For communications professionals in southern Africa

SOUTHERN AFRICAN WIRELESS COMMUNICATIONS

MAY/JUNE 2018 Volume 23 Number 1

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- Wireless users: connecting the next generation
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Mobile Mark is a leading supplier of innovative, high-performance antennas to wireless companies across the globe. They have been in the wireless industry for over 30 years and have roots in the early Cellular trials.

The company design and manufacture antennas from 138 MHz–6.0 GHz. Applications include public transit, commercial trains, smart highways, mining, utilities, remote monitoring, machine-to-machine (M2M), and the Internet of Things (IOT). Antenna styles include omni-directional and directional infrastructure antennas for network rollout; multiband mobile antennas for fleet management; low-profile and embedded antennas for M2M/IOT applications.

Mobile Mark antennas are manufactured in the USA and UK. Their responsive manufacturing capabilities and production controls ensure that antennas are delivered on time and to spec. Their experienced engineering design group can take a project from initial concept through to final production. They also offer in-house engineering design and RF testing facilities for custom designs.

To find out more about Mobile Mark, turn to page 13.

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MobileMark
antenna solutions

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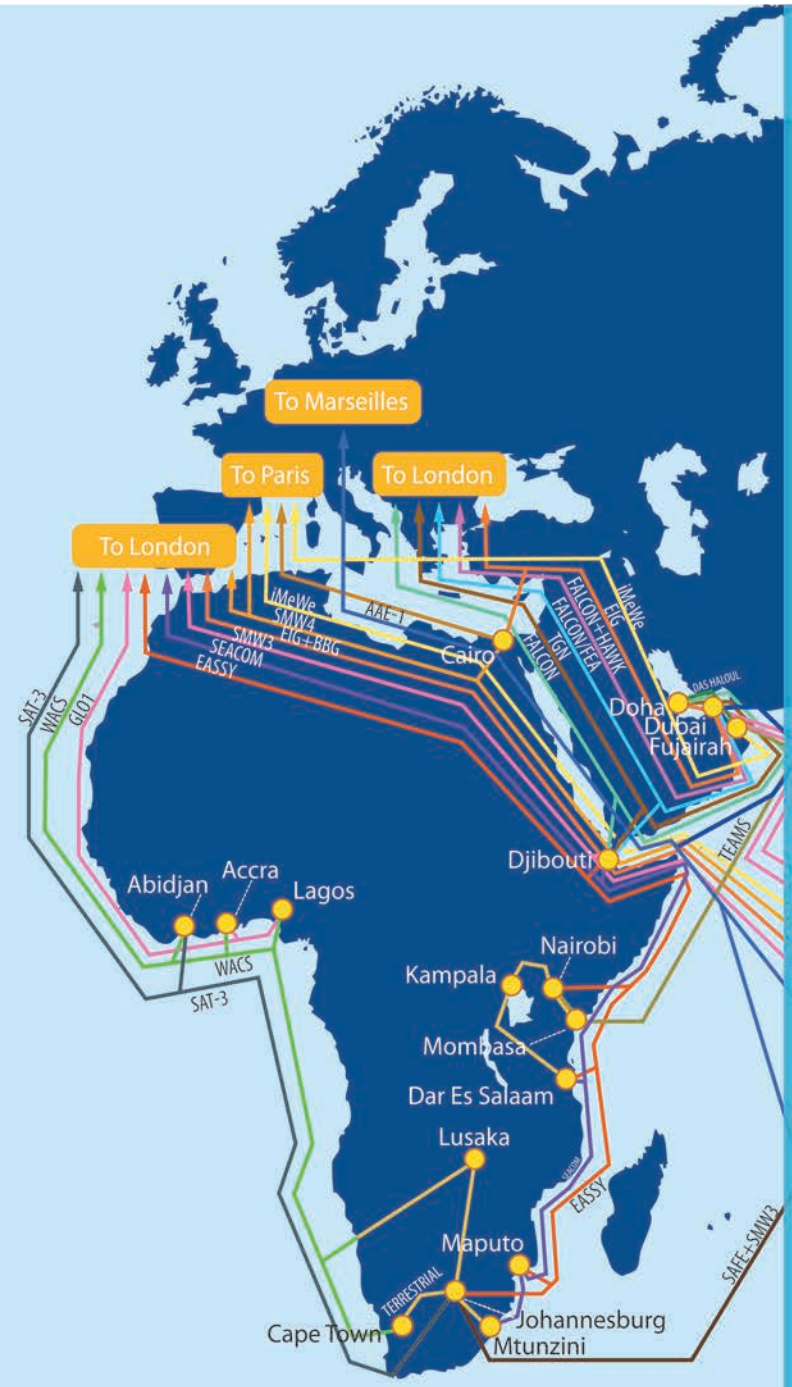

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ICASA gives operators one month to comply with new regulations

South African MNO Cell C has taken legal action after the country's regulator gave operators just one month to comply with an amended version of the End-User and Subscriber Service Charter Regulations (ESSCR).

ICASA said changes to the End-User and Subscriber Service Charter Regulations were needed to protect consumers from a lack of transparency on out-of-bundle charges that often leads to bill shock.

On 7 May 2018, the Independent Communications Authority of South Africa (ICASA) published its amendments to the regulations and said they would come into force on 8 June 2018.

According to ICASA, the ESSCR of 2016 needed to be amended because of general concerns about the unfair business rules imposed by licensees in the provision of data services to consumers. "In particular, the regulations seek to grant consumers relief against expiry of data, bill shock occasioned by lack of transparency on out-of-bundle charges and other rules which are prejudicial to consumers," said the authority.

Cell C said that while it is "fully committed" to complying with the new regulations, prior to the amendments being published it advised ICASA that it was "technically impossible" to meet the proposed timeline. In a press statement released on its website on 7 June, the operator said: "Cell C's billing and other technical platforms are highly complex and rely on one another to operate effectively which means that a change in one system often results in changes being required in other systems. Furthermore, changes to the billing system require a cycle of development to ensure rigorous governance and control measures are met."

The statement added that at least six months would be needed to properly comply with the new regulations, and without disrupting customers and causing unforeseen consequences.

Cell C claimed it did not receive any response about the matter from ICASA. As a result, the operator urgently applied to the South Gauteng High Court to seek a postponement of the ESSCR's implementation.

ICASA refused to grant any requests for extending the implementation of the regulations in the belief that this would not be in the public interest. It said: "The effect of the extension would be that consumers will continue to be prejudiced by the continued application of the impugned business rules. This would mean consumers will, for the foreseeable period of the extension, not be able to carry over their unused data and will continue to be charged high out-of-bundle rates without their consent."

The authority opted to defend the application by Cell C. It therefore announced a postponement of the effective date of enforcing the ESSCR until the matter has been heard and pronounced upon by the court. It added that during the intervening period, licensees would not be penalised for non-compliance.

Satellite specialists combine expertise to connect underserved areas

Global Telesat is joining forces with SatADSL, and RascomStar to connect Africa in a partnership deal that promises to see new C- and Ku-band services launched at "ultra-competitive" prices.

Under the agreement, Global Telesat will manage the services from its teleport in Alicante, Spain. From there, the firm can connect its iDirect *Evolution* hub to SatADSL's *Cloud-based Service Delivery Platform* (*C-SDP*), enabling it to offer a range of services all without investment in any physical infrastructure. RascomStar will supply the capacity using its RQ1R satellite positioned at 2.9°E and offers pan-African C- and Ku-band connectivity.

"We are committed to providing reliable connectivity anywhere at any time, even in the most challenging locations," said Laure Gathy, new business development manager at Global Telesat. "SatADSL's solutions are a perfect fit for our customers who cannot rely on terrestrial infrastructure to connect, and the *C-SDP* means we can offer services quickly and very cost-effectively."

Global Telesat is the latest service provider to connect to SatADSL's innovative *C-SDP* which was launched last November and is now being used by 76 Africa-based partners.

According to SatADSL, the platform enables CSPs to offer, for the first time, cloud-based satellite services over any frequency band. It includes a network management system which allows IP traffic to be shaped and routed from and to different hubs, while a built-in customer management tool allows users to manage and monitor their own customers. It also features a hotspot management system to enable remote hotspot networks to be configured, managed and monitored.

Global Telesat will manage the services from its teleport facilities in Alicante, Spain.

In a separate deal, SatADSL has also teamed up with Cameroon's incumbent telco, Camtel, to provide satellite connectivity across the country.

The formal agreement follows a pilot launch of SatADSL's range of satellite connectivity solutions across a variety of public and private enterprises and communities in Cameroon, including schools, post offices, hospitals and banks.

The company now plans to integrate and deploy its VSAT services nationwide, enabling Camtel to offer competitive broadband packages to even the most rural areas. Under the agreement, SatADSL will fulfil all of Camtel's satellite connectivity requirements across all frequency ranges, Ku-, Ka- and C-band.

Camtel CEO David Nkoto Emane said: "We chose to partner with SatADSL because its solutions will enable us to target the widest possible spectrum of end-users, meaning the broadband services will truly benefit entire communities."

Rapid Deployment Solution aims to save time and money

Webb Industries has developed a telecoms mast which it claims does not require concrete or any excavation, and has a very low environmental impact.

The South Africa-based RF ancillary equipment specialist says its *Rapid Deployment Solution* (*RDS*) has a load capacity of 8m² over the top 10m which makes it possible for multi-customer use, and that it can be reused, relocated and erected on almost any site, both urban and rural.

Webb engineer Mike Kruger says that while a standard greenfield site takes 21 days or more to complete, an *RDS* mast that is, for example, 36m in height, can be fully deployed in three days, resulting in a significant price and 'time to market' advantage.

Left: Webb says this site with a 36m mast was fully deployed in three days. Right: the foundation consists of a steel platform base that is filled with suitable compactable material. No concrete is used.

The *RDS* includes a 7.2m x 7.2m base substructure, tower, fencing, universal equipment cabinet, all underground ducting, full-site earthing and an aircraft warning light system. "In essence, all that has to be done is to bring power to the site, draw the cable through the ducting sleeve, and the system is ready to go," says Kruger.

Webb says its solution saves on rigging and installation costs due to short time spent on site, and that erection is quick and easy without the need for a crane.

Kruger adds that there are further cost advantages because there is no concrete used in the structure's foundation which consists of a steel platform base that is filled with suitable compactable material.

Avanti helps create digital citizens in Tanzania

Avanti Communications says it has closed the digital divide for 18,000 teachers and 216,000 students in Tanzania with its *iKnowledge* project.

The initiative, which has now been running for three years, has connected more than 310 primary and secondary schools across 25 regions in the country. Through satellite broadband connectivity and ICT training, Avanti says teachers can access the latest educational content online and deliver it straight into classrooms.

The connectivity is delivered via the operator's *HYLAS 2* satellite which it says provides 100 per cent coverage of Tanzania. Broadband is installed and supported through local ISPs, while the ICT hardware, digital skills training, and educational content are delivered in partnership with Camara Education Tanzania and Discovery Learning Alliance.

Graham Peters, Managing Director of Avanti Government, said: "Through Avanti's high-speed satellite broadband, innovative thinking and collaboration with our project partners, *iKnowledge* has made teachers and pupils digital citizens of Tanzania."

iKnowledge is co-funded by Avanti and the UK Space Agency's International Partnership Programme (IPP). It is supported by international and local partners including Tanzania's Ministry of Education, Education Authority, President's Office Regional Administration and Local Government and Universal Communications Service Access Fund.

According to the UK Space Agency, the IPP leverages UK space expertise to deliver "innovative solutions to real-world problems across the globe".

Connecting the education sector – Wireless Users, pp26-28.

Cambium delivers heroic performance for HeroTel

Wireless ISP HeroTel is said to be meeting "overwhelming demand" for its services with the help of hardware from Cambium Networks.

Founded in 2013, HeroTel is said to be the country's largest WISP and offers its subscribers connectivity via high-speed wireless, fibre and LTE. The company currently has more than 2,000 sites and more than 45,000 clients for last-mile internet service, but found it was unable to keep up with booming demand for TV streaming services such as *Netflix* and *Showmax*. HeroTel's CCO Rich Henn says: "Traditional last-mile mediums like copper can't keep up, and fibre is limited to deployment in isolated pockets."

After evaluating alternatives, the company chose Cambium Networks' *ePMP* point-to-multipoint wireless broadband distribution system to improve network performance and enable scalability.

HeroTel has deployed the vendor's point-to-point licensed microwave backhaul solutions, *PMP 450m* wireless distribution networks, *cnPilot* 802.11ac Wi-Fi access solutions, and is now extending connectivity and coverage with *ePMP Elevate* and *cnMaestro* end-to-end management.

It's claimed Cambium's ePMP system has "completely transformed" the ISP's network performance.

ePMP Elevate is designed to interoperate with previously installed CPE by changing the access point at the head end and applying an over-the-air firmware upgrade to the CPE. Cambium says it gives HeroTel the ability to "gracefully integrate" and migrate its legacy network.

The WISP is also using the *ePMP 2000 AP*. Cambium says this brings key technologies such as GPS sync, frequency re-use, intelligent filtering, air fairness scheduling, and smart beamforming to an existing 802.11n-based network.

It's claimed the new system has completely transformed network performance. Cambium says HeroTel is now achieving more than three times the speed and more than double the number of subscribers per sector than it achieved in the past. As a result, the company is able to offer 40Mbps SLAs, handle peak traffic volumes, and meet the spikes in demand during evening hours which are driven primarily by Netflix.

"With Cambium Networks' solutions we are able to deliver high-speed wireless services to all of our clients, regardless of whether they are located in urban or rural areas," says Henn.

Webb's RDS mast system on show in Johannesburg, South Africa

Webb's innovative Rapid Deployment Solution saves time and money

South Africa's Webb Industries' Rapid Deployment System (RDS) is a multi-user site solution which does not require concrete or any excavation and, to top it all, has a very low environmental impact.

The main advantage of the RDS is the speed with which it can be installed. It takes only 1-4 days to erect depending on the size.

Designed by South Africa's Webb Industries the RDS can be reused, relocated and erected on almost any site, both urban and rural and can be used wherever speed is the main requirement.

Users include GSM operators, the Police Services and event organisers for concerts, sports tournaments, political rallies and much more.

The RDS serves a vital role in giving telecoms operators time to generate revenue while they wait for a more permanent solution.

Some of the more important advantages of Webb's RDS are:

- Helps to overcome site acquisition constraints
- Saves on rigging and installation costs due to short time spent on site
- Speed and ease of erection (i.e. no need for cranes)
- Suitable for both urban and rural sites
- Easy handling, very flexible and can be reused or relocated
- Above ground foundation, low soil-bearing capacity
- Compact site footprint, up to a maximum of 6m x 6m

SMC's Hilomasts from Webb can be used anywhere, anytime, any place

SMC's Range of Pneumatic Telescopic Hilomasts from Webb are a hit … … anywhere any time

Hilomast telescopic masts, distributed in southern Africa by Webb Industries, are unusually versatile and can be used almost anywhere, anytime and in any place. The mast can be extended up to 30m by using low pressure air which is supplied either from a compressor or in the case of smaller masts from a foot pump.

Hilomast has long been established as a world leader in pneumatic mast technology and in addition to providing a supporting mast for mobile or semi-permanent communications systems, the product is particularly appropriate to those involved in security, surveillance and high-level filming or camera work.

Hilomast, a product of the SMC Group, has been around for more than 30 years and is fully supported by Webb throughout southern Africa.

For more information contact Webb Industries in South Africa on +27 11 719 0000 | www.webb.co.za

webb industries

JASCO

SA scientists aim to bridge digital divide with home-grown technology

A team of international researchers at the University of the Witwatersrand in Johannesburg (Wits) believe free space optics (FSO) will address the problem of bridging Africa's digital divide.

While FSO is not new technology, the Wits team believe innovations in 'sustainable' photonics technologies such as FSO links and solar-powered equipment provide developing countries with new cost-effective opportunities for deploying future-proof telecoms networks.

The new research is being coordinated by Professor Andrew Forbes from the School of Physics and Professor Ling Cheng of the Electrical and Information Engineering department.

A prototype of the device that could connect remote places to fast, reliable internet is tested by the team at Wits University.

PHOTO: WITS UNIVERSITY

Forbes says: "What we are doing is to incorporate two aspects not traditionally part of FSO: mode division multiplexing using several 'patterns' of light at once to increase the bandwidth; quantum security, so that we have a hybrid classical-quantum link."

Cheng adds that while existing FSO systems are able to comfortably sustain gigabit connection speeds over multi-kilometre distances, with further research and development into advanced digital signal processing and coding schemes, this may be increased "dramatically with relatively little expense".

The Wits team are concentrating on connecting communities with FSO links which they describe as a network of communication channels through air, much like Wi-Fi but much faster and with a longer reach. They are working towards a multi-hop FSO link that will cover tens of kilometres.

"Light holds tremendous promise for fast connections across medium distances," says Forbes. "Even Google, Facebook and SpaceX have exotic proposals for Africa that include drones and other aerial vehicles delivering connections in a blanket manner. We are working on point-to-point solutions with sustainable photonics that are home-grown."

The team says it has already made several technical advances and is about to embark on a commercialisation programme with a locally listed firm.

Zamtel offers network with widest coverage in Zambia

State owned Zambian operator Zamtel has commissioned the first ever tower in Dundumwezi in Kalomo, Southern Province. More than 20,000 people in the area will now finally be connected to the world via telecoms.

Speaking at the launch event in early May, Zamtel CEO Sydney Mupeta revealed that the Southern Province will receive a total of 98 sites out of which eight are already on air at various schools in the region.

He said: "This is an inclusive project that is connecting more and more places that never dreamt of having any network coverage at all."

The deployment in Mubanga Secondary School in Dundumwezi followed another tower being commissioned in early May at Kafumbwe Boarding School in Katete, Eastern Province. Mupeta said the launch will foster national development and was significant for Katete which is an agricultural and transit town for traffic heading to Malawi in the east and Mozambique in the south. 113 towers are planned across the Eastern Province.

These latest launches are part of the 1,009 new towers that are being built under phase two of Zamtel's USD280m tower project. The operator said that more than 87 towers across the country have so far been switched on, and claimed that this affirms its position as the fastest growing network in Zambia with a geographical presence in more places than rivals which include Airtel and MTN.

Southern Province minister Edify Hamukale (centre) and local MP Edgar Sing'ombe (left) were among the attendees at the ceremonial commissioning of the tower in Dundumwezi.

Nashua Mpumalanga rolls out free public Wi-Fi

In what's claimed to be a South African first, Nashua's franchise in Mpumalanga has launched a free public Wi-Fi service in Nkangala District Municipality.

Since 1 May 2018, every resident and visitor to all six local municipalities in the district has been able to sign up for 250MB of free data per device absolutely free of charge. They have a month to use the data and can then sign up for another 250MB at the beginning of the following month.

Nashua says that if users run out of data during the course of the month, they will be able to purchase an additional 1GB for ZAR90 (USD6.8). It says that's a "significant saving" compared to MTN's ZAR160 (USD12.11) or Vodacom's and Cell C's ZAR149 (USD11.27).

Mtho Xulu, a director at Nashua Mpumalanga who is spearheading the project in collaboration with Nkangala District Municipality, says: "This is a completely greenfield project but it's also only just the start. Our goal is to ultimately roll out the offering to the entire province."

Xulu describes the initiative as a "proper" public-private partnership with a genuine developmental goal. He says that while other "so-called" free public Wi-Fi offerings such as those offered in Tshwane are actually funded by ratepayers, the Nkangala free public Wi-Fi offering is entirely privately financed by Nashua Mpumalanga.

"It's very hard to participate in the formal economy without access to data," says Nashua Mpumalanga MD, Junior van Niekerk. "Many of the province's residents have not been able to access government services, complete online school applications or investigate job opportunities online as a result of insufficient data. Our intention is that this project will open up the economy for more people in Mpumalanga."

Van Niekerk says the project forms part of Nashua Mpumalanga's enterprise development goals as the kiosks where residents can purchase additional data will create jobs.

According to the firm, data costs in South Africa are among the highest in the world, and certainly higher than those of neighbouring Mozambique, Lesotho and Malawi, and six times more expensive than Egypt. It says: "These high costs are shackling economic development at a time when the country desperately needs to grow its economy in order to increase inclusivity and address crippling unemployment."

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Satcoms firms commit to charter

Members of the satellite community have signed contribution agreements with the UN World Food Programme (WFP) on behalf of the Emergency Telecommunications Cluster (ETC), stepping up their commitment to support global disaster relief.

The agreements are the final steps in operationalising the Crisis Connectivity Charter signed in 2015 between the EMEA Satellite Operators Association, Global VSAT Forum, the UN Office for Coordination of Humanitarian Aid, and the ETC.

Signatories from the satellite industry include Arabsat, Eutelsat, Global Eagle, Hispasat, Inmarsat, Intelsat, SES, Thuraya and Yahsat. They have pledged to help the humanitarian community by greatly enhancing their access to vital satellite-based communications when local networks are affected, destroyed or overloaded following disasters.

Under the deal, the firms are now committing satellite equipment and capacity that will be dedicated for humanitarian purposes during emergency responses. Donated equipment will be stored in humanitarian depots located on three continents while pre-allocated bandwidth will cover all regions of the globe.

The ETC, under the leadership of the WFP, will be able to activate the charter when disaster strikes, and identify which pre-planned solutions are available for any given situation in order to meet a 24-hour deployment timeline after a crisis.

SEACOM upgrades its subsea cable system

SEACOM has upgraded its key submarine network system from its Southern and Eastern African coastline landings into Europe at a total capacity of 1.5Tbps.

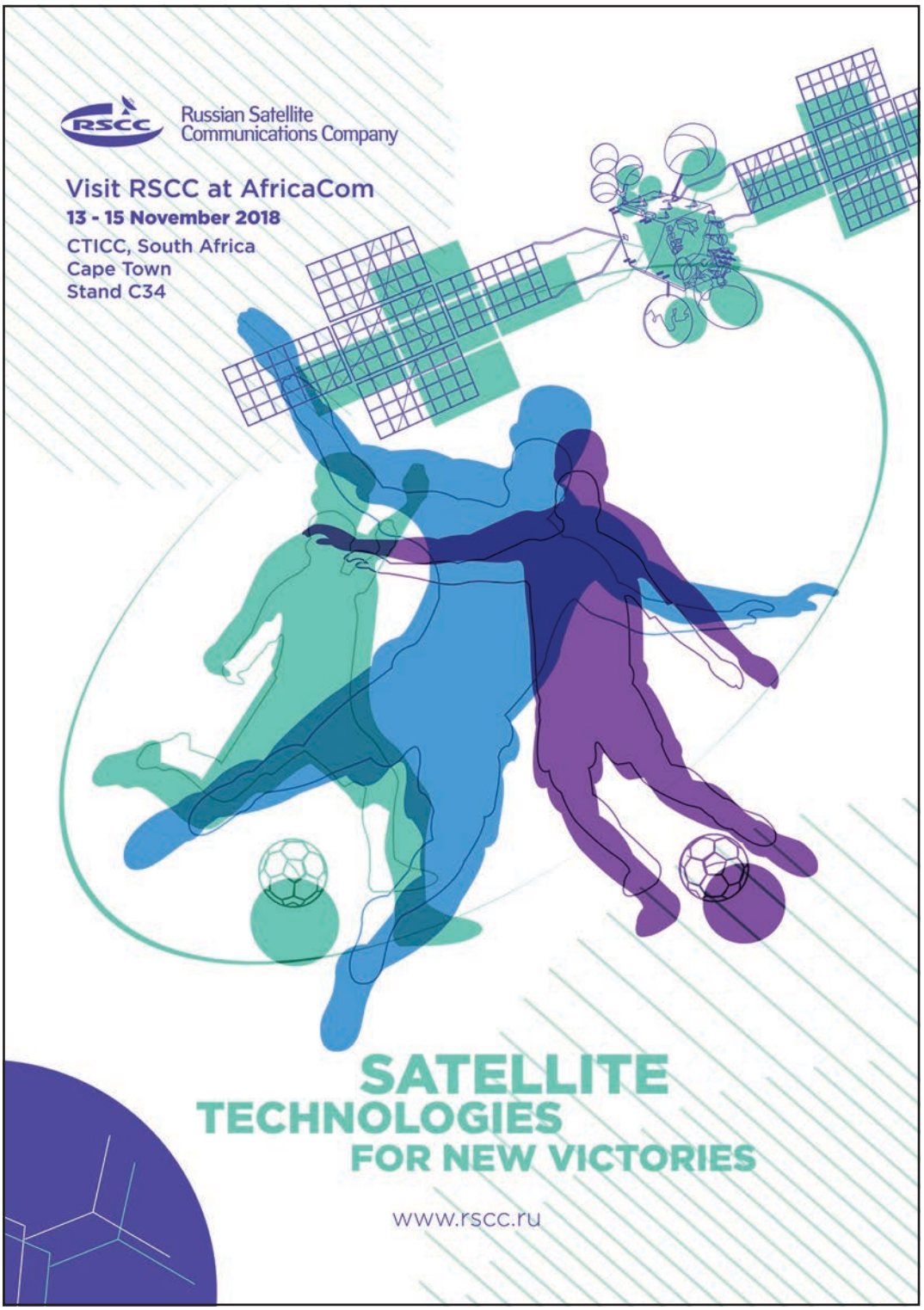
The current upgrade is adding 500G of new capacity on the system, after a previous upgrade of 500G in 2015 (*see News, Mar-Apr 2015 issue*).

The upgrade increases available capacity in SEACOM's key markets: Kenya, Tanzania, Mozambique and South Africa. The company claims the solution will allow it to deliver requirements for high-capacity connectivity in very short timeframes and provide for future demands.

The latest deployment is also based on 100Gbps coherent DWDM technology. SEACOM says this will provide room for it to quickly add more capacity as required.

According to the company, the upgrade falls in line with its focus on driving the development of the African internet and "opening the broadband tap" for the continent's service providers and business users.

"Connectivity services in Africa are booming due to the growing needs of business IT users, the rise of cloud-based services, and growing requirements for the processing and storing of personal data," says SEACOM CTO Claes Segelberg. "This latest upgrade enables SEACOM to meet those demands, and to provide our customers with scalable solutions for the future."



Sanku deploys IoT in its fight against malnutrition

Sanku says its unique dosifier enables micro mills in rural areas to fortify flour with key nutrients during the milling process.

Sanku (Project Healthy Children) is equipping 3,000 small flour mills across Africa with IoT services over the next four years to help provide nutritious fortified flour to millions of people.

Using Vodafone's global IoT SIM and *USB Connect* technology, the organisation is aiming to gain real-time, data-driven insights to help significantly scale its programme and improve efficiency.

Sanku says its uniquely developed dosifier technology enables small African flour mills in rural areas to fortify flour with key nutrients during the milling process in a way that is sustainable and cost-effective.

However, the organisation says that while it takes 25 mills to fortify enough flour to feed 125,000 people, these can only be monitored by a single worker at any one time.

But using Vodafone's IoT SIM now connects the same worker to 100 mills which will fortify flour for 500,000 people. The worker receives alerts remotely and in real-time when the mills run out of flour or require maintenance.

Vodafone adds that its in-country roaming reaches the most remote areas, allowing access to up-to-the-minute information on maintenance, power supply and machine tracking via GPS. Furthermore, *M-Pesa* is being used to enable millers to securely make and receive payments on their smartphones.

Sanku and Vodafone are rolling out the IoT technology to local mills in Tanzania and Rwanda, and plan to implement it across Eastern and Southern Africa where Sanku also runs projects in Kenya, Malawi, and Mozambique.

The organisation adds that its dosifier currently helps provide fortified flour to around a million people and that IoT will help it reach 100 million people by 2025.

Biometric terminals help Zambian farmers spend subsidies

In what's been hailed as a pioneering move for areas that are lacking widespread financial infrastructure, the Zambian government has been able to successfully bring banking and additional funding to farmers in rural regions.

Since November 2017, registered farmers have been able to securely claim subsidies to help pay for agricultural materials as part of the state-funded Farmer Input Support Programme (FISP). Under the initiative, the farmers make a co-payment of ZMK400 (USD40) while the Ministry of Agriculture provides an additional ZMK1600 (USD160).

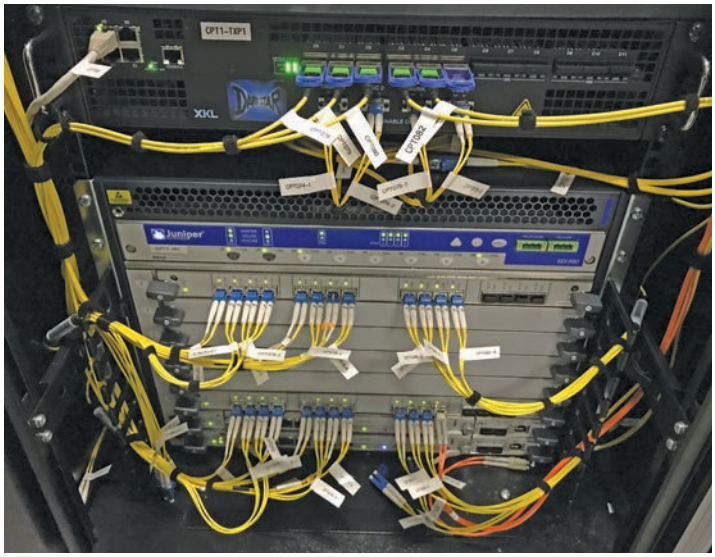
During enrolment, an authorised agent captures the farmers' fingerprints and associates them with their ID for authentication. Users are then issued with an electronic wallet that can be used at participating approved agri-dealers equipped with biometric smart terminals. During the transaction, they can use their fingerprints for authentication.

Smart payment solutions provider Ingenico Group and its long-term partner, South Africa-based fintech firm Paycode, worked closely with the Ministry of Agriculture to design and launch the system.

Paycode COO Sandy Begg explains that the smart terminals connect wirelessly to a central biometric database and also to a centralised settlement system: "We utilised cellular connectivity where it existed through both MTN and Airtel, and temporarily installed satellite communications supplied by a Zambian company, CC systems, in regions without cellular coverage for the duration of the planting season."

As a result of the system, previously unbanked farmers can now access agricultural material subsidies in 30 Zambian districts. The partners says that the FISP has enabled the distribution of USD22m worth of subsidies in rural Zambia within three months, and that 91 per cent of eligible users have already purchased materials using the solution.

TENET to use DarkStar technology for submarine network



XKL says its systems can be combined with one of its DarkStar mux/demux appliances, such as the DMD96 shown here which is claimed to support 96 100G DWDM waves on a single fibre pair.

TENET will use hardware from DWDM optical networking specialist XKL to provide a protected connection between two of its strategic data centre locations in the UK. The interconnection is a critical component of a subsea cable network linking Cape Town to London.

TENET operates the SANReN network which provides the South African higher education and research community with internet connectivity and value-added services. The network comprises national and international POPs that are connected using a combination of dark and managed fibre links at speeds of up to 100Gbps. International high-capacity submarine links connect Cape Town to London via *WACS* and Mtunzini to Amsterdam via *SEACOM*. Transit services are provided via Liquid Telecom in Cape Town and Johannesburg, and via Cogent, NTT and GÉANT in London and Amsterdam.

The organisation will use XKL's *DarkStar* transponder and mux/demux systems. According to the vendor, its systems grow to 36x10G in a 1RU package, and will establish TENET's connection between multi-tenant data centres which connect to *WACS*. It adds that the equipment also provides optical path protection between locations in the event of a fibre break.

XKL also claims its mux/demux equipment enables TENET to simply add new optical transport systems as needed without service disruption using a "pay-as-you-grow" design approach.

MTN offers South Africa IoT services

MTN has launched an automated IoT connectivity platform for all companies looking to provide IoT services to their customers on its mobile network throughout South Africa.

Following on from a partnership deal announced at the end of last year (*see Wireless Business, Jan-Feb 2018 issue*), MTN is working with Cisco Jasper and is the first MNO in South Africa to deploy the company's *Control Center* platform.

MTN says the combination of its network with *Control Center* enables enterprises to securely and cost-effectively launch, manage, and monetise IoT services throughout South Africa, and to scale those services globally as needed. Cisco Jasper says it partners with more than 50 service providers that manage IoT devices across more than 550 mobile networks worldwide. It claims this will allow businesses throughout South Africa to easily utilise its platform to deliver their IoT services to other countries as business demands.

According to MTN, initial customer adoption has indicated "strong demand" for *Control Center* across all industries, with particular interest from the connected car, vehicle tracking, building security and automation, and logistics industries. "It's clear that organisations in every industry are eager to deliver powerful connected services that help transform their businesses," says Mariana Kruger (*pictured*), GM for ICT solutions at MTN Business.

Liquid and Serianu partner for enterprise cyber security

Liquid Telecom and Kenya-based IT security specialist Serianu are teaming-up in an effort to improve cyber security standards and practices across the continent.

By bringing together Serianu's enterprise-focused security monitoring and analytics solutions with Liquid's fibre network, data centres and cloud-based offerings, the partners say they will offer end-to-end protection for businesses of all sizes.

Liquid says it will now be able to offer cyber security assessment, monitoring, training and incident response through a combination of Seriaunu's consulting, managed services and threat intelligence. The company says "advanced" monitoring and incident response services will be made available for customers using its network and data centre facilities, leveraging Serianu's "state-of-the-art" security operations centre in Nairobi.

Customers will also have access to Seriaunu's new Africa Cyber Immersion Centre in the Kenyan capital. It says this research, innovation and training facility provides an experimental environment for businesses to test their cyber security capabilities, and will help address the skills shortage in this area by providing additional training for IT professionals across the public and private sectors.

Serianu CEO William Makatiani said: "Through this partnership, we will explore new ways to empower existing and future customers with quality, home-grown cyber security solutions that will help reduce the risk and cost from cybercrime across the region."

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Al Yah 3 orbit tests

After a tricky launch at the start of 2018 which saw it placed into the wrong orbit (*see News, Jan-Feb issue*), *Al Yah 3* has now successfully completed in-orbit testing. At the end of May, Yahsat announced that its third satellite was ready to launch commercial services from 20°W. It is expected to go live in August. The company says *Al Yah 3* will offer Ka-band coverage to 19 additional markets across Africa and cover 60 per cent of the population, as well as 95 per cent of Brazil's population.

Connecting rural Namibia

Telecom Namibia (TN) has launched high-speed internet and fixed broadband services in rural Opuwo in the Kunene Region. The residents of Otuani, which is around 70km southwest of Opuwo, as well as those in surrounding villages are receiving 100 per cent network coverage via 3G equipment on a 30m tower installed on a mountain. TN says the network covers a radius of 30km. A fixed broadband network has also been deployed to provide telecoms access, mainly to the clinic, school and constituency office.

Africa's biggest IXP

NAPAfrica is now ranked in the top 15 of the world's largest IXPs. Hosted within each of Teraco's carrier neutral data centres in South Africa, NAPAfrica currently has 323 members connecting to more than 350 unique ASNs that service 16 countries. Companies peering content at the IXP, which is said to be the continent's largest, include Google, Akamai, Optinet, Telkom Openserve, amongst others. By 2016, Teraco says peak daily traffic throughput at the IXP exceeded 100Gbps.

ONEm offers mobile users "internet-like" services

ONEm Communications says it can bring internet-like services to millions of mobile users currently without internet connectivity.

The UK-based tech firm plans expansion in Africa through licensing deals and local partnerships. It said the move will see advanced services for rural communities spread throughout the continent.

ONEm claims its technology transforms ordinary voice and SMS into "powerful" interactive tools. The company said it offers a framework for developers to create interactive applications for content and services which are relevant in the local market, and that those applications can be run on any mobiles without the internet.

"Reaching all rural areas needs significant funding and formidable technical challenges," said ONEm CEO Christopher Richardson. "However, the ONEm's solution utilises existing infrastructure to deliver innovative services to rural communities."

According to the firm, governments can deploy its technology as a way to provide rural access to critical services. ONEm said it can provide nationwide interactive services in security, health, education and commerce, and can coordinate their development with the relevant government departments. It added that users only need a basic handset and can get access to vital information interactively using SMS and voice.

ONEm CEO Christopher Richardson (standing right) tries to convince African business leaders to adopt his company's technology.

Intelsat joins Smart Africa alliance

Intelsat has become the latest firm to join the Smart Africa alliance.

Established in 2013 following a manifesto pledge by seven African heads of states, Smart Africa is a commitment to accelerate sustainable socioeconomic development on the continent. The initiative is geared towards connecting, innovating and transforming Africa into a knowledge-based economy.

Smart Africa was endorsed by the African Union in 2014 and is also supported by a number of high-profile private sector partner organisations.

"Satellite technology has played an integral role in providing broadband connectivity throughout Africa," says Dr. Hamadoun Toure, executive director of the Smart Africa secretariat. Intelsat has worked tirelessly over the past four decades to ensure that the people of Africa have access to high-quality, affordable and reliable broadband connectivity."

Intelsat CEO Stephen Spengler adds that while much has been accomplished, more needs to be done. "It is only by working closely with local governments, partnering with other stakeholders throughout the ICT landscape and sharing our knowledge through training, that we will be in a strong position to provide all of Africa with high-quality, affordable broadband connectivity."

More action needed to advance universal broadband connectivity

Rwanda's president Paul Kagame has said Africa's economic transformation requires broadband infrastructure with an emphasis on both access and affordability.

Speaking at the Broadband Commission for Sustainable Development's 2018 Spring meeting held in Kigali in early May, Kagame said: "The reality is that all other digital services, whether in commerce or education or healthcare, run on top of broadband. Africa's size, geography and settlement patterns mean that we must rely on a variety of different technologies to deliver broadband including satellite, fibre optic and mobile."

During the two-day event, 34 commissioners – representing the broadband industry, governments and UN agencies – convened to discuss key issues related to the role of broadband in advancing the sustainable development goals (SDGs).

Rwandan president Paul Kagame said all other digital services run on top of broadband.

PHOTO: © ITU/M. JACOBSON – GONZALEZ

Kagame told the gathering: "It is up to us to lead the way in driving innovation both in policy and business models in order to speed up the provision of broadband where it has been slowest to reach."

Delegates also heard from the Broadband Commission's working group on vulnerable countries which issued a report on national development in four least developed countries (LDCs): Cambodia, Rwanda, Senegal and Vanuatu. It said that despite their different market environments, broadband coverage has increased notably and become more affordable for users in all four countries over the last few years.

However, the report also raises concerns that the demand for broadband and its productive use in LDCs has not matched the growing supply.

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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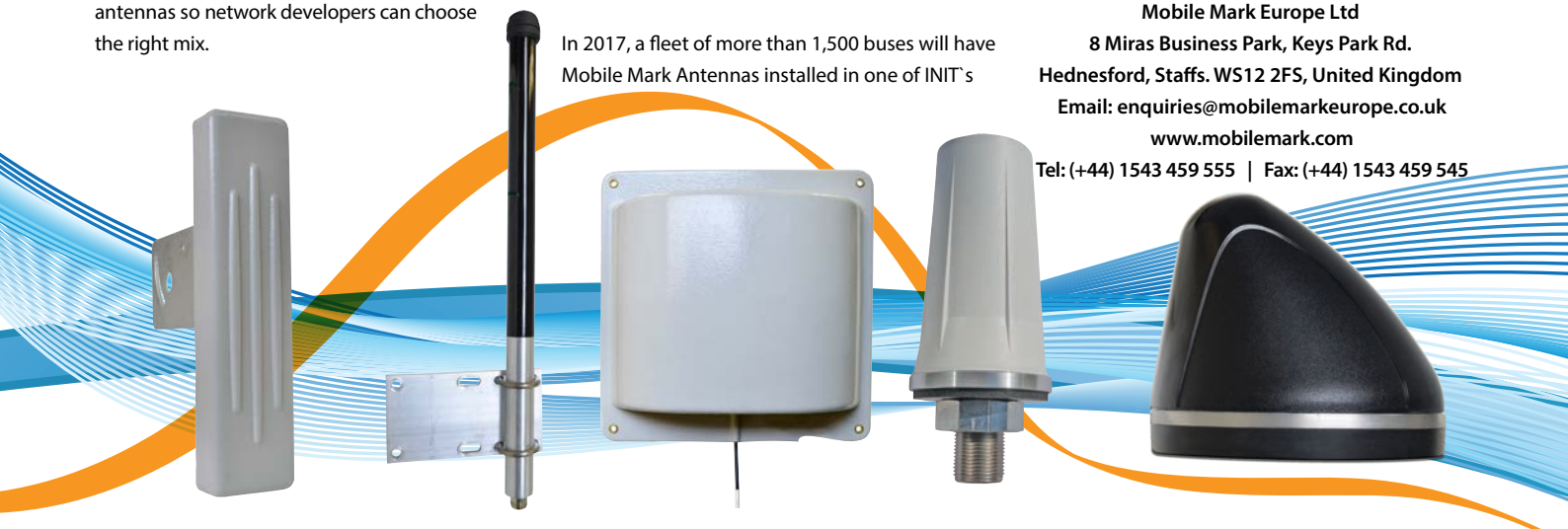

Vodacom Group in ground-breaking ZAR17.5bn BEE ownership deal

As part of what is believed to be the largest ever black economic empowerment (BEE) transaction in South Africa's ICT sector, Vodacom Group will pay out up to ZAR17.5bn (USD1.31bn) to its black investors.

The deal will see the BEE partners exchange their current interests in Vodacom South Africa for a shareholding of between 5.8 and 6.25 per cent in Vodacom Group. The company has agreed terms with Royal Bafokeng Holdings (RBH), Thebe Investment Corporation, YeboYethu (an existing BEE partner) and a newly formed staff scheme. The combined interests will be consolidated into a new YeboYethu BEE structure that will own shares in the group.

This transaction, which remains subject to regulatory and shareholder approvals, will replace and build on the ZAR7.5bn Vodacom SA BEE ownership scheme that was concluded in 2008 and anticipated to unwind on 8 October 2018, ten years after its implementation.

The existing transaction, comprising a 6.25 per cent shareholding in Vodacom SA held by YeboYethu, RBH and Thebe, has benefitted more than 102,000 YeboYethu investors and 8,500 current and past Vodacom SA employees.

The new BEE transaction, in which the YeboYethu shareholding will be substantially increased, will be funded through a combination of third party and vendor financing, reinvested equity of ZAR4.5bn from the existing BEE partners and facilitation from Vodacom Group. It has a 10-year funding term, extending the relationship between Vodacom Group and YeboYethu, as its BEE partner, for at least the next 10 years, with the possibility to extend beyond that period.

4,637 Vodacom SA employees will participate in a new staff scheme funded by the group to the value of ZAR3.5bn. They will own approximately 20 per cent of YeboYethu.

"Our original BEE deal has delivered significant value to our BEE partners. Its unwind will deliver approximately ZAR7.5bn of value, or 6.7x the original capital our BEE partners invested into the 2008 transaction," says Vodacom Group CEO Shameel Joosub. "A shareholder that invested the minimum ZAR2,500 in 2008 will unlock approximately ZAR16,000 of value through this deal."

He adds that part of this value will be returned to existing BEE shareholders in the form of an upfront special dividend of ZAR3bn. "[This] provides substantial liquidity for our partners and amounts to 2.7x the original capital they invested into the 2008 deal. A shareholder that invested the minimum ZAR2,500 in 2008 will receive circa ZAR6,000 in cash."

Vodacom says it is one of the pioneers of social transformation through ICT and is a Level 3 B-BBEE contributor. BEE was established by the ANC government After South Africa transitioned from apartheid in 1994. It aims to address the inequalities of the apartheid era by redistributing assets and opportunities to black and "coloured" South African citizens that were not available to them under white rule.

China Telecom and Liquid Telecom in "historic" deal

In what's been hailed as a "landmark partnership", China Telecom Global (CTG) and Liquid Telecom will work together to provide Africa and Asia with what they say are "industry-leading" network solutions and services. The companies said their "historic" strategic agreement will enable them to serve their respective enterprise and wholesale customers with extended network coverage across some of the fastest-growing economies in the two regions.

CTG has already established a PoP at Liquid's *East Africa Data Centre* (*EADC*) in Nairobi. In a separate announcement made earlier in April, Liquid said it had opened a new floor at the centre to provide an additional 500m^2 of rack space. The EADC now offers a total of 2,000m^2 of secured space over four floors, and is interconnected with Africa Data Centres' other carrier-neutral facilities in South Africa and Zimbabwe. CTG plans to establish further PoPs at the company's facilities in Johannesburg and Cape Town.

Changhai Liu, MD of China Telecom (MEA), says Africa is very important to his company and describes it as the "booming new market" with the highest development rate after Asia. He said: "This collaboration will enable both CTG and Liquid Telecom to better serve our customers and explore untapped business potential for further development. Under this partnership, we are well positioned to enhance the connectivity and network infrastructure in both regions."

ZTE says US ban will "severely impact" its survival

The US Government has banned companies and individuals in the country from exporting products to Chinese telecoms giant Zhongxing Telecommunications Equipment Corporation, better known as ZTE.

On 16 April 2018, the Department of Commerce's Bureau of Industry and Security (BIS) imposed a denial of export privileges in response to what it claimed was ZTE's "repeated false statements". The order prohibits any business or individual in the US to participate in any type of export transaction with the company.

ZTE reportedly spent more than USD2.3bn on imports from around 200 US firms in 2017, which includes vital components for its equipment.

According to the Department of Commerce, in March 2017 ZTE agreed to a combined civil and criminal penalty and forfeiture of USD1.19bn after "illegally shipping telecommunications equipment to Iran and North Korea, making false statements, and obstructing justice including through preventing disclosure to and affirmatively misleading the US Government".

In addition to these monetary penalties, it said ZTE also agreed a seven-year suspended denial of export privileges, which could be activated if any aspect of the agreement was not met and/or if the company committed additional violations of the Export Administration Regulations (EAR).

The department said it now believes ZTE made false statements to BIS during settlement negotiations in 2016 and during the probationary period in 2017 related to senior employee disciplinary actions the company said it was taking. It added that the company's "false" statements only came to light after BIS requested information and documentation showing that employee discipline had occurred.

"These false statements covered up the fact that ZTE paid full bonuses to employees that had engaged in illegal conduct, and failed to issue letters of reprimand," said US secretary of commerce Wilbur L. Ross, Jr. "Instead of reprimanding ZTE staff and senior management, ZTE rewarded them. This egregious behaviour cannot be ignored."

ZTE suspended operations following the ban. On 20 April, the company issued an online statement which said: "The Denial Order will not only severely impact the survival and development of ZTE, but will also cause damages to all partners of ZTE including a large number of US companies."

The firm said that export control compliance is regarded as the "foundation" of its operation, adding that in 2017 alone it had invested more than USD50m in its export control compliance programme with more resources planned for 2018.

ZTE's statement continued by saying that the BIS had "unfairly imposed the most severe penalty" and that it was disregarding a number of facts. These included: ZTE self-identifying the issues in the correspondence and self-reporting them; the company having already taken measures against the employees who might have been responsible for the incident; the immediate implementation of corrective measures.

The firm said that it will not give up its efforts to resolve the issue through communication and, if necessary, through legal measures.

But even before the BIS had announced the denial of export

privileges, president Donald Trump looked set to intervene in the matter. In a Tweet on 13 May, he said: "President Xi of China, and I, are working together to give massive Chinese phone company, ZTE, a way to get back into business, fast. Too many jobs in China lost. Commerce Department has been instructed to get it done!"

A second Tweet the following day said: "ZTE, the large Chinese phone company, buys a big percentage of individual parts from U.S. companies. This is also reflective of the larger trade deal we are negotiating with China and my personal relationship with President Xi."

Separately, and at the same time as the US announced its ban, the UK's National Cyber Security Centre (NCSC) issued a warning about the potential use of ZTE equipment and services in the country's telecoms infrastructure environment.

In mid-April, the centre's technical director Dr. Ian Levy wrote to telecoms organisations with advice about using the company's products. "It is entirely appropriate and part of NCSC's duty to highlight potential risks to the UK's national security and provide advice based on our technical expertise," said Levy. "NCSC assess that the national security risks arising from the use of ZTE equipment or services within the context of the existing UK telecommunications infrastructure cannot be mitigated."

Global IoT connections to reach 50 billion By 2022

The total number of connected IoT sensors and devices is set to exceed 50 billion by 2022, up from an estimated 21 billion in 2018, according to Juniper Research.

In a recently published report, *The Internet of Things: Consumer, Industrial & Public Services 2018-2023*, the firm predicts that a substantial proportion of the estimated 46 billion industrial and enterprise devices connected in 2023 will rely on edge computing.

"IoT at the edge dramatically increases project scope and value," says research author Steffen Sorrell. "However, it must be noted that work around standardisation, interoperability and how to manage the decentralisation of data processing remain in development."

Juniper also forecasts that consortium-run blockchains or similar distributed ledger technologies, such as IOTA, will play an important role in delivering future IoT events or payment transaction management.

However, it also points out that both approaches presently lack true decentralisation offered by public blockchains, a key requirement for end-to-end trust. Juniper believes opportunities for blockchain technologies in the IoT will remain limited until such issues were resolved.

As part of its research, the firm names the top five IoT vendors as: IBM; Microsoft; Intel; Bosch; and Nokia. While it notes that IBM's breadth of services and investment in its *Watson* platform has "paid off", it reckons Microsoft's "tremendous growth in the enterprise cloud space, its IoT edge services and AI prowess highlight an increasingly compelling offer in the market".

Cenerva to boost regulatory training in emerging markets

Telecoms consultancy Cenerva has acquired the *Interconnect Communications Telecoms Regulatory Master Class* (*TRMC*) training assets from InterConnect Communications, a wholly owned subsidiary of Telcordia Technologies. Financial details of the transaction were not disclosed.

According to Cenerva, the deal will give its clients the opportunity to access courses on global best practices on a wide array of regulatory topics such as spectrum management, IoT, internet governance, etc. It said these will help regulators in regions such as Africa, Asia, the Middle East, Central America and the Caribbean to develop frameworks and policies that make telecoms technology work in their local environment. It claimed that this will also help enable operators to engage with regulation in a way that promotes both economic and social benefit.

Since its launch in 2000, *TRMC* has developed into a suite of 11 courses. These are said to have been attended by more than 2,000 students from operators and regulatory bodies from more than 60 countries. The courses have largely been held in the UK but under Cenerva they will also be run in-country.

Cenerva co-founder and principal consultant Professor H. Sama Nwana said: "We plan to bring high-quality, industry-ready training closer to our customers, conducting more in-house and regional courses to get to the heart of what they need to do to encourage digital transformation. These courses lay the foundation for us to expand to accommodate the growing need for training on areas like Blockchain, OTTs, Big Data and cyber security."

IN BRIEF

Ecobank is working with MTN on expanding a longstanding partnership aimed at driving financial inclusion. Under an MoU signed in early April, Ecobank and *MTN Mobile Money* customers will

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
17/4/18	G+D	Germany	FY17	EUR	2.14 (bn)	130	NA	A YoY earnings rise of more than 2% means G+D (Giesecke+Devrient) exceeded the record revenue achieved in the previous year, with a rise of more than 2%. "In our four core areas – payment, connectivity, identities, & digital security – we are in the strongest position we've ever been," said CEO Ralf Wintergerst.
24/4/18	Airtel	India	4Q18	INR	19,634 (crore)	7,034 (crore)	5.34	Total revenues down 10.5% YoY with pre-tax profit crashing at -64.7% YoY. Africa revenues up 10.7% YoY, led by strong growth in data & mobile money transaction value. Acquired Tigo Rwanda during the quarter – financials & operational parameters of the combined entity part of consolidated results.
26/4/18	Nokia	Finland	1Q18	EUR	4.924	NA	(0.06)	Reported net sales down compared to 1Q17 which saw EUR5.3bn. Networks division brought in reported net sales of EUR43m, an 87% fall from EUR324m reported in 1Q17. Net sales in MEA came in at EUR426m, a 6% rise from EUR403m in 1Q17.
1/5/18	American Tower Corp.	US	1Q18	USD	1,742	1,062		Total revenue increased 7.8% while property revenue increased 7.3% to USD1,710m.
10/5/18	Allied Electronics Corporation (Altron)	South Africa	FY18	ZAR	14.7 (bn)	1.1 (bn)	1.35	Chief executive Mteto Nyati attributes 14% revenue rise to execution of the 'One Altron strategy' which promotes cross-selling across firm's eight business units to offer customers integrated, end-to-end technology solutions.
14/5/18	Eurtelsat	France	3Q17-18	EUR	337	NA	NA	Revenues down 3.3% like-for-like (-7.4% reported). Earnings (at constant currency & perimeter) expected to return to slight growth from FY 2018-19 onwards; EBITDA margin (at constant currency) expected above 76% for FY 2017-18.
15/5/18	Vodafone	UK	FY18	EUR	46,571	14.7 (bn)	8.78	Group revenue down 2.2% to EUR46.6bn, with earnings in MEA & APAC down 2.6% to EUR11,462m. However, Vodacom Group service revenue increased 5%, supported by strong customer additions & data growth in South Africa, as well as growing data demand & *M-PESA* in International operations which include Mozambique, Lesotho, DRC & Tanzania. These represent 22.2% of Vodacom Group's service revenue & grew 8.3% in the year. Meanwhile, Egypt service revenue grew 20.7%; no mention of Vodafone Ghana's performance.

be able to transfer money between mobile money wallets and bank accounts The two companies say they will also leverage each others assets to digitise international remittance, foster product innovation in the field of mobile saving and lending, and offer digital payment solutions to consumers, merchants and corporations. Ecobank Group CEO Ade Ayeyemi says Africa will need to digitise financial services to "rapidly" scale-up client acquisition and patronage.

Global smartphone demand fell two per cent to 347 million units in 1Q18, according to the latest data from GfK. But in the Middle East and Africa, demand rose two per cent to 44.1 million units as consumers continued to upgrade from feature phones to smartphones. GfK says this was driven by Egypt and South Africa which each saw YoY growth of 42 and 13 per cent, respectively. The firm forecasts unit demand to increase four per cent in the region in 2018. Meanwhile, smartphone revenue for the quarter in MEA increased seven per cent YoY to USD 11.4bn.

American Tower Corporation (ATC) will acquire up to 723 towers from Telkom Kenya. The operator's CEO Aldo Mareuse, said the sale will release capital for further investment in 4G as well as "a number of state-of-the art IT platforms" to enhance services for customers. The value of the deal was not disclosed. Established in April 1999, Telkom is 60 per cent owned by Helios Investment Partners with the remaining stake held by Kenyans through the Government of Kenya.

The GSM Association has halted the development of the latest eSIM standard. The latest version of the standard is being developed with a wide range of features including the option for the eSIM to be locked. However in the US, consumers would need explicit consent under specific commercial agreements with their mobile operator to do this. The GSMA said development is now on hold, and that it is cooperating fully with the US Department of Justice's investigation into the matter.

Mobile connectivity provider iPass has announced a seven figure deal with Lycamobile, claimed to be the world's largest international MVNO, to provide global Wi-Fi to its monthly plan customers. The service will be available to Lycamobile's subscribers through a white-labelled version of *iPass SmartConnect* which is said to provide "simple and secure" Wi-Fi access to millions of hotspots worldwide.

Global satellite services and solutions provider Marlink and engineering services company L&T Technology Services (LTTS) have partnered to deliver new IoT solutions that leverage the power of satellite networks for extended connectivity in the world's most remote locations. It's claimed LTTS' smart products and services will be reinforced by Marlink's satellite network and technology expertise through extended reach of IP connectivity for end-users worldwide.

INVESTMENTS, MERGERS, ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
26/4/18	Yahsat	Thuraya	Majority stake	NA	Size of stake & transaction value not disclosed. Thuraya's two satellites, which are said to serve more than 140 countries, will join the Yahsat fleet, expanding its constellation to five. It can now offer C-, Ka-, Ku- and L-band services to Africa, Middle East, Asia, Europe & South America.
27/4/18	Orange Digital Ventures	Africa Talking	Investment funding	USD8.6m	Nairobi-based Africa's Talking specialises in providing access to operators' communication & payment APIs for developers. Working alongside the IFC World Bank & Social Capital, Orange Digital Ventures has helped the company raise the funding needed to support its clients' expansion strategies. Beyond Kenya, the firm has started working in Uganda, Rwanda, Tanzania, Malawi, Nigeria & Ethiopia.
31/5/18	Ericsson	European Investment Bank	Credit facility	EUR250m	Agreement will support R&D activities for 5G & is in line with Ericsson's focused business strategy. The disbursement can be made in any currency that is widely traded on forex markets, & the credit facility will mature five years after disbursement.

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
6/3/18	Rakesh Bhasin	CMC Networks	Chairman	Colt Group SA	CEO
27/3/18	Jean-Yves Charlier	–	–	VEON	CEO – resigned
1/4/18	Vinod Kumar	Subex	MD & CEO	Subex	COO
10/4/18	Reshaad Sha	Liquid Telecom	CEO, South Africa	SqwidNet	CEO
11/4/18	Ike Dube	Altron	MD for Rest of Africa	MTN South Africa	Head of business risk management
25/4/18	Phil Moses	Liquid Telecom	Group CFO	Arqiva	Group CFO
25/4/18	Gisa Fuatai Purcel	CTO	Director of ICT development	CTO	Regional advisor for the South Pacific
26/4/18	Jean-Claude Tshipama	Eutelsat Communications	Head of Broadband in Africa	Canal+ DRC	CEO
30/4/18	Jan Frykhammar	Openet	Director	Ericsson	Special advisor to the board & to the CEO
2/5/18	Dr. Helmut Reisinger	Orange Business Services	CEO	Orange Business Services	EVP, international
7/5/18	Paul de Leusse	Orange Group	Deputy CEO for mobile financial services	Indosuez Wealth Management	DG
8/5/18	Jatinder Sispal	CMC Networks	EVP of global sales	CityFibre	Head of carrier & national providers
15/5/18	Vittorio Colao	–	–	Vodafone Group	Chief executive – stepping down 1 October 2018
15/5/18	Nick Read	Vodafone Group	Group chief executive-designate	Vodafone Group	CFO
15/5/18	Margherita Della Valle	Vodafone Group	CFO	Vodafone Group	Deputy CFO
17/5/18	Alan Stewart-Brown	Opengear	VP of sales for EMEA	Xirrus	VP of sales EMEA
21/5/18	Rolland Johns	CSG	CFO	CSG	Chief accounting officer
31/5/18	Maria Varsellona	Nokia Corporation	President, Nokia Technologies	Nokia Corporation	Retains her previous position as chief legal officer. Replaces Gregory Lee who is leaving.
31/5/18	Never Ncube	Dandemutande	CEO	Dandemutande	CFO
1/6/18	Jonas Bogoshi	BCX (Business Connexion)	CEO	Dell EMC	Country manager

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What did Hytera achieve in the African Market?

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Migration to Digital in South Africa

Hytera Offers DMR Solution for Buffalo City Metropolitan Municipality

Background

Buffalo City Metropolitan Municipality is located in East London, South Africa. Electrical Department is responsible for the maintenance and repair of the Electrical Reticulation System for East London, Mdantsane, Bhisho and King William's Town areas.

The electrical department was using a mid-band analogue radio system which had been in service for many years and was difficult to maintain and to repair due to the lack of spares available. The system comprised of a mix of brands of analogue equipment, repeaters, mobiles, base stations and portables. The control room was utilizing base stations on various channels and the required area of operation was limited.

Due to the increasing size of the metropolitan, additional staff and equipments are required to carry out the maintenance and repairs. The existing analogue system cannot afford more user capacities as there are too many group conversations as well as individual conversations. At the same time, with more employees, communication and management efficiency are becoming more critical and important for the department.

Their challenge is to find a digital two-way radio system that could supply more than a new walkie talkie. They want a control room with dispatching software with recording and GPS function.

Solution

From 2014 to 2015, M.H. Communications supplied a Hytera DMR conventional network with an advanced dispatching & tracking solution for the department, along with the Hytera Dispatch Software, RD62X VHF Repeaters, PD78XG Portables and MD78XG Mobiles.

The system comprises 5 X RD62X VHF Repeaters linked to 8 X Hytera Dispatch System. Each client using Hytera Dispatch System operates individually and communicates to relevant repeater area. The audio link feature in the Hytera Dispatch System allows the repeaters to be linked as required, allowing communications between areas. As long as the link is not required, it can be disconnected to reduce traffic on the repeaters. This digital radio solution also makes communications possible in places where their analogue radio system does not work.

A site has a digital and an analogue repeater back-to-back connected in order to communicate with sub-contractors who are still using analogue radios. This is easily solved by two RD62X Repeaters, one in digital mode and the other in analogue mode.

Hytera DMR Solution Extends Cross-border Communication

Hytera Facilitates the Mozambique-South Africa Gas Pipeline

Background

In 2002, the South African and Mozambique Governments agreed on a Gas-Pipeline Project. The 865km Sasol gas transmission pipeline ran from Mozambique to Secunda, for the transmission of natural gas to its Secunda processing plant. The gas was sourced from the Pande and Temane Gas Fields in Mozambique. Sasol Petroleum International, the upstream subsidiary of Sasol Ltd., has started up its 63 million gigajoule/year (158 MMscfd) expansion at the Temane, Mozambique; gas processing plant capacity is 458 MMscfd in 2012.The pipeline is 50% owned by Sasol, 25% by the South African government and 25% by the Mozambique government.

However, South Africa's energy demand has been growing fast in its new democracy. Another pipeline was agreed upon running parallel to the current pipeline from Mozambique to South Africa. The first phase of this pipeline 125km was under construction from year 2013.

Solutions

After an extensive site survey was done alongside the proposed route, we have come up with the following solution:
7-Site RD98X Repeaters linked via 5.8 GHz Microwave link;
35-PD78X Portable Radios used by personnel roaming up & down the construction site;
35-MD78X Mobile Radios were mounted in the construction vehicles.

Description

By carefully selecting and planning the correct positioning of the Repeater sites, we have come up with a solution that we connect all the Repeaters via IP-Microwave links to each other. Yagi-Antennas are used to give the range in a straight line that is required to the next repeater.

Roaming function of the Hytera terminals give the advantage to allow the customer to either talk locally (in the same Repeater site) or throughout the network without having to select the repeater you are closest to, thus being able to connect to any radio throughout the network.

Ace communications, a Hytera dealer in South Africa, supports supervision and commissioning during the project. The fast response during and after the project implementation would greatly satisfy the client.

Nature Conservation with Hytera in South Africa

Hytera Helps Game Reserves to Tackle Communication Problems

Background

In Lowveld area of Mpumalanga and the southwestern section of the Kruger National Park, there are a few game reserves and lodges, like the famous Sabi Sabi Private Game Reserve that covers an area of more than 65000 hectares. It's a wildlife oasis, where you can observe at close quarters the age-old natural relationship between the predator and the prey. Day and night safaris in open safari vehicles, led by well-trained game rangers and qualified trackers, follow the animals on and off-road, deep into the heart of the wild African Bushveld.

Communication becomes a tough challenge with the increase of reserves and visitors. More employees and radio channels are required. Managers need to contact and locate their staff members to make sure their safety, and staff members need to communicate with others in case some dangerous and urgent things happen.

Hytera Solution

A digital solution was provided with repeaters of linked IP, as well as a Hytera Dispatch System. Combined networks of 22 RD98X repeaters, about 500 terminals, and 9 Hytera Dispatch Systems were provided for the game reserves.

The products supplied exceeded the customers' requirements.
• The RD98X repeaters make the whole system connected. The 2-slot feature and programmable multi-site linkage ensure communications in game reserves smooth without keeping the entire system engaged. IP connect between repeaters are easily established within the existing IP networks. This is a huge benefit in areas where environmental laws and protocol limit the installation of infrastructures. The MD78XG proves itself among the open game viewers and stays reliable because of its weather proof rating. Rain and dust does not reduce its effectiveness. With the built-in GPS, tracking the game vehicles becomes easy.
• GPS positioning function of portable radios PD78XG & PD70XG helps operators in the control room to track front-line staff's movement, which is an invaluable feature in any emergency situation. The IP 67 rating feature provides flawless communication all the time in those harsh conditions. PD78XG is user-friendly with many user programmable features, allowing the user to perform various functions and to send or receive short data messages.

• Due to the great range of the game reserves, staff need the roaming & handover function when they drive through different areas covered by different repeaters. Hytera's equipment facilitates such features that help them to work more efficiently.

Petro-chemical Industry Uses Hytera

Hytera TETRA System Serves South Africa Petro-chemical Company

Background

Due to the scarcity of petroleum resources, large coal-to-liquid and gas-to-liquid plants(CTL and GTL) were created in South Africa from the 1950s onwards. The plants are used to produce fuels, as well as to provide basic materials for the chemical industry. The Sasol company is a market leader in this area with two large facilities situated in Sasolburg and Secunda in the Free State of South Africa in the North East of the country. Coal is exploited over a large area and partially highly explosion-prone substances are also processed.

Customer Demands

Given the nature of Sasol's activities, it is essential for the maintenance of effective operations that a safe working environment and good monitoring of machines and personnel is provided. Coal mining and processing in Secunda, as well as gas processing in Sasolburg, each consist of a complex sequence of different automated process steps. An error in one of these steps leads to an interruption of the processing chain and, as a result, to potentially enormous losses. A communication system with high voice quality for safe and efficient work is required.

Hytera TETRA Solution

Hytera has been working with Sasol from 2006 and Sasol chose to install a Hytera TETRA mobile radio system in 2013. Extensive redundancy was built into the system elements to guarantee trouble free, continuous radio coverage and capacity, even at peak loads. External applications can be easily connected to the TETRA mobile radio system with multifunctional A-CAPI interface. Powerful SCADA (supervisory control and data acquisition) system was provided to transmit the information via SDS using the TETRA infrastructure.

The four DIB-500 base stations at Sasolburg and 13 DIB-500s at Secunda are connected to the two DMX-500 switching nodes at both sites via ring structures. As a result, continuous mobile radio coverage is ensured over the entire 4,000km^2 company site in Secunda. Both locations feature several base stations that are located outside of the company's sites. This allows the network to reach employees, or the company's own fire crew, who live outside the sites in emergency situations.

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www.hytera.com

Mimosa delivers "superior reliability" for urban backhaul links

Mimosa Networks reckons its *B24* is the first affordable gigabit-speed radio in the unlicensed 24GHz band.

The new device is engineered for a number of urban wireless applications including microPoP backhaul, rooftop-to-rooftop connections for enterprise, campus and multi-dwelling units, as well as video surveillance or smart city connectivity.

Mimosa says the *B24* delivers speeds of up to 1.5Gbps IP throughput, automatically allocating traffic dynamically as needed. It claims the radio offers "superior reliability" for backhaul links of up to 3km, and leverages proprietary *Spectrum Reuse Sync* (*SRS*) technology. This is said to allow up to eight collocated *B24*s to share the same channel, on the same tower or rooftop, each running at 1Gbps.

For redundancy and flexibility, concurrent Ethernet and fibre connections are supported. According to Mimosa, this is a feature that has never been available in products with similar price points.

The vendor adds that in video surveillance applications, the radio offers the "highest quality" video over a wireless backhaul. It says the *B24*'s compact design means it can be placed at surveillance locations without fibre, thereby eliminating the cost and rights-of-way required here.

www.mimosa.co

Ruckus turns networks into single IoT platform

Ruckus reckons its recently launched *IoT Suite* enables organisations to consolidate multiple physical-layer IoT networks into a single and secure one.

It says the suite also speeds ROI and reduces deployment cost by allowing for the use of common infrastructure between the WLAN and the IoT access network.

The *Ruckus IoT Suite* consists of the company's IoT-ready access points, such as the *ZoneFlex R510* pictured here. These accommodate Ruckus' IoT modules to establish multi-standards wireless access for Wi-Fi and non-Wi-Fi IoT endpoints, and translate non-IP endpoint communications into IP. The modules are radio or radio-and-sensor devices that connect to the AP to enable endpoint connectivity based on standards such as BLE, Zigbee and LoRa.

The platform also features Ruckus's *SmartZone* controller that provides a single management interface for both the WLAN and the IoT access network. This is deployed in tandem with a virtual controller which performs connectivity, device and security management functions for non-Wi-Fi devices. It also facilitates endpoint coordination, and provides APIs for northbound integration with analytics software and IoT cloud services.

www.ruckuswireless.com

Beamformimg APs deliver full benefits of Wave 2

According to Zyxel, although the 802.11ac Wave 2 standard uses offers faster speeds and better performance for more users, its MU-MIMO capabilities have been "difficult to achieve without compromising data rates". It says the standard requires robust noise suppression capabilities, otherwise total network performance can be degraded by non-MU-MIMO clients in a group.

As a result, the company believes that early Wave 2 products "fell short" of the performance advances seen with the jump from 802.11n to the 802.11ac Wave 1 standard.

But thanks to what it describes as next-generation beamforming technology, Zyxel reckons its new *NWA1123-AC HD*, *NWA5123-AC HD* and *WAC6303D-S* APs deliver on the full potential of Wave 2 wireless networking. It adds that they enable increased data rates not only for MU-MIMO-compatible clients, but for all existing ones as well.

The firm claims its devices deliver maximum coverage with increased data rates, and feature built-in filters to minimise interference from 3G/4G cellular networks.

The standalone *NWA1123-AC HD* supports a combined data rate of up to 1.6Gbps, as well as *NebulaFlex*, Zyxel's licence-free cloud management system. The *NWA5123-AC HD* is a dual-radio 3x3 MU-MIMO unified AP and also offers a combined data rate of up to 1.6Gbps.

www.zyxel.com

EXFO Ontology automates network troubleshooting

EXFO has launched what it says is the industry's first solution that automatically links performance measurements to network topology. The network test, monitoring and analytics specialist claims its new *Ontology* platform enables service degradation diagnosis in "record time".

According to the company, CSPs have flagged the deficit of automation in service assurance applications and lack of integration of assurance across services and infrastructures as important roadblocks on the road to network operations automation.

EXFO reckons CSPs can use *Ontology* to find the source of severe service disruptions quicker than ever, even those that arise from obscure network transmission problems that can take weeks to pinpoint and require a multidisciplinary team.

The platform's automated common cause analysis module uses insights from EXFO's *Xtract* network/service topology and real-time performance analytics solutions to automate the most labour-intensive steps of the troubleshooting process. It has been designed to automatically detect KPI violations and automatically trigger a topology-driven common cause analysis of these violations. Operators then receive a list of related performance problems and their ranked possible causes.

The platform is powered by EXFO's active graph-based topology engine. The company says this actively tests more than 150 different protocols and services which identify affected populations of users, equipment and services.

Other key *Ontology* features include an ability to digest performance data from the analytics layer, and connect symptom sets from any performance management infrastructure. It also prioritises cause sets that widely explain the failure in the symptom set, then analyses KPI data to find root cause.

www.exfo.com

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WiNDE enables fast, optimised mmWave network designs

Siklu says it's come up with a "breakthrough" software platform that automates complex mmWave network designs and accelerates time to deployment.

The gigabit wireless connectivity specialist's *SmartHaul Wireless Network Design Engine* (*WiNDE*) is part of the *SmartHaul* SaaS application suite that also includes financial analysis calculators and a range estimator tool.

Siklu says the suite of apps gives customers the tools they need to plan a mmWave network from a business case perspective all the way to an actual network design.

WiNDE has been developed to automate the many tasks involved in

designing a complete mmWave wireless network supporting both point-to-point and point-to-multipoint products in a mixed topology. According to Siklu, the "intuitive and easy to use" tool reduces "days of complex work and tedious details to mere hours".

The company says *WiNDE* features a five-step wizard that guides a user with 40 years or 40 days of network design experience to the same "swift" conclusions.

It claims the software calculates thousands of possible designs in an iterative process to optimise the network for performance or cost. The user can specify where the wireline or fibre connections are and utilise this information to derive the optimal network design. The results are presented graphically and numerically for easy evaluation of the outcome.

Siklu says additional *SmartHaul* software tools will be announced over the course of this year.

www.siklu.com

SatixFy supports any antenna and any frequency

SatixFy UK is making some big claims about its recently launched full electronic steered multi-beam array (ESMA) antennas.

ESMA antennas use less power based on waveform duty cycle. If there is no traffic, no power will be needed from the antenna, such as in DVB S2X time slicing.

SatixFy, which describes itself as a designer of next-generation satcom chips and systems, says its scalable architecture supports any antenna size up to one million elements (in Kuband 10m x 10m), any frequency through a dedicated RFIC, any polarisation including circular and linear simultaneously, any shape including conformal arrays, and up to 32 beams, both in receive and transmit.

The company adds that the antenna is based on fully digital beamforming technology and supports an instantaneous bandwidth of more than 1GHz, with an expected array efficiency of better than 70 per cent. ACU, self-calibration capabilities, and an on-chip trigonometric calculator are also included for what SatixFy says is fast tracking and beam steering.

With an integrated modem, the antenna supports various

operational modes such as TDD (half duplex) and FDD (full duplex). It also supports any external modem through L-band interface, but is said to be best utilised when coupled with SatixFy's current 500MHz baseband modem chips (*Sx3000*).

www.satixfy.com

Security suite protects signalling network

Sparkle, the international service arm of Italy's TIM Group, has worked with enterprise security specialist Positive Technologies on a new and full suite of security services for signalling connectivity.

Positive Technologies says its research has shown that 4G infrastructure is vulnerable to the same attacks as older, SS7-based networks. It says critical vulnerabilities in signalling protocols (such as Diameter and GTP) along with network configuration errors provide the means for hackers to perform attacks that can, for example, steal subscribers' data, spy on their locations, commit fraud, and perform DoS attacks.

The *Sparkle Signalling Protection Suite* is claimed to be a "sophisticated" all-in-one package that detects and blocks unauthorised traffic and therefore prevents potential privacy loss, operational instability and revenue losses.

It combines Positive Technologies' telecom security solutions with Sparkle's connectivity and roaming services, and signalling firewall. The companies say they will provide customers with a set of advanced security services such as vulnerability testing, best practice compliance assessment, and security monitoring for real-time detection of anomalous activities.

According to the partners, all this offers complete protection of the entire signalling network perimeter, both national and international. They add that "rich" analytics and reporting capabilities will also enable mobile operators to act immediately and respond to threats in real-time.

www.tisparkle.com and *ptsecurity.com*

Also look out for...

The compact OVAL sensor (left) can communicate over Wi-Fi to the gateway (right) from a distance of up to 150ft away.

Sensor promises to make any object or area instantly smarter

OVAL Digital has launched an all-in-one smart sensor that monitors and detects changes in motion, temperature, humidity, light and water, and quickly sends alerts to a phone or email.

Formed in 2014, the company's aim is to develop a smart sensor for everyone. It launched *OVAL 1.0* in early 2017 across 32 countries, which also included unspecified African nations, and said the product "worked well" in those locations. It has now developed a new sensor that is claimed to be smarter.

OVAL 2.0 can connect to smart home products such as *Amazon Echo* and *Google Home*, and also supports the IFTTT (if this, then that) web service, to connect to hundreds of other devices that provide home automation.

The system comprises small, wireless sensors that do not require home integration or installation, and are said to take only minutes to set up. These communicate to the new OVAL gateway which connects to a Wi-Fi network. Sensors can be positioned up to 150 feet away, and additional gateways can be connected to extend range.

OVAL says the latest version also uses an all new firmware system which has stepped up both the reliability and response time of the sensors, as well as increased their battery life from two months to six months.

In addition, the company has also redesigned the *OVAL* app. It reckons this now includes "powerful" new features such as a real-time view of the sensors and analytics to help users identify trends, and improve behaviours to help increase safety, conserve energy and save money.

Looking for the future in critical comms?

Airbus demonstrates a VR solution to enable firefighters and police officers to ''step into'' emergency situations from remote location using secure communications infrastructure.

PHOTO © AIRBUS

RAHIEL NASIR rounds up some of the latest products to help first responders and other mission-critical users communicate in a crisis.

TETRA deployments increased globally by 16 per cent in 2017, according to data released in May by IHS Markit. The analyst attributed the growth to new TETRA users coming online as well as users in mature markets around the world continuing to refresh.

IHS said public safety accounts for around 60 per cent of all TETRA users, but added that the technology is becoming more popular with business-critical organisations, such as the transportation, utilities and industrial sectors.

The analyst also said that while some question TETRA's longevity, its presence on the world stage continues to grow, and forecasts that the technology will continue to provide mission-critical communications well into 2020 and beyond.

The TCCA (TETRA and Critical Communications Association) said that the 16 per cent increase highlighted by IHS was "well above" the average across LMR/PMR technologies, and that growth was strong in all major geographic regions (particularly Asia which saw deployments increase by 27 per cent in 2017).

Francesco Pasquali, chair of the TCCA's TETRA Industry Group, said: "The market is buoyant for TETRA, with new deployments and operators increasingly using their existing TETRA systems for new data applications to deliver significant improvements in operational efficiency. With the assurance of TETRA being a safe and economic investment, and as dual mode TETRA/LTE terminals and infrastructure come to market, the standard has a strong and stable future."

While plaudits for TETRA are only to be expected from the TCCA, the spotlight continues to shine more on LTE in the critical comms world. IHS Markit said that alongside the growth of LMR digital technologies, private LTE networks have emerged in a number of countries worldwide including Ghana, Kenya and Nigeria, while Angola has opted for a TETRA and LTE convergence solution for its national communications network.

LTE fever

The vendors are certainly focusing on LTE if the raft of new products and innovations announced in the wake of *Critical Communications World* (*CCW*) that took place during mid-May is anything to judge by. For instance, Motorola Solutions has developed what it claims is a "groundbreaking" portable solution that enables first responders to establish high-speed public safety LTE coverage within minutes.

The *LXN 500 LTE Ultra Portable Network Infrastructure* is described as an easy-to-carry, miniaturised, full-power site that fits in a briefcase, backpack or vehicle. The fully functional, standalone LTE network is built on a platform that combines an eNodeB (eNB) and EPC. Motorola said it creates an on-demand LTE "bubble" with a reach of up to one kilometre which scales up to 100 subscribers. It added that with a setup and activation time of around five minutes, first responders can use the system to instantly get the secure LTE coverage and capacity they need, anywhere and anytime.

The *LXN 500* is equipped with built-in GPS and Wi-Fi that can host software applications such as mapping, messaging and video streaming. Motorola said the equipment's compact, IP54-rated design is made for harsh environments, and that roof-mounted external antennas with MIMO configuration provide extended range and performance.

CCW also saw the company unveil the *LEX L11* which is designed for global broadband networks and enables first responders to access secure apps for increased situational awareness.

The new device meets the MIL-STD-810G standard for drop and shock and is IP67 rated. It is equipped with a dedicated PTT and emergency button, as well as a talk group rocker switch and two programmable keys. Motorola reckons these features allow users to blindly access mission-critical capabilities while keeping their eyes up, their hands free and their focus forward.

The *LEX L11* also includes features for reduced distortion, background noise cancelling, and the suppression of feedback caused from other nearby devices using the firm's *Howling Suppression* technology as used in its TETRA handhelds.

Meanwhile, Huawei launched what it said was an "end-to-end solution equipped with ultra-

Above: Motorola Solutions' LXN 500 LTE Ultra Portable Network Infrastructure is a fully functional, standalone LTE network that fits in a briefcase. Left: the LEX L11 LTE handset is designed for use on global broadband networks.

reliable multimedia communications capabilities tailored for the public safety sector". It said that the eLTE Multimedia Critical Communications System (eLTE MCCS) brings together platforms, networks and terminals to achieve comprehensive awareness of situations, multi-service collaboration, and capabilities enabling dispatching anywhere as required.

According to Huawei, the *eLTE MCCS* enables the creation of a unified service and closing of technological gaps by interconnecting narrowband systems, video surveillance and GIS systems through a mobile service convergence platform. It believes the *eLTE MCCS* will enable the gradual phasing-out of existing narrowband networks and upgrading to new networks, while maintaining provision of services and protecting the investments customers have already made in narrowband infrastructure.

The solution encompasses various series of terminals and equipment designed to be used for voice and video by individual users as well as those in vehicles. Huawei said that in consideration of the variety of conditions customers operate under, the *eLTE MCCS* provides differentiated network products that meet different standards such as those by 3GPP, ITU and MulteFire.

The platform is designed to add value to services on three levels.

Firstly, Huawei says its *Dispatching Anywhere* capability provides ubiquitous multimedia dispatching of voice, video and data that allows streamlining of the last kilometre in police cloud operations. It claims this enables smart policing and the agile use of resources such as cloud-delivered video and data.

Secondly, the *Comprehensive Awareness* product series includes equipment used by individual police officers, vehicle-mounted equipment, mobile control cameras, etc., that helps achieve comprehensive awareness of situations, along with a system of safeguards comprising voice, video and data. According to Huawei, synergising mobile video cloud, fixed video cloud and public social networks allows prediction of safety hazards rather than mere prevention, increases deterrence, raises efficiency, and provides trustworthy multimedia evidence for law enforcement.

Thirdly, the *Multi-Service Collaboration* solution is said to make smooth connections among public communications networks and current narrowband trunking systems (such as P25/TETRA/DMR) possible. Huawei said that this safeguards installed base assets and allows convergence of data across different networks. It added that with *eLTE MCCS*, data no longer needs to be exchanged between officers repeatedly – instead, a one-off exchange with the system will suffice. The company claimed this simplifies the police's work and increases collaboration efficiency.

Converge and combine

Expway and Softil have integrated their technologies in a move that is claimed to bring to market the "most advanced" 3GPP standards-compliant end-to-end solution for mission-critical communications voice, data and video.

The new platform is built upon Softil's 3GPP standards-compliant *BEEHD* client framework and is now enhanced with support for eMBMS (evolved Multimedia Broadcast Multicast Services) capabilities via integration of Expway's LTE broadcast middleware. The partners said their mission-critical communications over LTE solution will have widespread applications in first responder networks, providing users with key eMBMS-based device features. These include mobile broadcast, group communication, PTT, push to video, file delivery and emergency alerts when using off-the-shelf and ruggedised smartphones.

With the addition of eMBMS support by Expway, Softil said *BEEHD*'s capabilities such as presence, video calling, video streaming, data sharing, and location services can now be utilised in the most efficient way over mobile data networks. It added that this is "extremely important" in high load scenarios, and that critical communication solution vendors will now be able to launch the next generation of products to help first responders handle emergency tasks "more efficiently".

Airbus showcased a number of new innovations at CCW, including a demonstration of new capabilities for its network monitoring application *Viewcor*. This can now not only check a TETRA system but also monitor the service quality of broadband networks. Airbus said this helps user organisations to control their secure group communications, whether voice or multimedia. It said that with only a glance at the computer screen, operators are able to check network coverage, capacity and the status of base stations at any time.

The eLTE Multimedia Critical Communications System from Huawei encompasses various terminals and equipment designed to be used for voice and video by individuals and on the go in vehicles.

Softil has teamed up with Expway to introduce what's claimed to be the "most advanced" 3GPP standards-compliant end-to-end solution for mission-critical communications voice, data and video.

Operational managers can check two dissimilar networks on the same screen. They can receive information about the broadband network's service quality from user devices. *Viewcor* allows real-time monitoring and visualizes the networks on a map – for both networks together or separately. All data is fed into *Viewcor*'s analytics engine, and service reports or analyses are available after an operation.

Airbus said the application's new capability can be easily installed on top of existing narrowband network infrastructure. It also said that the solution was perfect for those who are thinking about upgrading their secure communications network with broadband services.

Last year saw the launch of Hytera's LTE-PMR *Convergence Solution*. It is said to include "cutting-edge" multi-mode advanced radio terminals, narrowband-broadband infrastructure, and management software.

Hytera said the platform also incorporates feature-rich broadband technologies while ensuring that critically important voice services remain reliably accessible using narrowband technologies such as TETRA, DMR, and PDT.

The company said its system enables emergency voice transmission over a narrowband network, as well as big data and video transmission over commercial or private LTE networks. The IP66 rated hardware integrates the BBU, RRU and core network, and is said to provide diverse terminal schemes as well as integrating video surveillance schemes for outdoor operations. Huawei added that the solution offers flexible deployment and can also be used to extend the coverage of a private network. It features E2E encryption between the PoC server and broadband terminals on the private network, and also supports APIs to meet individually tailored requirements.

The BBU itself supports 1+1 backup for key units, standalone mode to provide a stable service in the event of an eTC malfunction, and flexible switch over to upgrade and expand capacity. Hytera said the unit provides 150Mbps/75Mbps downlink/uplink throughout.

Sticking with tradition

IHS Markit predicted that over the next few years, LTE will complement critical voice with data rather than replace LMR platforms altogether.

Hytera certainly continues to invest in more traditional critical comms technologies, and earlier this year it unveiled a DMR Tier 2 conventional radio designed for commercial users such as taxis, agricultural vehicles, delivery vans, etc. The *MD615* has a UHF range of 400 to 470MHz and a VHF range of 136 to 174MHz. It is said to offer high power and is capable of transmitting at up to 45W (UHF) or 50W (VHF).

The handset itself weighs 1,100g and measures 164 x 43 x 150mm. It features four programmable buttons and supports a channel capacity of 48 channels over three zones. The *MD615* is also equipped with an analogue and digital auto detect feature that recognises what kind of signal is being received and switches to the correct mode for audio output.

Other features include an emergency button on the front panel, a 4·6W internal speaker, audio/programming port, volume and channel controls on the front. Bluetooth capability is also built into the front panel or can be installed in the control head as a factory option, while the rear panel houses a connection port for an external GPS module. The radio is IP54 rated for protection against dust and water intrusion, as well as MIL-STD-810 G certified for shock and vibration.

Furthermore, the *MD615* supports Hytera's pseudo trunk technology which, it's claimed, enables two voice channels to be automatically assigned dynamically to allow several talk groups to communicate in the same frequency. The company says this increases the radio's capacity and enables more than two talk groups at no extra cost or frequency license.

Hytera subsidiary Sepura is also continuing to back more conventional critical comms technologies with the *SC21* which was launched in 2017 and hailed as a next-generation, high-performance, handheld TETRA radio.

According to the company, its customers had been looking for a compact radio that could be worn on a lapel or in a pocket, but had found that a smaller size often meant compromising on performance, usability or audio quality. The result is the *SC21* which is 25 per cent smaller than the *SC20* without compromising on audio quality. Sepura said the device has a "powerful" TETRA engine offering Class 3 RF transmission and "exceptional" receive sensitivity. It claimed the *SC21* allows users to continue communicating in areas where other small radios lose reception. It added that the audio capability is enhanced by unique water-porting technology which allows for superior audio clarity, even in continuous heavy rain.

Left: launched last year, Hytera's LTE-PMR converged solution integrates the BBU, RRU and core network. Right: the MD615 DMR radio is aimed at commercial users.

New applications

As well as hardware, critical comms companies have also been busy supporting the development of specialist apps for their devices and users.

At CCW, Sepura announced its *AppSPACE* applications environment. It said this provides a more flexible approach to providing customer-specific applications, and enables firmware-independent deployment of bespoke applications that deliver added capabilities to its current generation of radios.

According to Sepura, *AppSPACE* allows rapid deployment of custom-designed solutions which meet specific end user requirements. It said this can be demonstrated in the delivery of application-based tools which automate manual processes and common critical tasks, ensuring that defined situation-based operations are enforced on the radio. Examples include radio location and geo-fencing, user health monitoring or automatic switching to emergency talk groups.

Sepura said a key feature of *AppSPACE* is its ability to support multiple applications running concurrently – whether as a background task or those which directly engage with fleet radio users. It said that alerts and notifications ensure that both user and control room maintain continual awareness of critical information.

Applications are deployed using the company's *Radio Manager* fleet management tool. Sepura said this ensures that the process is simple, and completed in a cost- and time-effective manner.

Motorola Solutions' new *Capture Mobile Camera App* has been designed to enable first responders to easily capture image, video and audio evidence using the *LEX L11* (*see p21*), or *Android* and *iOS*-based smartphones.

The company said that all content is securely uploaded to its *CommandCentral Vault* digital evidence management solution for storage and later use. Metadata like time, date and location is automatically applied to the captured file. Tags can also be added to the file after capture using the app, or later from within the *CommandCentral Vault*.

Motorola said that from the moment of capture, all evidentiary data is isolated from personal data, making it inaccessible for tampering by other apps. The chain of custody is established at the moment of capture, so devices do not need to be subpoenaed.

Airbus has been working with a number of different development partners to expand the range of applications that are now available for its *Tactilon Dabat* integrated TETRA radio and *Android* smartphone.

For instance, the digitalised *Triage* application from Exomi helps paramedics and other first responders in the field to send complex patient health data to the hospital. Airbus said the information can be easily shared not only via the Tactilon Dabat, but also on other platforms in control rooms or in the field.

PHOTO: © AIRBUS

With more broadband devices now available for critical comms users, apps are becoming crucial. Sepura hopes to make their development easier with its AppSPACE framework (left), while Airbus has partnered with various developers to build apps for its Tactilon Dabat TETRA radio/smartphone.

Another example highlighted is *ES-Core* from Eye Solutions. This features a live video sharing function that is said to be secure and supports external video sources, such as from drones or vehicles. Airbus said that even with sparse radio coverage, transmission is of high quality. Moreover, footage can be stored as evidence or for the purpose of analysis.

Meanwhile *Steerpath* is an indoor positioning system that can be used to fill radio coverage gaps in public buildings. The app is said to create real-time situational awareness when communication groups move around, both indoors and outdoors. Based on a map configuration with a GPS function, Airbus said commanders and group members (TETRA and smartphone users) can easily follow each other on the *Dabat*'s display. It adds that no configuration is needed, and that the app works without a broadband connection.

Airbus also presented a glimpse into the future at *CWC* with a demonstration of a new pilot version of its real-time virtual reality technology.

For the demonstration, the company simulated a scenario with a firefighter wearing a 360° camera in a metro station. This enabled an officer at a remote command centre to virtually step into the situation.

Airbus said its VR system is based on 'Secure Mobile Virtual Network Operator' (SMVNO) infrastructure. The basic idea behind this is to provide secure and reliable broadband capacities, from network operators, to public safety agencies. In addition, SMVNO and VR features can be combined with other narrow- and broadband components from the firm's Tactilon product portfolio.

According to Airbus, firefighters and police officers will be able to use the solution to "effortlessly" carry out complex tasks from remote places through a secure communications infrastructure. In the future, it said VR will help firefighters or police officers to enhance their missions and enlarge their range of actions. ■

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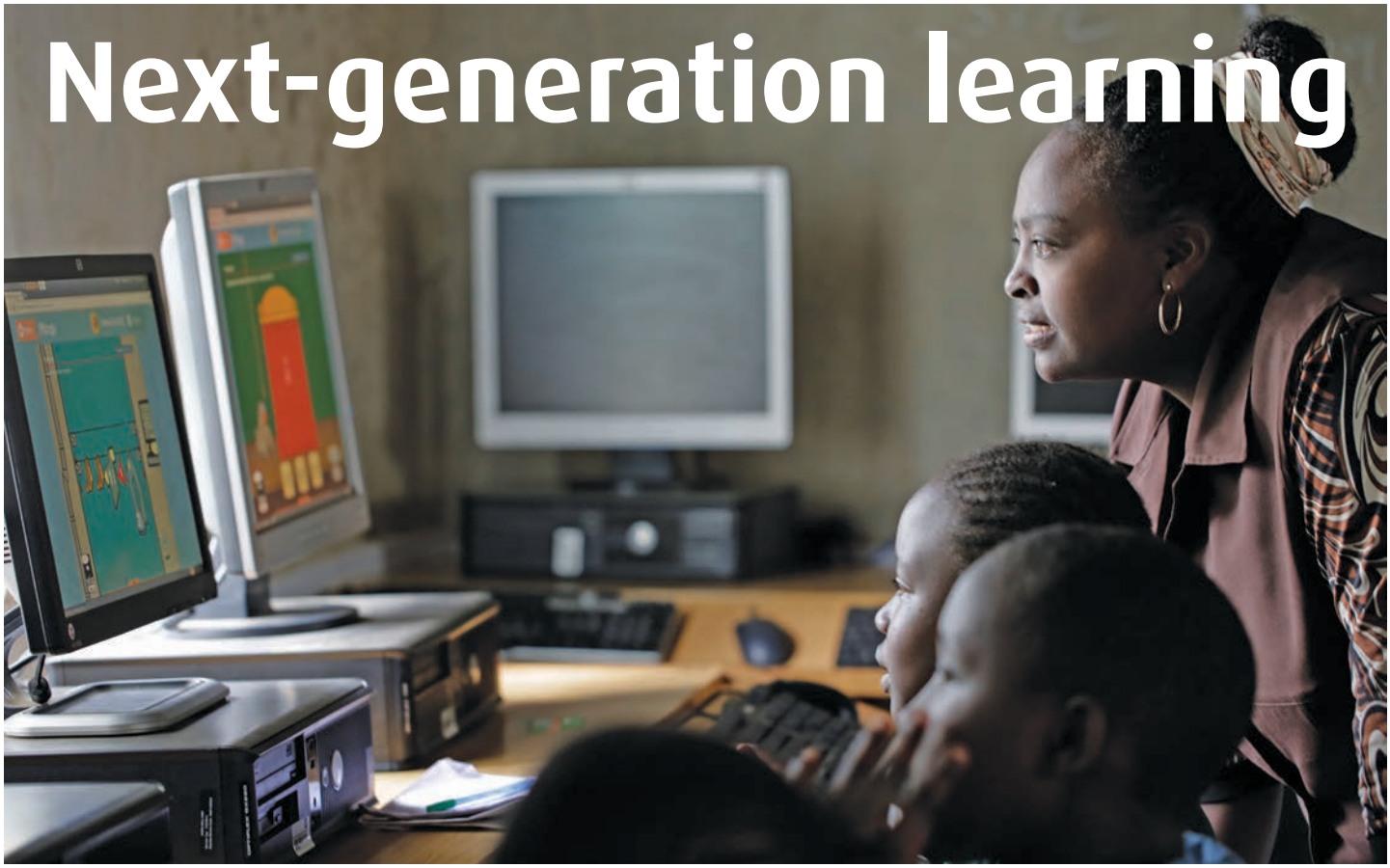

Using Avanti's HYLAS 2 satellite, the iMlango project connects 205 primary schools and more than 155,000 children across Kenya. PHOTO: AVANTI

How mobile operators are working in partnership with education administrators and experts to give students vital skills.

More than a million children in Kenya do not regularly attend school because of societal issues such as poverty and distance. The *iMlango* project was set up to deliver connected education to such children. It is now operating in 205 primary schools in four counties, benefitting 78,864 girls and 79,830 boys. The counties – Kajiado, Kilifi, Makueni and Uasin Gishu – were identified according to several marginalisation criteria: poverty rates, attendance levels, and girls' educational opportunities. The majority of the schools are located in rural or semi-urban settings.

Led by Avanti Communications and its partners (the UK Department for International Development, sQuid, Whizz Education and Camara Education) *iMlango* has been designed as a comprehensive educational technology programme with the aim of improving learning outcomes, enrolment and retention. It does this through a number of factors which include the delivery of high-speed satellite broadband connectivity to schools.

While reliable access to broadband is crucial when delivering e-learning programmes, many schools in Kenya are located beyond the reach of terrestrial networks. *iMlango* uses Avanti's *HYLAS 2* satellite to give each school access to resilient, high-speed broadband connectivity to support its interactive e-learning platform.

The latter is provided by sQuid. It delivers Kenya Institute of Curriculum Development-approved and other specialist learning content in multiple formats to students and teachers. Pupils can access *Maths Whizz*, a personalised virtual maths tutor that tailors each child's learning experiences depending on her or his ability, as well as other content such as Africa-focused stories, the world's first children's encyclopaedia, and curriculum-aligned revision guides. All pupil activity, such as time spent on specific content and their progress is captured, with detailed data reports provided to teachers, schools and programme stakeholders.

sQuid has also provided a system to enable the schools to measure pupil attendance. The smartcard-based platform creates reports using advanced analytics which are used by teachers and the field team to identify low-attending pupils.

ICT equipment to improve digital literacy and provide access to the interactive learning platform has been supplied and installed by Camara Education. The hardware provides the first digital experience for pupils and teachers, and Camara also leads on the delivery of training to ensure teachers can use the technology effectively in the classroom.

iMlango provides specially designed *Android*-based mobile tablets to conduct in-class attendance monitoring. The device, which operates without the need for an always on internet connection in rural settings, operates several native-built apps that support new student registration, in-class attendance, and payments. The latter is said to be an intuitive app for users with low-literacy levels to accept payments at rural merchants located in the communities that surround the *iMlango* schools.

According to Avanti, as well as benefitting children in Kenya, the project also raises awareness for government or private sector spending in connecting African schools to the internet. It also reckons that the programme has clear and wider applications across the education sector in sub-Saharan Africa.

'Super WiFi' connects university campus

Established in 1990, the Ibn Zohr University (Université Ibnou Zohr or UIZ) is a public higher education institution in Agadir, Morocco. It wanted to deploy a Wi-Fi network throughout its Faculty of Science to enable various mobile applications

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within the campus, and encourage interactive learning among students and professors.

Based in Hong Kong, Altai Technologies specialises in carrier-grade Wi-Fi products and technologies. The university approached the company's partner in Morocco to conduct a site survey and recommend a wireless solution that would provide both students and staff with fast and reliable connectivity across its campuses.

Several challenges were identified. UIZ was a large campus characterised by a very dynamic environment, high user capacity, and the need for robust network security. The WLAN needed to cover both indoor as well as outdoor areas, and the solution also had to be rapidly deployable as well as scalable. After several trials, Altai's proven *Super WiFi* solution was quickly identified as the best-fit solution.

Utilising patented smart antenna technology as well as the *AltaiCare* cloud-based management system, *Super WiFi* is designed from the ground up to deliver Wi-Fi networks that are claimed to offer "unprecedented" performance, reliability, scalability, and manageability. The system includes a complete portfolio of indoor and outdoor products for carriers, WISPs, and enterprises to support a wide range of applications such as mobile data offload, public access, WLAN access, and backhaul.

With various antenna downtilt on different sectors, Altai's *A8n* 802.11 a/b/g/n/ac base stations are installed on light poles to provide large area outdoor Wi-Fi coverage. With 8×8 MIMO and patented smart antenna technology, the company said the unit is designed for the broadest coverage range and best NLOS performance. Operating concurrently in both 2.4GHz and 5GHz bands, it adds that the base station can provide access connectivity in both bands as well as long-range (up to 30km) backhauling in the 5GHz band.

Meanwhile, Altai's *C1n* base stations are used as CPEs to extend the Wi-Fi signal from outdoor to indoor areas. According to the vendor, these use a patented smart-signal processing algorithm and an antenna designed to increase Wi-Fi signal strength (transmission and reception) as well as the client's throughput. The unit can also operate as a standalone AP to provide LOS coverage of up to 250m.

The company's IP67 rated *A2*s have also been installed to provide micro coverage in some corner areas. This dual-band 2×2 802.11ac outdoor radio can be used either as an AP with built-in backhaul for high density user environments, or as a point-to-point/multipoint bridge that is said to deliver "wire-like throughput at the market's most affordable price point" All APs are connected with the *Altai Wireless Management System* for network management and monitoring.

Left: Altai's partner in Morocco carried out a site survey of the university and discovered several challenges. Right: the infrastructure includes APs installed on light poles to provide wide area Wi-Fi coverage as well as radios to extend signals to indoor areas.

According to the company, its solution has significantly improved UIZ's Wi-Fi signal coverage by 10 times per AP and five times the capacity to provide 100 per cent indoor and outdoor coverage. It adds that the system can also scale to accommodate the university's future growth, and a network expansion plan was expected to begin during the first half of 2018 to cope with an increasing number of users.

Mindset uses satellite to transform education delivery

South Africa-based Mindset Network NPC develops and delivers educational resources across Africa. Through its three principal programmes – *Mindset Learn*, *Mindset Teach* and *Mindset Health* – the independent non-profit organisation produces curriculum-focused video content distributed via television, the internet and multimedia.

Since its inception in 2002, it is said to have developed more than 1,500 hours of video content for teachers, students, healthcare workers, patients, young adults and the general public.

With users spread across a vast area of the continent, Mindset realised early on that satellite technology would allow it to rapidly and efficiently reach facilities across its targeted regions. As a founding partner, Intelsat was uniquely positioned to assist Mindset in fulfilling its mission to deliver education programmes throughout South Africa and beyond.

Using capacity on *Intelsat 17*, Mindset broadcasts its channels via satellite to clinics and schools across the continent. Content ranges from health-related topics such as HIV/AIDS, Ebola and child survival, to various science subjects, maths, IT, amongst many others.

For example from 2012 to 2015, Mindset worked with USAID, the ELMA Foundation and the J.P. Morgan Chase Foundation on the *Ukusiza Project*. As well as aiming to help almost two million primary grade children to improve their reading abilities over the period, the project was also developed to give teachers the vital skills needed to deliver quality education in order to maximise student achievement.

To boost teacher competencies, Mindset produced and distributed more than 34 hours of video training and support materials in language and reading. Content ranged from lesson planning to classroom management and samples of master teaching. Using capacity on *Intelsat 17* as the primary distribution method, resources were disseminated to 73 Teacher Centres across the country, reaching more than 2,100 teachers and 679 district officials. A rollout to more schools in all nine provinces in South Africa was expected over the project period.

In independent evaluation tests, schools equipped with the Intelsat-connected learning platform showed consistent improvement in student performance.

As part of an independent research study to evaluate *Ukusiza*'s impact, eight test schools and eight control schools within 5km from four provinces were selected. Test schools were given a satellite dish, television and a server to host video and print resources. These resources were updated via satellite. The control schools were not given any resources during the evaluation period.

Data collected before the study formed the baseline assessment, with pupils at both test and control schools performing at similar levels in their Early Grade reading assessments. During the evaluation period, the control school results remained similar, with only minor fluctuations in scores. But test schools showed consistent improvement in student performance in every category. Most notable was a 22.2 per cent improvement in reading comprehension and 128 per cent improvement in letter naming frequency, increasing from 39.2 to 89.2 letters per minute.

Mobile operators boost access to digital content

Africa's biggest mobile operators, such as Orange, Vodafone and MTN, are each on a mission to provide free access to digital educational content on the continent. Orange believes digital education is a stepping stone to autonomy, financial security and professional opportunity, and has therefore made it a priority with a number of different initiatives in its country of operations.

First launched in 2014 by the Orange Foundation, the *Digital Schools* programme involves giving African schools a kit that comprises a *Raspberry Pi* mini server of educational content connected to 50 tablets. The programmes are delivered in partnership with each country's education ministry which identifies the most appropriate school textbooks which Orange then uploads into the kit.

By the end of 2014, Orange had helped 100 schools as part of the programme, benefitting 20,000 pupils in five countries. In 2017, this number grew to 130,000 pupils, with schools now in Madagascar, Niger, Tunisia as well as Cameroon, where 30 schools were launched last year.

For example, Binguila is a village located 25km from Yaoundé. Prior to Orange's help, its state school lacked equipment and books. But 210 pupils now have free access to the educational

and extra-curricular educational content stored on the Raspberry *Pi* mini-server, without the need for an internet connection. They can access resources such as Wikipedia, the last ten seasons of the *Primary Studies Certificate*, as well as maths and science lessons.

Orange planned to provide its kit to 45 primary schools across Cameroon, including those in more remote regions such as the village of Bonepoupa which is in the municipality of Dibamba in the western part of the country.

The operator had already worked in Bonepoupa as part of its *Village Orange* programme in early 2014. It equipped three vital structures for the community, including a water supply, health centre and school which has now been transformed into a Digital School, enabling 321 children to discover encyclopaedias, dictionaries, literature, maths lessons and science in the form of video, revision sheets and card games. The company has also finished electrifying the village with the Energy Assistance association.

Citing research by UNESCO, Vodafone said 59 million children aged 6 to 11 were out of school in 2013, with 30 million of those children living in sub-Saharan Africa. Under its *Instant Schools for Africa* initiative, the company is aiming to provide millions of young people with online learning materials developed in conjunction with Learning Equality, a not-for-profit provider of open-source educational technology solutions. The two partners are also working with education ministries and local experts in each country.

Vodafone has setup *Instant Schools for Africa* as a long-term cumulative programme, and said that its reach, scale and relevance will be increased over time by encouraging other major mobile operators in the countries involved to adopt a similar, non-commercial approach. It believes that impact will be maximised by providing other cellcos with the technical specifications required to extend the philanthropic programme to the largest possible number of beneficiaries.

Current participating markets include South Africa, the DRC, Ghana, Kenya, Lesotho, Mozambique and Tanzania. Students and teachers who are customers of Vodafone or its African subsidiaries will not incur any mobile data charges when accessing educational online content under the initiative – all that is needed is a data connection to the operator's network. To increase accessibility, all the content is said to be optimised for simple, low-cost mobile devices with basic data connectivity (3G) and areas of low coverage or capacity. Vodafone adds that all content is tailored, drawing on a combination of the best openly licensed global and local educational resources to provide country-specific material.

MTN pointed out that access to digital content comes into its own in many of the emerging markets in which its operates, especially given the fact that the distribution and costs of printed materials is an obstacle to ensuring that all communities, regardless of geographic location, have access to information.

Under its Digital Schools programme, the Orange Foundation provides a kit that comprises a mini server of educational content connected that is accessed by children using tablets that are also donated by the company.

In 2012, MTN facilitated the introduction of Microsoft's *Pathfinder* e-learning platform across Uganda, adding further content and donating data connectivity to allow 50 participating schools access. Initiated as part of the cellco's annual Y'ello Care CSR initiative, MTN Uganda partnered with Gayaza High School which is the country's oldest all-girls boarding secondary school and is located around 19km northeast of Kampala. The aim was to drive awareness of and use of *Pathfinder* as a means of creating access to quality and up-to-date education material for both teachers and students in secondary schools nationwide, particularly those in rural areas.

The platform offers a variety of subjects ranging from science to the arts, with content available in printed as well as video formats which is especially useful for practical lessons. It also features a tool to enable students to evaluate themselves on examination preparedness, complete school holiday assignments, and carry out lesson-based assessments.

Teachers can also use the platform to learn, grow and share knowledge through interaction with their counterparts in different schools across the country. With the ability to upload their own developed content onto the site, teachers have a forum to discuss and debate curriculum structures and details.

MTN said it had supported 26 schools by the end of 2012, and another 24 in early 2013. Based on the platform statistics, it said that the number of visits to the platform were averaging 2,000 a month, up from 500 at the start of the programme.

The operator later went on to enhance the platform. It redesigned the site to create what it said was "youth appeal", partnered with educational content providers to increase on-site content, and also introduced awareness campaigns, including public school competitions.

"Train-the-trainer"

Central de Medicamentos e Artigos Médicos (CMAM) is the central medical stores for Mozambique. Since 2009, it has worked with UK-based MACS Software to equip its sites with the latest warehouse management technology to help maintain efficient supplies of lifesaving drugs.

The first warehouse went live with *MACSwms* in Zimpeto in 2009, and there are now four other facilities operating in the country with the company's technology: Beira One; Matola; Beira Two; and Nampula and Munhava.

MACS recently delivered a training programme to support CMAM's smooth transition from a paper-based to an RF-based warehouse operation.

RF helps eliminate picking errors caused by human error. Items are scanned and confirmed, automatically updating the back-office in real time. This is said to ensure that the correct items are picked every time and reduces the delay between an item being selected and the system being updated. According to MACS, the system increases accuracy, efficiency and picking rates, while allowing greater movement of stock through the facility.

Jim Chew, implementation analyst at MACS Software, said: "As [CMAM] moves to RF picking technology, it's vitally important that they get it right from the start and have the ability to train people effectively as new members of staff are recruited."

Chew recently led a training programme at MACS' UK headquarters for five senior members of staff from Mozambique. The training was split into modules relevant to each level of skill and authorisation. This started at level one for an operator and moved on through supervisor, technician, senior technician, administrator and senior administrator.

MACS technical team leader Alban Fellows assisted Chew and also ran a 'train-the-trainer' programme. "Our aim was to make the staff in Mozambique as autonomous as possible," said Fellows. "They now have the skills to train new recruits when they join and to keep the skill level of existing employees at the highest level."

With the training complete, staff at the Zimpeto operation are able to train others in-house and to handle many of the administrative functions, such as the allocation of RF scanners and fault finding. "We wanted to empower the team in Mozambique to handle the day-to-day operations" said Chew. "It makes them much more self-reliant and, therefore, more confident."

According to MACS, more than 1.2 million people in Mozambique have HIV, and many of the critical items needed by health centres do not reach them because of extremely challenging distribution infrastructure. The company believes that its latest collaboration with CMAM will provide a level of efficiency and control that has never been possible in the past, helping the country's people to live longer and healthier lives. ■

Technicians from CMAM learn how to use a new warehouse management system to transition from a paper-based to an RF-based operation.

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The Internet of Everything promises to give humans unlimited access to knowledge – but only if service providers can harness the power behind the technology.

Connecting with the digital brain

How can communication service providers use artificial intelligence? MEL PRESCOTT, from analytic software firm FICO, discusses three areas where the technology could help.

According to Klaus Schwab, founder and executive chairman of the World Economic Forum, the advent of the fourth industrial revolution means that "the possibilities of billions of people connected by mobile devices with unprecedented processing power, storage capacity and access to knowledge are unlimited"[1]

This puts artificial intelligence (AI) and machine learning (ML) firmly into the spotlight within most communications service provider (CSP) boardrooms, as executives look to the technology to help improve customer experience and reduce operating expenses.[2]

So, where are the smart bets being placed for AI and ML to create business value?

Customer experience

Given that CSPs are generally not hugely popular with their customers compared to other industries when measured by the Net Promoter Score,[3] and that a number of digital companies have created a 'new normal' for customer experiences, it is no surprise that many CSPs are examining how AI and ML can be deployed to improve customer interactions in areas such as marketing and sales, retention and subscriber support.

There is no doubt that ML can help CSPs take a wide range of inputs from the complex and continuous flow of data available from both network events and customer interactions. This data can be streamed from multiple sources, capturing dynamic events from all customer channels, CRM information and the network itself in order to learn and find hidden combinations.

These insights can be used to drive the appropriate contextual action, including decisions that impact

[1] https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/
[2] TM Forum Trend Analysis Report, AI: The time is now, December 2017
[3] https://inform.tmforum.org/customer-centricity/2017/10/using-nps-measure-digital-success/#prettyPhoto

Streaming processes data as it is being generated, enabling CSPs to identify risky behaviour as it occurs rather than after the event.

measures such as churn propensity and customer lifetime value.

For example, using AI & ML will enable CSPs to generate sophisticated, segmented, personalised offers in real time. These intelligent offers can fall into many categories, such as usage stimulation, loyalty programmes, device upgrades, household engagement and customer education.

Similarly, customers expect to interact with a CSP across a variety of channels, whether its directly through agent conversation, digital self-service or user communities. This is currently the most mature use case for AI, where virtual agents, chat bots and voice assistants are deployed to help automate the answer to customer queries, or even support human agents by helping them with cross-sell and upsell or making it easier to locate the required answer.

Network operations

Network operations automation is another area where AI and ML will undoubtedly be used, and it will have high impact to CSPs.

The burgeoning internet of everything (IoE) introduces unprecedented scale and velocity into how the network processes events at a level that becomes unfeasible to manage with manual processes. As SDN (software defined networks) and NFV (network functions virtualisation) become the norm, the complexity of these networks will require ML to learn how best to automate and manage the orchestration of network resources and capacity, amongst other functions, to ensure uninterrupted service availability.[4]

Operators such as Telefónica have already transitioned from a network operations centre to a service operations centre. The goal? To "maximise capacity and solve any problems before end users even notice anything". The company adds that the aim is also to use data from the network to move from a scheduled maintenance model to one that enables predictive and proactive maintenance.[5]

Meanwhile, AT&T continues the adoption of its so-called 'Domain 2.0' initiative to also transition from hardware-centric to software-centric as it realises that the dynamic approach delivered by SDN and NFV results in greater flexibility at a lower cost. Automating network functions provides a range of benefits to the business and facilitates an improved ability to give customers what they want. In an online article published in 2016, AT&T reportedly said that Domain 2.0 was like moving from devices to apps, adding that it had recently brought back unlimited data and that one of the reasons it was comfortable doing that was because it knew a software centric network could adapt to meet the demand.

Having the ability to analyse network data over time allows AI and ML to predict likely failures and the confidence level that failure will occur, thereby allowing for corrective action to be determined and executed. The end goal here is to combine advanced analytics with AI and allow networks to self-heal and operate autonomously.

What's in the black box? Artificial intelligence comes with many challenges including trying to decipher what models that use the technology have learned and thus their decision criteria.

Fraud and security

Security must be a key consideration in the advancement of AI and ML, particularly as IoE growth accelerates.

By applying streaming user and entity behaviour analytics (UEBA) that generate cyber security scores in real time, security teams can easily prioritise alerts associated with anomalous behaviours and actively respond to truly suspicious network activity. The ability to dynamically learn and adapt in real time means that fewer false positives are generated compared to more traditional, rule-based approaches.

Importantly, streaming data processes information as it is being generated rather than having latency or relying on large stores of historical log files – it allows CSPs to identify risky behaviour as it occurs rather than after the event. This is crucial for ensuring the protection of customer data and maintaining consumer trust.

As well as protecting themselves and their customers from cyber threats, CSPs are also beginning to use AI and ML to monitor CDRs (call data records) in order to learn what behaviour deviates from the norm in order to respond accordingly.

Additionally, there are substantial benefits to using AI and ML to identify fraud behaviour and take corrective action. For example, international revenue share fraud is characterised by large volumes of calls to a single destination in an attempt to artificially inflate traffic that terminates to international revenue share providers. This can be identified by examining CDRs, and instead of relying on retrospectively reviewing the records once the damage has been done, AI and ML can help prevent such fraud in real time.

Explainable AI

Artificial intelligence comes with many challenges, including trying to decipher what the models have learned, and thus their decision criteria. One of the major areas of exploration is 'explainable AI' (XAI), which attempts to crack open this 'black box' and explain how and why a model derives its decisions.[7]

XAI is required in regulated environments and also to build trust amongst customers and business leaders. This is especially true if CSPs are to really allow machines to make autonomous decisions around mission critical infrastructure such as network operations or security.

At the *FICO World 2018* event in April, Garry Kasparov – the chess grandmaster who was famously beaten by IBM's *Deep Blue* computer and then went on to become an expert on human-machine collaboration – reinforced the importance of understanding how and why algorithms are making their decisions.

FICO has been pioneering XAI for more than 25 years. In our experience, we've seen various ways to explain AI when used in a risk or regulatory context and to crack open the black box. These include:

- Scoring algorithms that inject noise and score additional data points around an actual data record being computed. The aim here is to observe what features are driving the score in that part of decision phase space.
- Models that are built to express interpretability on top of inputs of the AI model.
- Models that change the entire form of the AI to make the latent (hidden) features exposable. With this approach, we are going to rethink how to design an AI model from the ground up, with the view that we will need to explain latent features that drive outcomes.

As communication service providers become more familiar with artificial intelligence and machine learning, and the benefits these technologies can bring to streamlining operations, they will be able to free up staff to focus on more value-added tasks. Together, people and advanced analytics can improve service, reduce churn, and keep businesses and consumers protected from criminal activity. ■

[4] Ovum TMT Intelligence, How can AI support CSPs transformation programs? December 2016
[5] Telefonica Integrated Report, 2016
[6] https://www.rcrwireless.com/20160712/fundamentals/domain-2-0-tag31-tag99
[7] http://www.fico.com/en/blogs/analytics-optimization/explainable-ai-breaks-out-of-the-black-box/

BS-1 launch makes history double

SpaceX has successfully launched Bangladesh's first communications satellite. The mission represents a milestone not only for the Asian country but also for SpaceX's innovative use of reusable launch rocket stages.

Built by Thales Alenia Space (TAS) for the state-owned Bangladesh Communication Satellite Company Limited, *Bangabandhu Satellite-1* (*BS-1*) was launched on board a Falcon 9 from the Kennedy Space Centre, Florida, on 11 May.

The full chemical propulsion satellite uses TAS' upgraded *Spacebus 4000B2* platform and is expected to have a mission life of at least 15 years.

BS-1's payload includes 14 C-band and 26 Ku-band transponders to support DTH, video distribution, VSAT, broadband and trunking services. It will also support e-learning, telemedicine and remote office applications, as well as providing uninterrupted telecoms in the event of national or regional natural disasters.

From its orbital location of 119.1°E, the satellite will offer Ku-band capacity over Bangladesh and its territorial waters across the Bay of Bengal, as well as covering India, Nepal, Bhutan, Sri Lanka, Philippines and Indonesia. It will also offer C-band for the whole region.

BS-1 was the first satellite to be launched using SpaceX's *Block 5*, the final substantial upgrade to its *Falcon 9* launch vehicle. Over the last few years, the company has been striving to develop rockets that offer rapid reusability and extremely high reliability. It says *Falcon 9 Block 5* is designed to be capable of 10 or more flights with "very limited" refurbishment.

Following separation during *BS-1*'s launch, the rocket's first stage successfully landed on SpaceX's droneship – which is humourously named 'Of Course I Still Love You' – stationed in the Atlantic Ocean.

Colt and PCCW Global expand blockchain trial

UK-based global network connectivity provider Colt Technology Services and PCCW Global, the international operating division of Hong Kong's HKT, have further progressed their blockchain proof of concept.

In March, the two companies worked with blockchain startup Clear on a trial that demonstrated how the inter-carrier settlement of wholesale international services could be automated through the use of blockchain. By using the technology, it's claimed they were able to reduce this labour intensive process from hours to minutes.

This trial used historical data as a test of the technology and its use case for the sector. The partners say they have now taken this step further by ingesting actual live data feeds into the ledger, enabling traffic to be automatically verified and settled between carriers.

Colt CEO Carl Grivner says: "Not only did the second iteration of the PoC do what was intended – accurately match and settle wholesale traffic independently with live information – but it also signals the future of telecoms, whereby previously intensive manual practices can be securely automated."

While Colt and PCCW Global are now using live data to verify and settle traffic, other members of the ITW Global Leaders' Forum (GLF) are also getting involved in the initiative. They include BT, HGC Global Communications, Telefónica and Telstra.

The two original partners say the ultimate aim is to expand their testing to encompass a multilateral series of relationships across the wholesale telecoms industry. Marc Halbfinger, PCCW Global CEO and GLF chairman, says: "Industry cooperation in this area will be incredibly powerful for the whole sector."

Vodafone and Huawei test IP microwave backhaul for 5G

Vodafone and Huawei say they have completed lab tests indicating that traditional IP microwave links can be considered as viable technology for 5G backhaul.

The companies say because 5G networks will present new backhaul capacity, peak data rate and latency requirements, the ability of IP microwave in traditional bands to support the new technology is a positive development.

The trial tested both the capacity and latency that could be achieved using a traditional IP microwave link. Vodafone and Huawei say the tests showed that it is possible to deliver up to 2.7Gbps capacity from a single IP microwave link, aggregating 2 x 112MHz channels in a single vertical or horizontal polarisation. The companies claim this is the first time that a single RF outdoor unit has been capable of reaching more than 2Gbps in a single polarisation.

They further claim that enhancements made by Huawei engineers to the modem and RF unit enabled the team to achieve latency of as little as 50ms.

The partners now plan to test whether it is possible to achieve 4Gbps total capacity in one box with the support of dual polarisation. They say a single RF outdoor unit with dual polarisation can respond to both horizontal and vertical radio waves simultaneously. This increases the system's traffic handling capacity, dramatically reducing power consumption and halving the amount of space needed to house units providing that capacity.

The techniques mean traditional microwave should be able to support high-capacity microwave links already commercially deployed, such as E-band and Multi-Band (a combination of IP microwave and E-band technologies), in providing 5G backhaul.

Eutelsat to launch Very High Throughput Satellite

Eutelsat Communications has commissioned a Very High Throughput Satellite system to support the development of its European fixed broadband and in-flight connectivity businesses.

KONNECT VHTS is due to enter into service in 2021 and will be built by Thales Alenia Space using its all-electric *Spacebus NEO* platform. The 6.3 ton satellite will deliver Ka-band capacity of 500Gbps, and it's claimed that it will also feature the most powerful on-board digital processor ever put in orbit, offering capacity allocation flexibility, optimal spectrum use, and progressive ground network deployment.

It's claimed that KONNECT VHTS' all-digital payload will be the "most powerful" so far put into orbit.

Eutelsat has already agreed two key distribution contracts for the project. A retail partnership was signed with Orange Group to address the fixed broadband market in European countries where it has a retail presence, while a deal with Thales will serve the connectivity services market, notably for the government sector.

Eutelsat CEO Rodolphe Belmer believes that the partnership agreements confirm the place of satellite-based solutions in the drive for enhanced high-speed internet coverage. "As a core complement to terrestrial broadband networks, high-speed broadband will be a critical driver of Eutelsat's growth from 2020 onwards. Over the next decade, VHTS satellites will bring enough capacity to serve high-speed internet and in-flight connectivity markets at scale, offering fibre-like services both in terms of price and speed."

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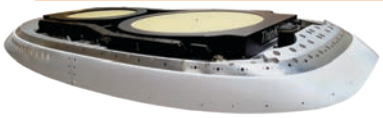


ThinKom says its low-profile ThinAir Falcon-Ka2517 antenna eliminates aerodynamic drag.

ThinKom delivers new Ka-band systems for E-4B aircraft

The US government will use ThinKom's next-generation Ka-band aeronautical satellite antenna systems for its *E-4B* National Airborne Operations Centre.

With the project name *Nightwatch*, the aircraft is a specially modified Boeing *747-200B* and is operated by the US Air Force. It is said to be a key component of the National Command Systems for the president, defence secretary, and the joint chiefs of staff, providing secure and "highly-survivable" global communications round the clock.

ThinKom's *ThinAir Falcon-Ka2517* fuselage-mounted phased-array antenna systems will be installed under a modernisation programme to replace the *E-4B*'s legacy and less-efficient Ku-band ESA (electronically steered antenna) systems.

It's claimed the new system will enable more reliable and more cost-efficient higher-bandwidth voice, data and video connectivity as part of a low-profile subsystem that can exploit both military and commercial satellite assets. Installations are currently under way and the upgrades are expected to become operational by 3Q18.

ThinKom says its platform supports data rates up to 400Mbps on the forward link and 100Mbps for the return. It claims the phased-array antenna apertures are packaged in the industry's lowest-profile radome, eliminating aerodynamic drag in flight.

The company further claims that the unit's "superior" high skew angle performance ensures "highly efficient" connectivity in equatorial regions, while also being able to reliably close links along high-latitude/polar routes at elevation angles below 10°.

Jersey police cut down on paperwork with Motorola

States of Jersey Police will deploy Motorola Solutions' Pronto mobile solution as part of its new digital policing initiative, *SMARTpolice*.

Under a three-year contract, Motorola claims *Pronto* will allow officers on the island to "greatly improve" efficiency by replacing paperwork activities – such as witness statements, stop and search, and fixed penalty notices – with automated and "intuitive" digital forms on mobile devices. The system also provides mobile access to local and national databases for person and vehicle registration checks.

It's claimed Jersey's *SMARTpolice* project will enable officers to more effectively address crime, and more efficiently serve and protect the local community while reducing overall costs and budget.

This is the first deployment of *Pronto* outside mainland UK where Motorola says its mobile suite of policing apps is already used by 20 forces. Within these forces, the company says *Pronto* holds a "proven track record of generating more meaningful police engagement, simple and higher quality processes, improved collaboration as well as substantial cost reductions."

Frontline officers in one UK police force are using Pronto's biometric application and can connect fingerprint scanners to their mobile devices in order to access the national database.

hiSky to offer affordable voice, data and IoT

hiSky will use its recently developed *Smartellite* satellite terminals and Spacecom's *AMOS-17* to provide what it says are affordable, low-capacity voice, data and IoT services in the Middle East.

The company says its small, lightweight and portable terminals feature a built-in electronic pointing antenna that automatically locates the satellite in milliseconds. It says the system includes a compact portable satellite IoT device based on electronically steered antenna technology to provide low data rate services for various applications such as connected vehicles, trains, the energy and agricultural sectors in remote areas, etc. hiSky adds that the secure integrated modem also includes "easy to use" management tools.

The company will use *AMOS-17*'s Ka-band beams following its expected launch to 17°E in 2019.

"Our *Smartellite* family, together with *AMOS-17*, will provide significantly lower prices than the market currently offers," says Yaron Shachar, chief business officer, hiSky.

He also claims that the partnership will result in a "very appealing alternative" in the voice and data mobile satellite services market, and especially for the IoT.

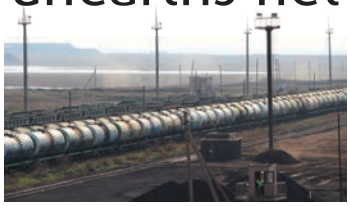
According to Jacob Keret, SVP of sales at Spacecom, *AMOS-17*'s full digital HTS technologies will provide a wide array of service capabilities, enabling the company to combine its "classic" satellite bandwidth product offering with end-to-end communication services throughout the EMEA region. He adds: "hiSky's innovative offering is an exciting solution for applications in remote locations, for satellite on the move communications, and brings us into IoT markets."

Coal producer unearths network treasure

Shubarkol Komir JSC, said to be Kazakhstan's largest coal producer, has upgraded its IT infrastructure and mission-critical video-surveillance platform with the help of InfiNet Wireless.

The vendor's radios are now providing connectivity between 35 remote facilities that cover an area of more than 75km^2 within the territory of the Centralny and Zapadny open-pit coal mines.

InfiNet says its "record-breaking" *InfiLINK 2x2* point-to-point solution is providing data transfer rates of up to 70Mbps as well as rates of up to 35Mbps for point-to-multipoint subscriber units from the *InfiMAN 2x2* portfolio. It adds that the system offers "significant room" to deliver even higher capacities well into the future using the same platform.



The radios connect 35 remote mining facilities that cover an area of more than 75km^2.

Shubarkol Komir uses its network for VoIP, internet and intranet access, as well as for CCTV monitoring of its industrial facilities, including remote sites. InfiNet says all of its wireless units are guaranteed to remain fully operational even during extreme temperature ranges between -55°C and +60°C.

Furthermore, it says that the added challenge of high levels of humidity and the presence of solid dust particles that are commonly found in the air at open-pit coal mines has been eliminated thanks to its "robust" units and the use of a IP66-rated cameras for the CCTV system.

The project was implemented in conjunction with InfiNet's regional partner, Informsvyaz Kazakhstan, which is now a member of The Eurasian Group.

mmWave system trial

Facebook and Qualcomm are working together to improve the speed, efficiency and quality of internet connectivity around the world at what's claimed to be a fraction of the cost of fibre deployments. Qualcomm will integrate its pre-802.11ay chipsets with Facebook's Terragraph technology. Their aim is to help enable manufacturers to build mmWave solutions using unlicensed 60GHz spectrum and provide FWA broadband in urban areas. The companies expect to begin trials of their integrated solution mid-2019.

Joint C-band proposal

Intelsat and SES have agreed on a proposal for C-band frequencies (3700MHz to 4200MHz) to be shared between satellite and terrestrial mobile operators in the US. The proposal includes a framework to enable wireless operators to quickly access around 100MHz of nationwide C-band downlink spectrum to help accelerate 5G deployment. The companies say the aim is to ensure the continued and seamless distribution of broadcast services to over 100 million US households, the reliable provision of data connectivity in rural areas and emergency situations, as well as services delivered to the government.

Enabling faster development

Chip-maker STMicroelectronics will include Sigfox's networking software in its tools that enable developers to bring their LPWAN-based products and solutions to market faster. The partnership ensures tool compatibility for STMicroelectronics' *STM32* family of general-purpose microcontrollers as well as other suitable products such as the *S2-LP* ultra-low-power sub-GHz radio transceiver, the *STSAFE-A1SX* secure element that comes pre-loaded with Sigfox network keys, as well as a wide range of sensors, power and power-management devices.

GetSAT to provide US with compact satcom terminals

In a multimillion dollar deal, the US Government will use GetSAT's satellite terminals to provide maritime and ground-based secure communications-on-the-move applications.

It will use the company's *MicroSAT* and *MilliSAT L/M* (land and maritime) micronised communications terminals. These are based on GetSAT's patented and fully-interlaced *InterFLAT* panel technology for transmitting and receiving signals on the same panel.

It's claimed the rugged terminals offer "significant savings" in size, weight and power usage. Constructed in a super-light compact installation, GetSAT says its platforms are easy to deploy and integrate, and can

GetSAT's MilliSAT and compact MicroSat (pictured) will be used by US agencies in ground and maritime applications.

be outfitted with various antenna sizes in accordance with bandwidth requirements of ground, air and marine applications. The firm further claims that its terminals feature a unique, all-in-one design that includes a BUC and modem optimised for harsh environments, as well as "ultra-low" power consumption.

GetSAT says *MicroSat L/M* offers options for both Ka- and Ku-band, providing autonomous operation for transmitting and receiving bandwidth data rates at more than 10Mbps. It says the mid-sized terminal, which has a panel size of 248 x 135mm and weighs around 8kg (depending on option), can be hand-carried in any environment.

The *MilliSAT L/M* has a panel size of 500 x 135mm and is described as a medium lightweight (around 14kg depending on option) portable on-the-move terminal solution that also offers options for Ka and Ku.

TETRA gateway radio solution soars to success in airport emergency simulation

Sysoco has successfully tested a TETRA gateway radio solution ahead of a planned roll-out at Lyon-Bron and Lyon Saint-Exupery airports.

The France-based radiocommunications specialist firm took part in a rapid intervention exercise to demonstrate the synchronisation of communications between SSLIA (the aircraft rescue and firefighting service), the Fire and Rescue Service of Rhone-Alpes, and fuel company Total.

The simulation involved attending the scene of an accident between an

A Sepura SRG3900 and Colour Console in a fire command post vehicle. PHOTO: SYSOCO

aeroplane and a fully-laden fuel tanker. It was set up to test the level of communications co-ordination between the services during an emergency.

Sysoco used Sepura's *SRG3900* from the firefighter's command post vehicle as a gateway. This enabled communication in local mode between all portable radios within a one to two kilometre radius, dependent on the relief and height of the antenna on a telescopic tower.

The use of gateway radios allows Aeroports de Lyon to run a system that links the SSLIA to Saint-Exupery airport's command post. Sysoco says the gateway solution will provide coverage into neighbouring areas of the airport and support nearby Lyon Saint-Exupery airport thanks to the 12m high telescopic tower.

Enhanced customer service for Vipnet

Croatian operator Vipnet is automating customer care and enhancing its network troubleshooting service with the help of Bulb Technologies.

As part of its digital transformation, Vipnet needed to replace its legacy troubleshooting systems across its mobile and fixed access infrastructure in order to enable the delivery of new services.

By using its *CEMPRESSO* platform, Bulb Technologies says the operator now has a "comprehensive" single diagnostics and troubleshooting tool in order to automate customer care across its xDSL, FTTx, mobile, and cable access infrastructure.

The company says that over a deployment period of just four months, it implemented a customer care system that was integrated with multi-vendor infrastructure elements for fixed access, including xDSL CPEs and OSS/BSS. It says this was based on real insights from periodic performance data collected from all devices (such as cable modems, xDSL CPEs, etc.), and delivering diagnostics and remedy tools for enhanced customer care.

Vipnet's chief digital officer Ivan Skender says digital transformation is no longer a "nice-to-have", but a fundamental driver for how the company's business will continue to serve, support and engage customers.

He adds: "Our ability to deliver personalised and enhanced customer service means that subscribers will now be able to interact with our service desks instantly at anytime and from anywhere through our mobile and web applications."

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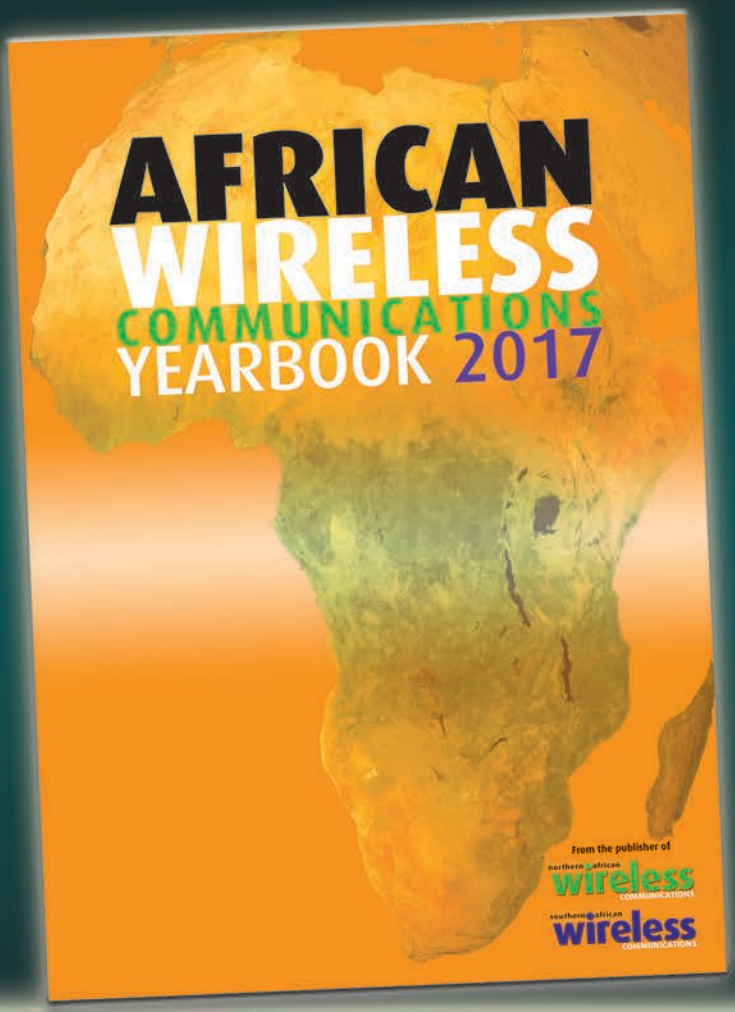

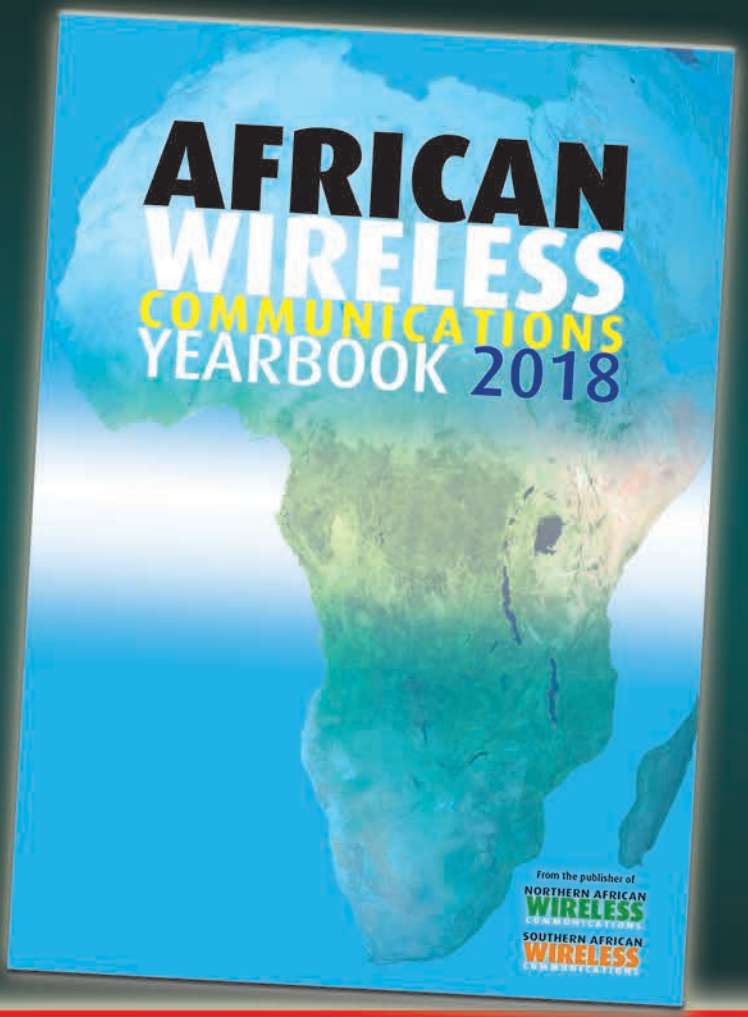

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