraudsters and seen an 80 per cent decline in business. "Three months later, Revector [was able to] return USD500,000 revenues per month of increased inbound traffic – USD22,600 per business day – as the fraudster sending the traffic could no longer keep up with the 'cut off' SIM box numbers it needed to replace. The SIM

box route into the country then failed and got switched off by the low-cost carrier."

Nonetheless, SIM box fraudsters continue to thrive in Africa.

"Each year, I want to believe the MNOs would have invested the effort and addressed this as well as the new and highly costly OTT bypass issue," says Gent. "This is not the case: changing rates from promotional tariffs and cross-border plans continue to encourage international bypass. The reality is that the marketing teams should work much more closely with the fraud teams across the continent."

The i3forum is a not-for-profit industry body that brings together the international carrier ecosystem to enable and accelerate transformation. It believes operators in Africa have been traditionally exposed to higher levels of fraud incidents compared to other regions – as well as SIM boxing, it says subscription, international revenue share fraud (IRSF), and partner channel frauds are some of the most prevalent.

Katia González, chair of the forum's fraud group and also head of fraud prevention at BICS, says: "While operators have been investing a lot in SIM box protection, IRSF issues are starting to get more attention. 'Wangiri', a form of IRSF, has reached an epidemic level specifically in Africa but it's also a fast-growing fraud scheme around the world."

'Wangiri' originated in Japan and is said to mean 'one ring and drop'. Those behind the scam literally do just that – they call a mobile or fixed line number, let it ring once, and then drop the call. Unsuspecting mobile users see a missed call from an international number that they don't recognise, and the fraudsters hope that their expensive, premium rate per minute international numbers will be called back so that they can profit. González says targeting Wangiri is one of the key focus areas for the i3Forum's Fight Against Fraud workgroup.

Sasmal points out that signalling security and the design of signalling protocols for next generation networks also needs to take centre stage and is crucial for the success of the industry and future networks.

This was highlighted earlier this year when AdaptiveMobile Security announced it had detected what it described as "increasingly sophisticated" attacks via the next-generation of the Diameter signalling protocols being used for 4G.

"If each MNO or carrier goes it alone and tries to deploy their own solutions, we will never be successful."

To acquire its insights, the company said it analysed international traffic that used Diameter from 10 mobile networks worldwide. It looked at traffic travelling to and from more than 80 countries across five continents and claimed to have detected a range of malicious activity, from simple to complex, affecting both mobile subscribers and mobile networks.

Speaking at the time, AdaptiveMobile's chief intelligence officer Cathal Mc Daid said that up until now, Diameter vulnerabilities were thought to be theoretical. "This new research clearly demonstrates that they are actually being exploited in the real world, meaning the risk is real and must be addressed. Most importantly, carriers need to understand what is being detected and cannot rely on simple categorisation or rules to decipher what is malicious activity and what is not."

Mc Daid went on to warn that while the threat is now proven, malicious traffic will remain hidden "amongst the noise" without an added and critical layer of intelligence. "As Diameter use widens and SS7 security improves we expect rogue actors to exploit Diameter more and more."

What MNOs should look for

Having said that, the MNO still remains the gatekeeper in all this – to reiterate González's point above no one is going to protect the operators' networks and infrastructure on their behalf. So when choosing an assurance solution to protect against revenue leakages, what do the cellcos need to look for?

"There are many types of solutions and not one fits all needs,"says Gent. "My personal view as an ex-CEO of a major operator is to go for a proven solution from a reliable vendor and not the latest sales pitch. Test the vendors, and get them in to analyse your network for risks. Every single fraud and revenue assurance service provider should be able to prove a return on your investment."

According to Subah's Sasmal, revenue leakage generally occurs in the organisational process and/or the technology side of business. "It can come anywhere in the revenue cycle, from sales to network configuration and rating and billing.

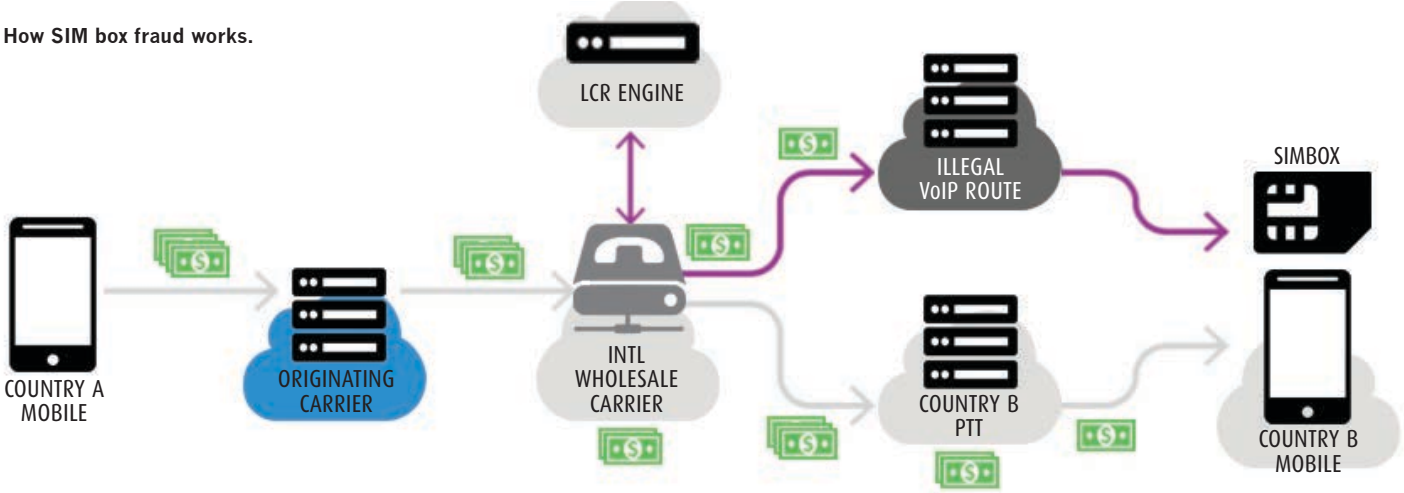
"The areas most vulnerable to leakage and fraud are the revenue streams with the largest volume of payments including pre-paid, roaming and post-paid plans. Many revenue leaks occur because organisations don't have integrated, real-time access to service or contract data, and they use manual analysis rather than automated processes."

This latter point is crucial for Subex which believes AI and predictive analytics represent the future. Maheshwari claims the company is committed to ushering in this future where all of its customers, including MNOs, will be able to predict with certainty the consequences of every action they take, and therefore predict and avoid every risk and every threat.

Maheshwari also advises MNOs to avoid the 'old ways' of choosing and using OSS/BSS vendors. "While in traditional thinking, efficiency demands singularity of approach, nature teaches us singularity is a sure way to extinction. Similarly, in fraud and security, the one trick pony will be found out sooner than later. So ask if the vendor has a multi-pronged, multi-dimensional approach to solving fraud and security challenges."

Like Subex, Amdocs also says that machine learning- and AI-based methodologies should be part of the solution, and that a different approach is now needed when it comes to selecting a platform. "Service providers are becoming *digital* service providers. Many of the traditional revenue assurance methodologies – rule and statistics based on knowledge of human experts which worked well in past decades – are not enough to support the new digital ecosystems."

How SIM box fraud works.



"Many revenue leaks occur because organisations don't have integrated, real-time access to service or contract data, and they use manual analysis rather than automated processes."

González echoes this view when she says that operators are working in a mode of "incident-induced learning" with a silo view on fraud prevention. Her recommendation is to look at a solution that provides fraud intelligence around the world, seamlessly and efficiently. "Detection mode is highly unreliable and always introduces delays in fraud prevention. MNOs should look for more proactive and real-time ways to prevent fraudulent attacks from happening.

"Most incidents of fraud actually occur during non-business hours. That's why 24x7 fraud coverage is an absolute must. New data feeds and technologies such as Big Data and signalling analysis should be focus areas of investment for operators so they can go to the next level in fraud prevention."

More tech, more opportunities for the bad guys?

From a security perspective, are things only set to get worse for MNOs as they progress from 3G to 4G and beyond, and also move out to the edge and connect objects in the IoT?

"As African mobile carriers adopt the latest technologies, we firmly believe that new cyber fraud challenges will emerge," says Michal Sever, product marketing manager for Amdocs' Revenue Guard. "This will lead to verification and customer authentication in digital self-service channels (i.e. digital transactions through mobile). Applications through operators and/or web portals will ramp up. In addition, increasing internet speeds and bandwidth will enable operators to offer advanced IoT applications and services, hence new security challenge are expected to emerge in this space as well."

González is likely to support this view when she says that the mobile ecosystem is continually growing, and when moving from end users to end points the opportunities for fraudsters grows. "Without proper focus on security and investment, the hacking of IoT devices may become the main method of security threats to operator networks.

"Organisations and consumers have a growing number of connected devices that hackers are targeting. This challenge will only continue to grow as the number of smart devices we use multiplies."

But Revector's Gent is not so pessimistic: "4G is building in new security; IoT will be a challenge but if the MNOs build a complete security team and rise to the challenges they can protect themselves."

If there was one thing that many of the industry experts we spoke to agreed upon, it was the view that mobile security is not just an MNO problem.

"We are at a critical time for the entire telecoms ecosystem. Our businesses are diversifying, and we have to work together to ensure that services are both secure and profitable," says González. "The industry as a whole has to collaborate and work together to create secure environments that are not easy targets for fraudsters. If each MNO or carrier goes it alone and tries to deploy their own solutions, we will never be successful. The whole ecosystem is more interconnected than it has ever been and we have to view the fight against fraud in the same way."

She goes on to state that while operators are responsible for protecting their networks and infrastructure, support from governments and regulators can ensure there's a set process that can be followed. "By enforcing these policies, they can help advocate and protect consumers from fraudulent attacks. Having this support will promote the sharing of information between operators and wholesale carriers in a coordinated way.

"Ultimately, it's up to the carriers to work together with whoever will stand up and collaborate to fight fraud. Across the entire ecosystem, which includes governments and regulators, we have to work together to limit the damage being done by fraud. A fraud-free environment will enforce trust on the telecom industry and benefit everyone related to it directly or indirectly."

The Internet Society also highlights the issue of trust which it sees as key to advancing Africa's digital economy. At the Africa Internet Summit held in Senegal last May, the society unveiled *The*

An illegal SIM box in Congo. SIM box fraud is particularly rampant in countries with high numbers of incoming international traffic where SIM availability is loosely controlled and law enforcement is lacking. The fraudsters mainly use pre-paid SIMs where the ownership and address is hard to detect. There are many variations of SIM box fraud and methods of detecting them therefore also vary.

"IoT will be a challenge but if the MNOs build a complete security team and rise to the challenges they can protect themselves."

Personal Data Protection Guidelines for Africa. They have been jointly developed by the Internet Society and the African Union Commission to facilitate the implementation of the AU's Convention on Cyber Security and Data Protection (known as the 'Malabo Convention'), adopted in 2014.

Speaking at the time, Dawit Bekele, the Internet Society's African regional bureau director, said: 'The lack of appropriate protection for personal data can have a profound impact not just on individuals but also on society at large, to the point of endangering democratic systems. These guidelines explain how people can take a more active role in the protection of their own data as well as the role that other stakeholders, including governments and legislators, have in ensuring the proper use of data."

The guidelines urge all AU member states to firstly recognise privacy as a foundation for trust in the digital environment, and secondly, prioritise the sustainable and responsible use of personal data in the digital economy.

In addition, there are recommendations for citizens such as being aware of the risks and benefits of the digital economy or their online activities; knowing how to exercise their rights under privacy and personal data protection laws; and developing the capabilities to protect their interests online.

So the entire issue of mobile and digital security does not just begin and end with the mobile network or other service provider. As stated before, it has an impact on all of us, and so even individual consumers need to know their responsibilities are when it comes to the safe use of digital services.

"Africa is still largely a voice-centric market where MNOs and carriers are being challenged by voice fraud," says González. Our recommendation to operators across the continent is to get involved in the fight against fraud, share information and follow the ITW Global Leaders' Forum's and i3forum's Code of Conduct. The ultimate purpose of this code is to prevent fraudsters profiting from criminal activity and bring a lasting impact on the carrier ecosystem. It requires a joint effort and if we are all on the same page across the globe, then we can make a coordinated effort to fight fraud." ■

Looking for danger

Community Observers testing the ForestLink system in Cameroon send data via the ForestLink app on their smartphones, but when cellular connectivity isn't available they use Rock Seven's RockBLOCK devices which use Iridium's Short Burst Data service.

From protecting rainforests to securing factories, wireless tech is often the only way to help create rapid reliable security networks.

The world's two largest rainforests, the Congo Basin and the Amazon, are under threat from illegal extraction activities, according to the Rainforest Foundation UK (RFUK). It says that unfortunately, national and local authorities have long lacked the means and mechanisms to deal with these illegalities which destroy ecosystems and undermine both the forest and indigenous peoples' livelihoods.

As a result, RFUK is now actively working with both national and local authorities with its *ForestLink* real-time monitoring system. Rather than relying on external or third-party monitoring personnel, *ForestLink* is used by 'Community Observers' who actually live in the rainforest and act as watchdogs, alerting national civil society organisations and law enforcement agencies of suspected illegal activities via a bespoke smartphone app.

"Our *ForestLink* system evolved out of our community mapping work in the Congo Basin," says Élodie Barralon, real-time monitoring coordinator at RFUK. "We've already used GPRS technology to help communities map their rights across approximately seven million hectares of rainforest. We realised that by using a smartphone and a satellite uplink, local communities could not only map their territories, but could also send alerts of illegalities to protect their natural resources and livelihoods."

After *ForestLink* alerts are sent to a secure database, they are analysed by NGOs and governments. Pending further details from Community Observers that help verify alerts, independent civil society organisations notify the appropriate authorities.

When GPRS isn't available, the system uses technology from UK-based satellite tracking and communication systems specialist Rock Seven. Its *RockBLOCK* and weatherproofed *RockBLOCK+* devices use Iridium's *Short Burst Data* (*SBD*) service to enable reliable information transfers from remote areas where there may not be other means of communication.

The *ForestLink* system is currently used to address a wide range of threats that include illegal logging and mining activities as well as oil spills. Working with local partner organisations, the Rainforest Foundation has trained more than 50 communities in the DRC, Ghana, Cameroon and Peru to use the system.

"Community Observers interact with the *RockBLOCK*s mostly through the *ForestLink* app,"says Barralon. "We designed the system this way to really keep the focus on data collection, while we try to make the transmission aspect as seamless and simple as possible."

It's claimed that thousands of alerts have already been sent by the observers, resulting in legal action against extractive industries. Barralon says: "In Cameroon last year, information provided by monitors led to a shipment of illegal timber being seized by the government. Additionally in Peru this year, alerts sent by one indigenous community led to a dramatic police raid on an illegal mining camp in the Madre de Dios region. The police task force seized and destroyed the mining vehicles on site and arrested several suspects."

Barralon believes that RFUK has "successfully empowered" local populations by giving them the ability to secure and take control of their natural resources as well as their individual and collective rights. Longine Boubok, a Community Observer from Cameroon, backs this up and says: "With the *ForestLink* system, I know that by using just a mobile phone I can record an illegality anywhere in the forest. With this project, I think the community will really see a change. We're not just doing it for ourselves, we're doing it for children too."

ForestLink system is now active in four countries across two continents with *RockBLOCK* ensuring that there is high availability for data transfer anywhere. Barralon adds that each local context requires its own unique approach. "That's why it's so important to keep updating and improving *ForestLink*, and securing global connectivity to make sure it responds effectively to the diverse needs of its users around the world."

Surveillance with no strings attached

With more than 3,000 clients across the continent, the Endeavour Africa Group describes itself as one of the region's leading business solution providers. Its security division designs, installs and maintains fully integrated electronic security solutions, including video surveillance systems.

In 2016, Endeavour was approached by an unnamed African company to provide a video surveillance solution covering a six kilometre perimeter at each of its three different factory sites.

Endeavour's plan included 150 HD IP cameras to be installed on poles (two per pole) along the perimeter. But connectivity soon became a concern, as Datta Wajapey, technical manager for projects at Endeavour, explains: "Our extensive range of CCTV cameras offers a valuable security and loss prevention solution but requires an increasingly reliable connection. Our original proposal was to deploy cables to connect the cameras. However, we knew that such a cable system would be expensive and time consuming to install, and require future maintenance."

Once copper cables were determined to be unfeasible for this high-profile project, Endeavour contacted Cambium Networks for a wireless connectivity solution.

A hub-and-spoke comms architecture was selected at each of the client's three factory locations. The three clusters would be interconnected with high-speed wireless backhaul links.

At each site, Cambium's *ePMP* wireless broadband distribution network solution was necessary to connect the 75 subscriber units using multiple access points installed on high-rise buildings. After considering the available options, Endeavour selected the vendor's *ePMP Force 110* point-to-point radios to provide the 130Mbps backhaul links as an infrastructure to interconnect the APs. Eight 8 *ePMP* access point modules with GPS synchronisation equipped with 120° sector antennas were also deployed at each location to provide the distribution access hub connectivity, while *ePMP* subscriber modules were installed to provide 6-10 Mbps throughput at each of the pole locations that were equipped with two megapixel cameras.

Endeavour installed 150 surveillance cameras but could not use cables to connect them because of concerns over costs and maintenance. Cambium Networks provided a wireless connectivity solution.

Because there were multiple cameras at the pole locations, two Fast Ethernet ports were required for connecting the cameras to the radios. Wajapey says the aux port on the subscriber modules helped to eliminate the need for a switch at each pole and also provided relay to cover blank spots.

He continues by saying the network was swiftly deployed and immediately started to provide round-the-clock HD video surveillance at each factory. "Not only was the installation rapid, but the connectivity has been extremely reliable with excellent throughput," says Wajapey. "Each subscriber module was able to transmit up to 10Mbps to its access point without any breaks.

"Each radio provides two ports for camera connectivity, and there is no need to use a switch at each pole. Furthermore, the PTP links saved many potential costs involved in the laying of OFC needed for backhauling."

Overall, it's claimed the wireless network system "easily outperforms" the copper cable alternative for Endeavour, with Cambium's ePMP distribution network solution operating at 2.4GHz and 5GHz with 100Mbps throughput in a 20MHz channel. ■

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Seeing Wi-Fi in a new light

With the new 802.11ax Wi-Fi standard on the horizon, KEVIN WEN wonders if it offers any real advantages over Wave 2.

802.11ac Wave 2 is the latest Wi-Fi standard. When its predecessor, the now widely adopted 802.11ac Wave 1, first launched in 2011, it brought a host of advantages for businesses and consumers alike. Improved power management, higher capacity and lower latency provided a higher performance network and made Wave 1 the gold standard it is today.

In many respects Wave 2 builds upon the success of its predecessor, whilst also bringing additional feature benefits for business networks, particularly for enterprises that transfer large volumes of data.

That said, Wave 2's performance boost looks less significant when compared to those of the next generational leap, 802.11ax (ax). Due in 2019, demos show a five to 10 times performance improvement over Wave 1 and four times over Wave 2. So is the upgrade to Wave 2 worthwhile or should you hold out for ax?

Most business owners aren't networking experts and it would be easy for them to assume that the extra MHz of bandwidth and Gbps of throughput that ax will offer over Wave 2 as essential for their companies. However, to write-off Wave 2 in favour of the promises of ax could, in many situations, prove a lost opportunity.

Wave 2 versus ax – the numbers game

While Wave 2 is not as huge a leap forward as 802.11ax aims to be in a couple of years' time, that doesn't mean it's not worthwhile. Chief amongst the significant additions is support for MU-MIMO. This enables Wave 2 access points to send and receive data to and from multiple devices simultaneously, providing a significant boost in efficiency. As such, MU-MIMO improves the overall connectivity experience by distributing data more efficiently. Simultaneous smartphone, tablet and laptop use is already prevalent in the modern workplace, so this extra capacity is a real bonus.

802.11ax will significantly up the ante with OFDMA (orthogonal frequency division multiple access), an ugly acronym that means that rather than having multiple channels, each one is chopped up into hundreds of smaller sub-channels with different frequencies. What this boils down to is that up to 30 clients can

share a channel rather than having to take turns broadcasting and listening on each.

Although Wave 2 accommodates channel widths up to 160MHz (a dramatic increase over Wave 1 which topped out at 80MHz) ax's wider and multiple channels significantly boost throughput. For example, if we assume the throughput is increased by 4x with 160MHz channels (a conservative estimate), the speed of a single 802.11ax stream will be 3.5Gbps. This compares with 866Mbps for a single 802.11ac connection. That's a significant boost, and one that's hard to ignore.

To ax or not to ax?

It's difficult to not get excited by the advances that 802.11ax promises over the existing Wave 2 standard. However, before you plan for an ax deployment upon its release, it's best to consider why these features have been developed – and whether they're necessary for your business.

Ax has been designed to deal with incredibly high-density networks. Its super high data rate and bi-directional MU-MIMO capabilities make it ideal for very dense indoor and outdoor environments, such as conferences, apartment blocks and hotspots. Unless your enterprise network fits the mould of one of these use cases, it is unlikely that you will see significant benefits from ax.

Wave 2 is available now and, since its initial launch in 2016, we have seen the pricing of supporting chipsets dropping to a point where they are actually more cost effective than their predecessors.

For smaller businesses still using a/b/g/n gear and in need of an upgrade, my advice is don't hold out for ax. The speed boost provided by Wave 2 will almost certainly be significant enough to see you through the foreseeable future.

Six surges to expect from 802.11ac Wave 2:

It's a gateway to gigabit: the GbE offerings from Google Fiber, AT&T GigaPower, and Verizon Fios all run on cable. Wave 1 for wireless never quite got to Gigabit speed. Wave 2 will open the door for gigabit Wi-Fi because its physical rate (PHY) is much higher, and that affects the ultimate data transfer rate. To put that in context, the PHY rate of Wave 1 peaks at 1.3Gbps. Wave 2 reaches the heights of 2.34Gbps. Even if it reaches half of that potential, it's still going to beat 1 Gbps.

MU-MIMO: Wave 2 can multitask so it supports more channels. This means that the spectrum is used more efficiently for multiple connected devices, and devices can more easily get on and off of the network. It's similar to the difference between a single bank teller who can only see one person at a time as long as they pay by cheque, and four multi-tasking bank tellers who offer a range of easy transaction methods.

Support for MU-MIMO is crucial since all businesses and homes have multiple connected devices and this resolves most of the headaches for network admins.

Strong performer: in addition to a faster PHY rates, Wave 2 widens the channel to 160MHz, a considerable improvement on Wave 1's options of 20MHz, 40MHz and 80MHz. This makes it easier to handle large files.

Wave 2 also has an extra spatial stream, up from Wave 1's three. According to the Wi-Fi Alliance, device speeds rise in proportion to the number of spatial streams.

More flexibility and more wiggle room: Wave 2's support of additional 5GHz channels is one of its most powerful boosts. If designated for Wi-Fi use, these channels could cater for more users and devices on the network. Around 65 per cent of devices are dual band (source: Wi-Fi Alliance) so they can use both the 2.4GHz and 5GHz frequencies.

It's already compatible with leading devices: The Wi-Fi Alliance has already certified five products for Wave 2 interoperability – they include devices from Broadcom, Marvell Avastar, MediaTek, Qualcomm and Quantenna.

The second wave: while wi-fi.org lists 24 products with 802.11ac Wave 2 feature compatibility, few are hardware-related. Adoption is likely to ramp up, and supporting products will follow with more Wave 2-enabled hardware which is expected to hit the market by the end of the year.

The case for 802.11ax

Whether you're in a conference, sports arena or other public space, complete strangers will all ask each other one thing: *is the Wi-Fi down or just very slow?* That's not great for the branding of a commercial venue such as a hotel. These days, customers expect good Wi-Fi, and hotels are often judged by the quality of their wireless network.

As stated above, 802.11ax (or High-Efficiency Wireless) promises a four-fold increase in average throughput per user. As well as being designed specifically for high-density public environments, like trains, stadiums and airports, the forthcoming standard will also help the IoT.

Ax is good for mobile data off-loading too. So CSPs can off-load wireless traffic to a complementary Wi-Fi network when the local cell reception is poor or if there is a massive influx of mobile phone users in any given cell – such as the presence of delegates at a conference centre attached to a hotel.

802.11ax could be finalised as early as June 2019 because vendors are very excited by the prospect of a high-value upgrade product. Non standard chipsets have been shipping since last year and the first 802.11ax routers are on

A BRIEF HISTORY OF 802.11AX

October 2016: Quantenna Communications announced the first 802.11ax chipset. It supports eight 5GHz streams and four 2.4 GHz streams.

January 2017: Quantenna adds a second chipset with four streams in each band.

March 2017: Qualcomm unveils 802.11ax debut chipset.

June 2017: Broadcom and Marvell follow.

August 2017: Asus introduces first 802.11ax router with 4×4 MIMO in both bands and throughput of 1.1Gbps on 2.4GHz and 4.8Gbps on 5GHz.

Huawei announces an 802.11ax access point that uses 8×8 MIMO and is based on Qualcomm hardware.

January 2018: Aerohive Networks debuts family of 802.11ax access points based on Broadcom chipsets to start shipping mid-2018.

March 2018: Draft 802.11ax standard published

March 2019: Final standard for 802.11ax expected

July 2018: First pilot projects due to begin.

July 2020: Mass adoption expected (terms and conditions apply)

Wave 2 versus ax

Wi-Fi standard	Frequency operating range	MU-MIMO	Number of simultaneous MU-MIMO transmissions	OFDMA	Energy usage
802.11ac (Wave 2)	5GHz only	Downlink transmissions only	4	No support	Power intensive
802.11ax (ax)	2.4GHz & 5GHz with 12 possible channels	Full duplex from multiple sources	8	Uses multiplexing with OFDMA, giving it random access, dynamic fragmentation & spatial frequency re-use. Results in greater efficiency	Uses 'target wake time'

sale at reassuringly expensive prices. Some early adopters will use these non-standardised products in the hope they can perform a firmware upgrade at a later date that keep them compliant when the standard is ratified.

The problem experienced by many of these Wi-Fi 'power users' (such as the aforementioned conference centres and crowd pullers) is that bandwidth is shared among endpoint devices. Often, APs can have overlapping coverage areas. This causes complications with end users as they move between APs which is frequent with crowd behaviour.

The current system is based on the old shared Ethernet model of Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA). This requires endpoints to listen for an all-clear signal before transmitting. In the event of interference, congestion or collision, the endpoint goes into a back-off procedure, waits for the all-clear, then transmits. But in a crowded stadium, a busy airport or a packed train with hundreds or even thousands of end users attempting to stream video at the same time, the system loses efficiency and performance suffers.

Ironically, this was dismissed as primitive more than 20 years ago, and advanced systems such as desktop ATM and Token Ring promised to overcome the issues. But Ethernet fulfilled an immediate requirement and was the cheap


Kevin Wen, European president, D-Link

option, so people bought it rather than the expensive specialist offerings such as ATM and Token Ring. Ethernet, won the mass market because it gave immediate payback before Token Ring could gain momentum – an allegory that is worth bearing in mind when comparing Wave 2 with ax. It's a moot point, as we shall see, whether this is a like-for-like comparison.

For example, 802.11ax offers potentially greater performance, of a magnitude out of proportion with the benefits of Token Ring over Ethernet. In addition, it greatly extends the network coverage and, being more energy efficient, extends the battery life of each device using it.

Performance is the headline selling point. It can deliver a single stream at 3.5Gbps but, crucially, it has also adopted OFDMA multiplexing technology which it took from LTE. This allows it to send four simultaneous streams to a single endpoint. In theory, this creates a potential bandwidth of up to 14Gbps.

Modus operandi

The ax standard takes a variety of well-understood wireless techniques and combines them to make big boosts to existing models. As well as multiplexing from LTE mentioned above, it also uses beamforming techniques that ensure that streams are aimed more accurately at their target antenna. These incremental improvements mean that 802.11ax is back-compatible with 802.11ac and 802.11n.

Another technique ax adopts is QAM. This creates a 40 per cent increase in throughput because it enables more data to be transmitted per packet. It also makes for more efficient use of the available spectrum resources. This is how ax creates broader channels and splits those channels into narrower sub-channels. The result is the endpoints have more channels to use, making it easier for them to get a clear channel without collisions or interference.

Downloads from the AP to the end user have improved too. Early Wi-Fi standards only allowed one transmission at a time per access point. When Wave 2 adopted MU-MIMO techniques, that allowed those same access points to send up to four streams simultaneously. However, 802.11ax can offer eight simultaneous streams, each of which uses beamforming technology to sharpen its aim. ■

ITU to look at ICT technologies beyond 2030

A newly set-up focus group will look at new use cases for applications such as holographic communications which the ITU believes will have a big part to play in industry, agriculture, education, entertainment, etc.

The ITU has launched a new research initiative to identify emerging and future ICT sector network demands beyond 2030 and the advances expected of IMT-2020 (5G) systems.

It has set-up the *Technologies for Network 2030* focus group which is open to all interested parties and will guide the global ICT community in developing a future vision. This will include new concepts, new architecture, new protocols as well as new solutions that are fully backward compatible, so as to support both existing and upcoming applications.

The ITU says these ICT use cases will span new media such as holograms, a new generation of AR and VR applications, and high-precision communications for 'tactile' and 'haptic' applications in need of processing a very high volume of data in near real-time. Focus group chairman and VP of future networks at Huawei, Richard Li, says: "Supporting such capabilities will call for very high throughput in the range of hundreds of gigabits per second or even higher."

The ITU adds that its group will also strengthen and leverage collaborative relationships with other standards development organisations such as ETSI, Association for Computing Machinery's Special Interest Group on Data Communications (ACM SIGCOMM), and the Institute of Electrical and Electronics Engineers' Communications Society.

The union's secretary-general Houlin Zhao says the focus group's work will provide network system experts around the world with a "very valuable" international reference point from which to guide the innovation required to support ICT use cases through 2030 and beyond.

Thailand nationwide TETRA to support over 200,000 users

CAT Telecom operates Thailand's telecoms infrastructure. It will provide government agencies and other critical comms users with access to the TETRA network provided by Motorola Solutions.

Motorola Solutions is supporting the installation of a nationwide digital communications network in Thailand.

State-owned CAT Telecom operates the country's telecoms infrastructure and will provide government agencies, emergency services and other critical enterprises with access to the mission-critical TETRA network.

The shared operator system is described as "highly scalable", and when complete, it will have capacity to serve more than 200,000 users.

Deployment is said to be well under way with CAT utilising Motorola Solutions' broadband enabled push-to-talk platform. The vendor reckons this will enable seamless communication between radio users and other workers via smartphones, tablets, desktop computers and other devices.

Motorola says its system will also deliver next-generation capabilities including location services to pinpoint radio users and other resources in the field, providing improved response to large-scale events.

"Any country experiencing significant growth in infrastructure, innovation, education and skills requires an advanced communications system," says Marcel Verdonk, Motorola Solutions GM for emerging Asia. "This TETRA system will support Thailand's continuing investment in infrastructure modernisation as well as job creation through its construction."

IoT management system keeps railway on track

Slovenian Railways says its new IoT-based Incident-Response Management (IRM) system has already detected several potential hazards just weeks after being installed.

The system detects overloaded freight wagons as well as wheel irregularities that can destroy railway track geometry.

Implemented by local ICT specialist Iskratel, the IRM system is based on a modular concept and has a customised graphical interface for train dispatchers' operational processes. The company claims it provides "clear" error notifications and "easy" management of unexpected events, offering operators pre-defined scenarios and measures for effective actions.

Iskratel says its IoT-based solution operates in real-time, measuring heat from axles and brakes to avoid excessive temperatures that can lead to damage of rolling stock and even derailment. The firm installed the system for Slovenian Railways in August, and in early September the Slovenian Ministry of Infrastructure reported that it had already detected four alarms, all due to overheated train wheels caused by locked brakes.

The IRM also features a track weighting system that detects overloaded freight wagons that can cause fractures of rolling stock, while a flat wheel detector system senses wagon irregularities that can destroy railway track geometry.

In the event of an emergency, Iskratel says its solution immediately alerts the operator with key visual and acoustic information, showing the exact alarm location, alarm type, train number, direction, speed, total composition length and number of axles.

The company adds that before taking any action, the system automatically provides clear guidance to successfully monitor and resolve the situation. Damaged vehicles can also be detected by the system, ensuring quick removal of the vehicle and the risk of fire it poses.

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Drones carry crucial medical supplies

AT&T and Softbox have conducted proof of concept trials to see how drones can be used to safely deliver temperature-sensitive medicines in areas affected by natural disasters.

UK-based Softbox provides specialist temperature control packaging to the pharmaceutical industry. In late August, it was announced that an LTE-connected drone carrying Skypod – Softbox's thermal-insulated packaging system which includes a smartbox powered by AT&T's IoT technology – successfully completed demonstration flights. The trials took place in locations across Puerto Rico in collaboration with pharmaceutical company Merck.

AT&T's IoT technology tracks the Skypod with data viewed on a web and mobile app dashboard. The data includes the box's near-real time external and internal temperatures and its location. The dashboard can flash alerts to help drive appropriate action – for example, it will send an alert if there is a change to the temperature range of 2°C to 8°C. It will also send an alert if the drone goes outside of defined geofencing parameters.

A flying Smartbox From AT&T and Softbox shows how the IoT can help safely deliver vital medicines in a crisis.

Furthermore, during daylight, light exposure data helps signal if the payload has been tampered with by determining if the package is open or closed.

AT&T's various control centres connect and manage the Skypod's sensor data transmission, and the web and mobile app reporting dashboard. The drone is also connected to the AT&T network, providing a communications path for flight plan and telemetry data between the drone and ground control system.

Softbox worked with the AT&T Foundry to develop its Skypod from a prototype that started out as a connected flask. The foundry is a network of innovation centres that collaborates with startups, technology providers and enterprises to move ideas to market faster through rapid prototyping. It moved the IoT sensors that track temperature and location from the lid of the original prototype and integrated them into the smartbox.

AT&T is keen to work on projects that showcase what it describes as the "IoT for Good". After Hurricane Maria hit Puerto Rico last year, the company deployed the Flying COW (Cell on Wings), a mobile site on a drone. It was the first time a drone had been used to connect residents with their mobile phone services after a disaster.

Mesh wireless network opens world of IoT at Antwerp Gateway

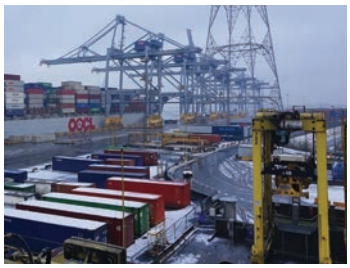
One of Europe's largest and busiest container terminals has a new wireless backbone network that uses Rajant's *Kinetic Mesh* technology.

As well as dealing with around 3,000 trucks every day, DP World's Antwerp Gateway in Belgium is said to handles 2.5 million containers and almost 950 ships every year.

Its wireless network was deployed by UK telco BT and is designed to provide secure and resilient connectivity for not only 900 employees but also the growing demands of connected devices. These will help DP World Antwerp to analyse and optimise processes and operations, such as the movement of vehicles around the terminal.

Rajant says its mobile, scalable and "highly reliable" *Kinetic Mesh* system enables always-on communications so that critical applications can be accessed in real-time and in the "most cost-effective" way.

The firm says its solution provides DP World Antwerp with a flexible meshed wireless backbone network that offers security, resilience and high bandwidth. It's claimed the system dynamically adapts to accommodate connectivity for moving vehicles, and overcomes obstacles within an ever-changing environment including the presence of containers or large ships.



DP World's Antwerp Gateway reportedly handles 2.5 million containers and almost 950 ships annually, along with 3,000 trucks every day.

"The container industry and global supply chain is undergoing huge changes enabled by digital technology," says Patrick Putman, chief information and innovation officer, DP World. "Working together [with BT], we have successfully completed a wireless backbone solution that creates an infrastructure for future IoT deployments, opening up the possibilities of automation and artificial intelligence. It is our backbone for growth."

Google to use Ruckus WiFi to power hotspot rollouts

Google will use Ruckus' technology for its Wi-Fi hotspot initiatives in India, Indonesia and Mexico.

Google Station is claimed to be a high-speed, high-quality public platform for service providers. It aims to give service providers an easy set of tools to roll out Wi-Fi hotspots in public places and high-traffic locations such as airports, malls, universities, railways and mass transit stations.

The platform is offered to providers free of charge with a revenue share based on their ability to monetise the service.

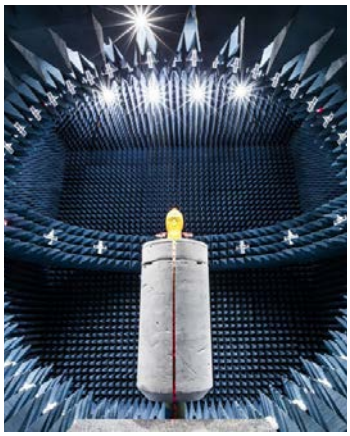
Google says its uses smart, data-backed tools to choose where networks should be designed and deployed. The company adds that it also provides operations and quality assurance support to reduce deployment and operations costs, as well as analytics to improve and enhance services.

Google Station supports select APs from major vendors and industry-standard network architectures. It has already been implemented in locations in Nigeria and Thailand, and is now being rolled out in India, Indonesia and Mexico where it will be supported by Ruckus.

Under the terms of the deal, the wireless infrastructure vendor will provide devices and technologies enabling carrier-grade networks at the hotspots. It will supply its *SmartZone* controller which can manage both virtual deployments of *SmartZone* as well as indoor and outdoor Wi-Fi access points.

Ruckus reckons these hotspots will deliver high-performance Wi-Fi using its patented adaptive antenna *BeamFlex* technology for increased connectivity performance and range, better signals and maximised power efficiency.

"Deploying *Google Stations* with Ruckus technologies is an important step to connecting the next billion users," says David Shapiro, chief business officer of the *Next Billion Users Initiative* at Google. "Ruckus networks are simple to install and operationally cost efficient, enabling us to be up-and-running in no time."



The facility is equipped with various chambers and systems, including an SAC 5 chamber for testing EMC and RF in the wireless range.

TÜV Rheinland opens wireless lab in Sweden

Globally testing service provider TÜV Rheinland has opened a wireless laboratory in Lund, Sweden.

Located at the heart of a technology cluster of research and development companies, manufacturers and integrators, the facility is the first of the European TÜV Rheinland Wireless labs to specialise in IoT products.

TÜV Rheinland Sweden MD Anders Nordlöf says: "On a total of 900 square meters, spread over six individual laboratories, customers will find the entire spectrum of wireless testing options such as Sigfox, LoRa, NB-IoT, ZigBee, 3GPP (2G/3G/LTE), Wi-Fi, Bluetooth, mmW (RADAR) up to current 110GHz and eCall."

He adds that the facility is also equipped with OTA, FAR chambers and SAR systems, and covers both short range and long range radio technologies. There is also an SAC 5 chamber for testing EMC and RF in the wireless range.

In addition to Sweden, TÜV Rheinland also has wireless laboratories in Germany, Italy, Japan, South Korea, China, Hong Kong, Taiwan, India, the USA and the Netherlands.

Stefan Kischka, VP of wireless/IoT at TÜV Rheinland, says: "The laboratory in Lund is one of the milestones with which we are expanding our global commitment to wireless technologies and which will take us a further step forward in fulfilling our *TÜV Rheinland Wireless Strategy 2020*."

Vodafone sends real-time 3D holograms in 5G demo

Vodafone has conducted the first live holographic call using 5G.

At a public demonstration held in the UK in September, Stephanie Houghton, captain of Manchester City and the England Women's football teams, interacted in a 3D, real-time communication with Vodafone enterprise director Anne Sheehan who was more than 190 miles away at Vodafone's HQ in Newbury.

Also taking part was 11-year-old Manchester City and Lionesses fan Iris from Surrey. Despite the distance, she was able to be in the 'same room' as her idol Houghton thanks to the use of a Microsoft *HoloLens* VR headset connected via 5G.

This latest development follows the success of Vodafone's first UK test of 5G spectrum across a live network in April 2018. As from October 2018, the operator plans to switch on 5G trials in the first of its city test beds, following end-to-end testing at its lab in Newbury. Manchester and Birmingham, which are in north-west and central England respectively, will be the first of seven test cities to go live.

The operator adds that it will also roll out 5G to popular UK holiday destinations such as the coastal resort of Cornwall and the Lake District during 2019.

Despite being more than 190 miles away, 11-year-old Iris was able to use 5G and a VR headset to realise her dream of being with her idol, Manchester City and England Women's captain Stephanie Houghton. Pictured right is Vodafone enterprise director, Anne Sheehan.

Kannur International will be the largest airport in Kerala which will become the only Indian state to have four international airports.

DAMM TETRA helps secure Kerala airport

DAMM Cellular Systems will provide a mission-critical secure communication system at Kannur International Airport Ltd. (KIAL) in India.

KIAL will be the second greenfield airport in the southern Indian state of Kerala. Covering an area of 2,000 acres, it will be the largest airport in Kerala which will become the only Indian state to have four international airports.

The facility is said to be being built with "state-of-art" infrastructure and is due to become operational in 2018. During its first year of commercial operation, KIAL is expected to be used by around 1.65 million international and 160,000 domestic passengers.

Consort Digital is DAMM's regional partner in India and will be supporting the delivery of the entire project to the airport. It will deploy the Denmark-based PMR specialist's *TetraFlex* voice and data radio communication system which will be used by all airport operations and maintenance users to safeguard passenger safety.

According to DAMM, its platform offers a fully IP-based solution and decentralised architecture. It says compliance with the open TETRA standard ensures multi-vendor subscriber terminal support, while there is also provision to integrate into smartphones for designated users using the *DAMM TetraFlex* push-to-talk application.

Other key features of *TetraFlex* are said to include integrated voice and data logging solution for storage and playback, gateways for interconnection to PBX and conventional networks, and "easy" integration, installation and commissioning.

Gilat and GSS partner

Gazprom Space Systems (GSS) and Gilat Satellite Networks have signed a contract worth around USD18m to provide broadband connectivity across Russia. Gilat will deliver its multiservice platform and user terminals to operate over GSS' *Yamal 601* Ka-band satellite which is due to launch in 2019. Its 32 beams will be lit up using two Gilat *SkyEdge II-c* gateways that will be installed in Siberia. GSS and Gilat have also agreed to jointly develop communication projects such as IFC and railway transport.

UK develops spaceports

The UK is building its first spaceports and plans to develop both vertical and horizontal launch sites. Sutherland on the north coast of Scotland has been selected as the first vertical launch site. It will be developed using initial government funding of GBP2.5m, and plans to use a combination of proven and innovative rocket technologies. Scotland is said to be the best place in the UK to reach in-demand satellite orbits with vertically launched rockets. Commercial vertical and horizontal launch demand is said to be worth a potential GBP3.8bn to the UK economy over the next decade.

Hytera signs Alagoas deal

Hytera will expand the TETRA network across Alagoas state in Brazil. As well as new infrastructure, the USD6.5m deal also includes a four-year maintenance contract. Hytera first delivered TETRA infrastructure, terminals and a dispatcher for the state's public safety users in 2014. The newly signed equipment contract includes 31 sites with the vendor's *DIB R5* base station. Hytera says this has a maintenance-free, space-saving design and can be installed on walls, antenna masts or in tunnels. It is also designed to offer low power consumption and passive cooling.

Ontix to end mobile 'not-spots' in central London

Ontix is promising to deliver "world class" wireless service to residents, businesses and visitors across the heart of London.

The wireless IaaS provider says that following a competitive tender, it was awarded a 10-year concession contract giving it exclusive rights to deploy small cells on Westminster City Council's street furniture and lampposts. Ontix claims this will provide "next-generation" wireless infrastructure to mobile operators and other wireless network operators.

A pilot wireless small cell network will be deployed in Trafalgar Square in November. This will be available for all operators to trial. A rollout across the wider Westminster borough is then expected to continue during 2019, spanning many of the capital's most popular tourist attractions.

Ontix says that in recent years, pressure on legacy network infrastructure in central London has been growing, with operators struggling to access enough suitable rooftop sites to deploy the macro cells they have been using to date.

Ontix is deploying a pilot small cell network in Trafalgar Square in November. Traffic will be backhauled using the company's hybrid Metrohaul transmission network.

As part of its 10-year partnership with the council, the company will also use its hybrid Metrohaul platform to build a high capacity, neutral-host backhaul network to deliver 5G-ready connectivity for all operators. This will also be available as part of the small cells trial.

Ontix says this will feature a dark fibre core that will connect its fibre nodes in rings. Using the latest wireless equipment, the company says it will then provide high capacity, resilient connections from each fibre node to multiple small cells.

Ontix goes on to claim that unlike the traditional managed fibre links used by mobile operators, its costs will be lower and time to market will be shorter because it does not need to install fibre to every small cell. It adds that solution will also be resilient because its fibre will be deployed in independent 'rings' that will allow traffic to be rerouted if one ring is cut.

DAS hits the right chord at Haus der Musik

Staff and visitors at the new Haus der Musik (House of Music) Innsbruck in Austria will always be connected thanks to its distributed antenna system (DAS).

Due to open its doors in early October 2018, the venue houses nine cultural institutions and musical training centres across an area of around 12,900m^2, making it one of the largest buildings in the state of Tyrol.

Working in partnership with MVNO Innsbrucker Kommunalbetriebe, system integrator Iconec installed JMA Wireless' *TEKO* DAS to enable cellular coverage throughout the Haus der Musik while still maintaining its design aesthetics.

JMA says the building presented many challenges with its complex structure spanning seven levels, including two located underground.

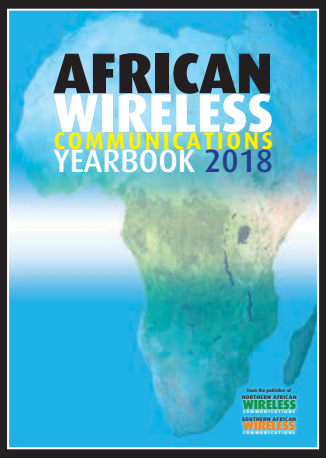
For the first phase of the wireless system, the company says it used its *iBwave* simulation tool to design an "intelligent and aesthetically elegant" system while ensuring smarter planning, streamlined designs and seamless deployment plans.

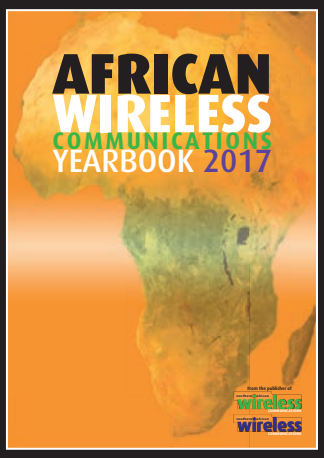
The Haus der Musik is scheduled to open in October 2018 and will be one of the largest buildings in the state of Tyrol.

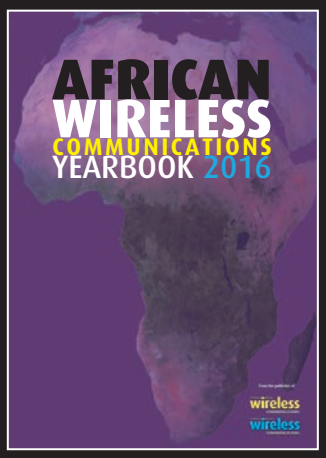
JMA continues by saying *TEKO* will enable in-building wireless communications with one sector supported by four low power remote units. Each of these is connected back to the master unit via a single optical fibre which will transport five bands – 800MHz, 900MHz, 1800MHz, 2100MHz and 2600MHz – and will provide support for three mobile operators.

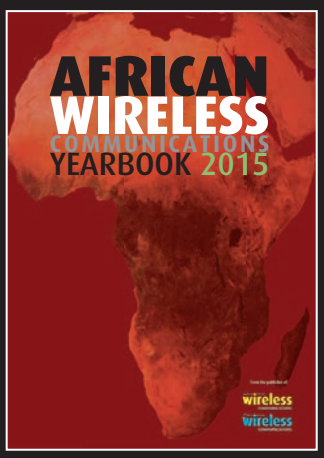
The vendor also claims that with its innovative capabilities, *TEKO* is up to 50 per cent less expensive than competitor offerings.

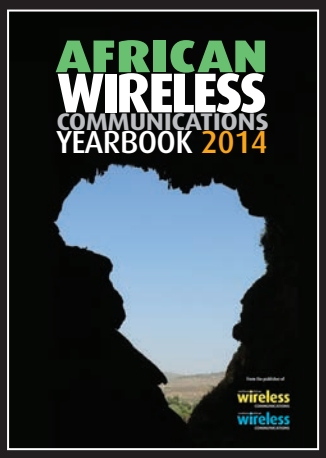
Knowledge is power.

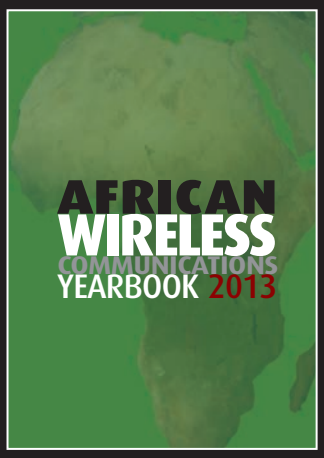


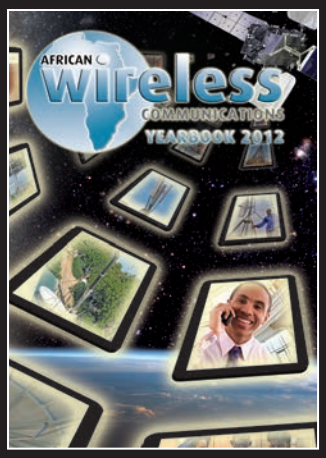


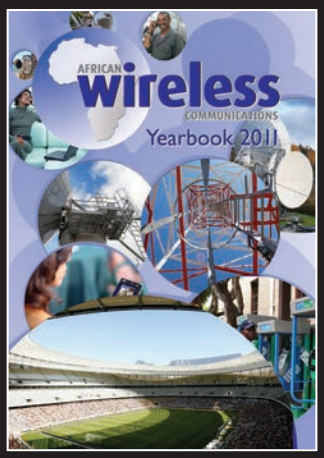


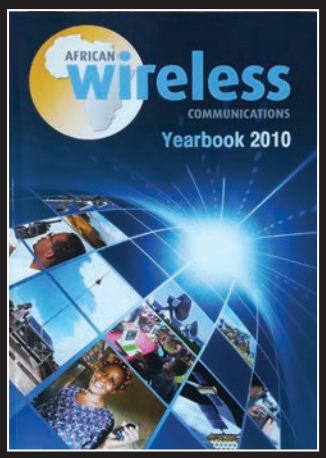


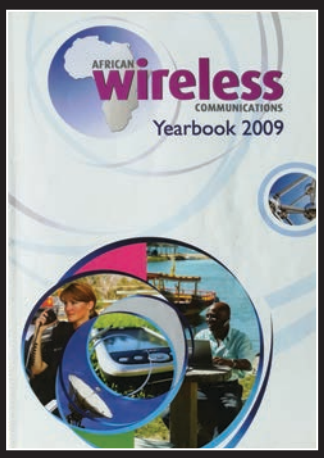


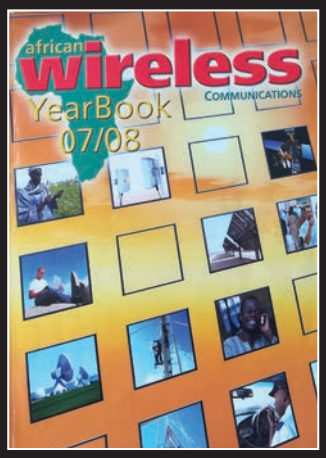


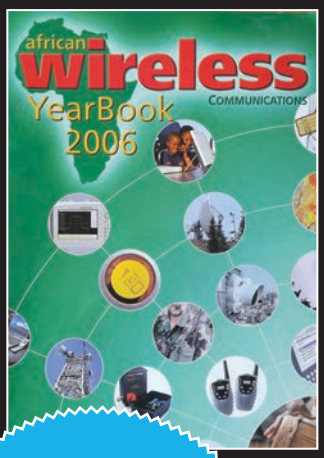












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