APRIL/MAY 2017
Volume 16
Number 2

northern african wireless COMMUNICATIONS

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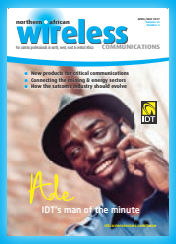

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MAY 2017
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SUBSCRIPTIONS:
Northern African Wireless Communications is a controlled circulation bi-monthly magazine. Register now for your free subscription at www.kadiumpublishing.com
Readers who do not qualify under the terms of control can purchase an annual subscription at the cost of £110.
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Printed in England by The Magazine Printing Company

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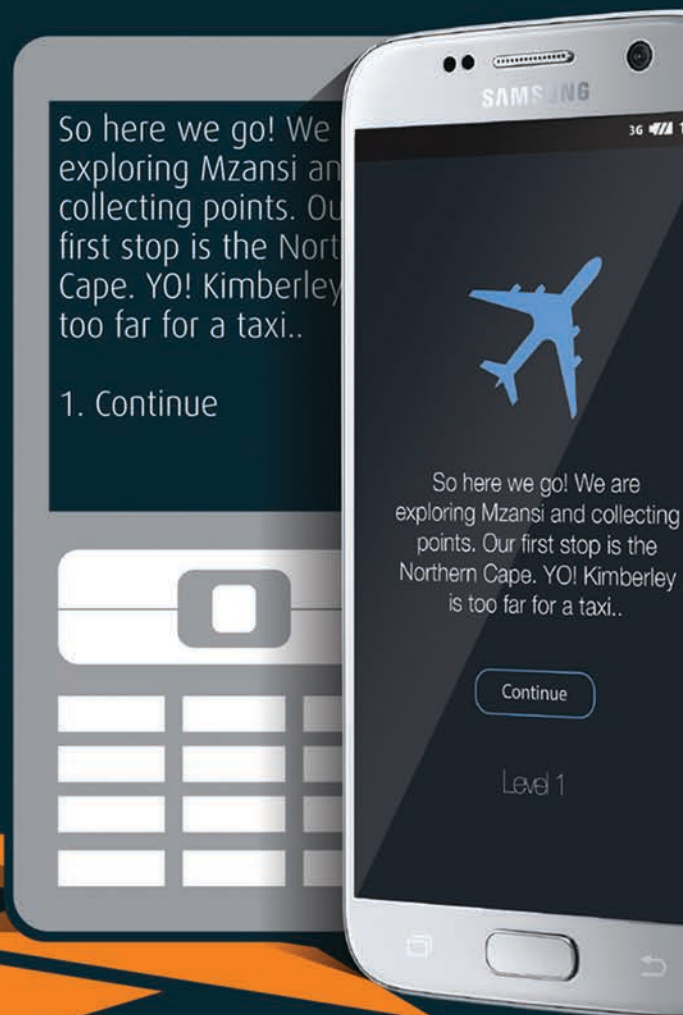

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IoT network deployed across Kigali to support smart city initiatives

From having very little network connectivity just a few years ago, Rwanda now has ambitions to become a smart city blueprint for other African nations to follow.

The country's government has launched a flagship Internet of Things project in Kigali which features technology supplied by Inmarsat and Nokia.

Inmarsat has deployed low power WAN infrastructure around the capital using the LoRaWAN protocol to connect sensors and devices in the IoT. The network went live at the beginning of May and will remain active for an initial period of a year. It has been developed with Actility, the France-based M2M and IoT specialist which Inmarsat recently invested in.

The network will provide city-wide coverage enabling a variety of organisations to develop and deploy IoT applications on a large scale, as well as allowing entrepreneurs to easily connect their front-end IoT devices through a middleware layer.

To demonstrate the IoT's transformative potential, Inmarsat plans to work with Jersey Telecom and other partners to deploy a number of proof of concepts and technology validations around Kigali.

These include a smart bus which will be equipped with satellite internet to provide ubiquitous connectivity for remote communities. The bus will also be LoRaWAN-enabled to provide real-time data acquisition in the communities that it services.

Engineers setting up Kigalis' smart city LoRaWAN network.

Rosine Mwiseneza, the 2016 winner of Rwanda's 2016 'Ms Geek' competition, has developed an IoT-based agricultural irrigation solution.

Other planned demos include a precision farming initiative intended to increase crop yield and better manage water resources, and environmental monitoring systems that will feature sensors installed in buildings to gauge air quality.

Inmarsat has also started a range of initiatives designed to educate and empower the next generation of students and entrepreneurs in Africa. It has launched a Smart Cities Education Programme in Rwanda and plans to replicate it in other countries on the continent in an effort to accelerate the deployment of IoT and smart city solutions. The programme will include a three-month student internship, as well as an IoT boot camp for students and entrepreneurs.

As part of the initiative, Inmarsat is also working with Rosine Mwiseneza, the 2016 winner of Rwanda's 'Ms Geek' competition which is designed to inspire female university students to employ technology to overcome local issues. Inmarsat is collaborating with Mwiseneza and her team to implement a prototype IoT-based agricultural irrigation solution for potential commercialisation. The goal is to create a scalable solution that can be used across Rwanda as well as Africa and the rest of the world via Inmarsat's global networks.

Separately, Nokia has been chosen by local company SRG as part of its collaboration with the government's smart city rollout. SRG will use a variety of products from the Finnish vendor including a mission-critical access network, IP and *Cloud Core* networks, as well as its *Impact Platform* with associated IoT applications.

Speaking at the Transform Africa Summit held in Kigali in May, Rwanda's youth and ICT minister Jean Philbert Nsengimana, said: "Through this project, we will not only improve people's day to day lives with improved services and security, but [also] anticipate long-term, positive socio-economic benefits."

Nsengimana claimed Rwanda was now a "pioneer" in deploying a smart city solution in Africa, and that the government's vision is to position the country as a technology hub. He added that plan was to share Rwanda's experience with other nations on the continent.

MTN Rwanda fined for "breaching" license obligations

The Rwanda Utilities Regulatory Authority (RURA) has imposed administrative sanctions on MTN Rwanda for what it says is non-compliance with its license obligations.

In a statement released in May, the regulator said MTN Rwanda provided services that contravened the directives that were previously issued to it in 2011. These concerned a regional IT shared services initiative where MTN Rwanda was part of the MTN South and East Africa IT hub based in Uganda.

At the time, RURA instructed MTN Rwanda to exclude itself from the arrangement and said failure to do so would be considered a "serious breach" of its license obligations.

Despite the directives, RURA said MTN implemented an interim phase for the hub from September 2012, and then fully "operationalised" its IT services management in Uganda in October 2014.

During a RURA regulatory board hearing on 12 May 2017, MTN admitted the breach. As a result, the operator now faces an administrative fine totalling RWF7.03bn (USD8.5m). This breaks down as a daily administrative fine of RWF5,000,000 from 26 October 2014 to 27 June 2016, and a daily fine of RWF15,000,000 from 28 June 2016 to 20 March 2017.

Following the announcement of the fine, MTN released a press statement acknowledging receipt of the penalty notification, and said that it had been in discussions with RURA about the issue since earlier this year. It added: "MTN Rwanda is currently studying the official notification and will continue to engage with the regulator on this matter."

MTN Uganda to use new network operations centre – News, p11.

Vodacom set to acquire stake in Safaricom

Vodacom CEO Shameel Joosub said deal will give shareholders access to a "high growth, high margin, high cash generation business operating in a high growth market".

Vodacom Group has agreed to buy Vodafone Group's 34.94 per cent stake in Kenyan cellco Safaricom.

Subject to all approvals, it will fund the acquisition by issuing 226.8 million new ordinary shares. Based on closing share prices at the time of the announcement in mid-May, the proposed transaction is valued at ZAR34.6bn (USD2.6bn).

Vodacom Group CEO Shameel Joosub said that given this is a related-party transaction, appropriate governance controls have been implemented to ensure that it will continue to be negotiated, evaluated and executed on an "arm's length basis." As a result, Vodafone, which currently owns 65 per cent of Vodacom, is precluded from voting at a general meeting in August where minority shareholders will vote on the matter.

According to Joosub, acquiring a strategic stake in Safaricom will provide Vodacom shareholders with access to a "high growth, high margin, high cash generation business operating in a high growth market". He said: "In addition to producing mutually beneficial opportunities for growth, it will create further incremental value through the close cooperation between the two businesses, particularly in driving *M-PESA* adoption across our operations."

Safaricom's *M-PESA* platform is regarded as an important driver of Kenyan economic growth. Joosub said the proposed transaction will improve Vodacom Group's presence in East Africa, jointly increasing the company's growth in financial services customers to 32 million.

In its 2017 financial year, Safaricom saw 8.8 per cent revenue growth. It is Kenya's leading mobile operator with a 71 per cent customer share, and is the only one with a nationwide network which currently provides 3G and 4G coverage to 85 and 25 per cent of the population respectively.

Satellite supports booming demand in DRC and Nigeria

Gilat Satcom is providing satellite connectivity to Orange in the DRC and ICSL in Nigeria as part of two separate major deals announced in April.

Following its acquisition of Tigo's operation in the DRC in 2016, Orange says it has seen greater demand for broadband and cellular services across all sectors in the country. Gilat Satcom and its local partner Raga Sat were previously providing 400Mb to the operator and this has now increased to 1Gb. Orange will use the additional capacity to support its international data, domestic and backhaul networks.

Gilat Satcom CEO Dan Zajicek said: "We are providing Orange with diverse routing options so that its vital network is stable and always-on."

Gilat uses O3b's satellite network into the DRC. The company adds that it has been providing broadband connectivity to enterprises and ISPs in the country since 2008, and that its partner Raga is one of only three local licensed hub operators.

Meanwhile in Nigeria, ICSL has chosen Gilat to connect 200 VSATs in the country.

ICSL provides broadband and connectivity services to homes and businesses nationwide. It's claimed the company is expanding rapidly, having built its reputation on providing reliable high-speed services and "excellent" customer service.

Gilat will also upgrade ICSL's hub in Lagos by installing the latest network optimisation software to reduce opex. The firm said it was chosen following a competitive tender involving multiple suppliers.

GET Wireless to implement national LoRaWAN in Tunisia

System integrator GET Wireless is partnering with Actility to develop a large scale IoT communication network in Tunisia.

Using LoRaWAN technology and powered by Actility's *ThingPark* platform, GET Wireless aims to create a network for its customers to support a wide range of applications.

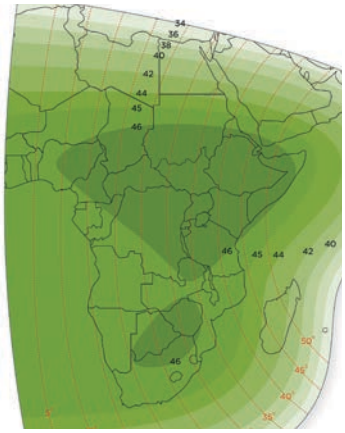
Malek Ben Jalel, the company's presales VP, says: "With the Tunisian IoT market now opened up for development by [the communications ministry], the way is clear for our customers to begin to deploy services, which they want to do as swiftly and efficiently as possible to take advantage of this new market."

Jalel is expecting to see a variety of IoT applications from customers. These include smart grid solutions for metering and managing energy demand; waste management and the collection routes in real time; and e-health services.

France-based Actility claims to be a pioneer of low power wide area network (LPWAN), large-scale infrastructure. It developed *ThingPark* as a carrier-grade IoT platform to enable service providers to accelerate their IoT strategy and go-to-market.

The platform's components include *ThingPark Wireless* for the delivery of long-range networks for low-power sensors and devices; and *Mash-up* which provides IoT protocol and data mediation services. Actility says the latter enables web applications to connect seamlessly with data from a vast range of different sensors.

Managed satellite network service offering for Africa



Launched in January 2014, the jointly branded *AFRICOM 1/THAICOM 6* has a C-band beam covering Africa from 78.5ºE.

Asian satellite operator Thaicom has teamed up with Intersat to launch a managed satellite network service for African enterprises and governments.

The platform will use capacity from *THAICOM 6/AFRICOM 1* which orbits at 78.5ºE. Intersat will manage the end-to-end service from its teleport and NOC in Nairobi which features iDirect's *Evolution* hub technology.

The two partners say their new offering provides a fully managed, customised turnkey service. When combined with *THAICOM 6/AFRICOM 1*'s "powerful" beams over Africa, they claim the platform leverages high degrees of efficiency to deliver cost-effective and competitive managed services to its customers.

Intersat and Thaicom add that the service will deliver "reliable and secure communications with a rugged network infrastructure and a quick turnaround time".

Thaicom CCO Patompob (Nile) Suwansiri says: "We have been working hard to stay ahead of the curve by offering flexible, cost-effective, end-to-end satellite services to our customers in Africa."

Hanif Kassam, CEO of Intersat, reckons his firm's "proven" managed service platform has taken a leap forward by taking advantage of Thaicom's experience as an end-to-end satellite service provider, and what he describes as its "powerful" C- band coverage across Africa.

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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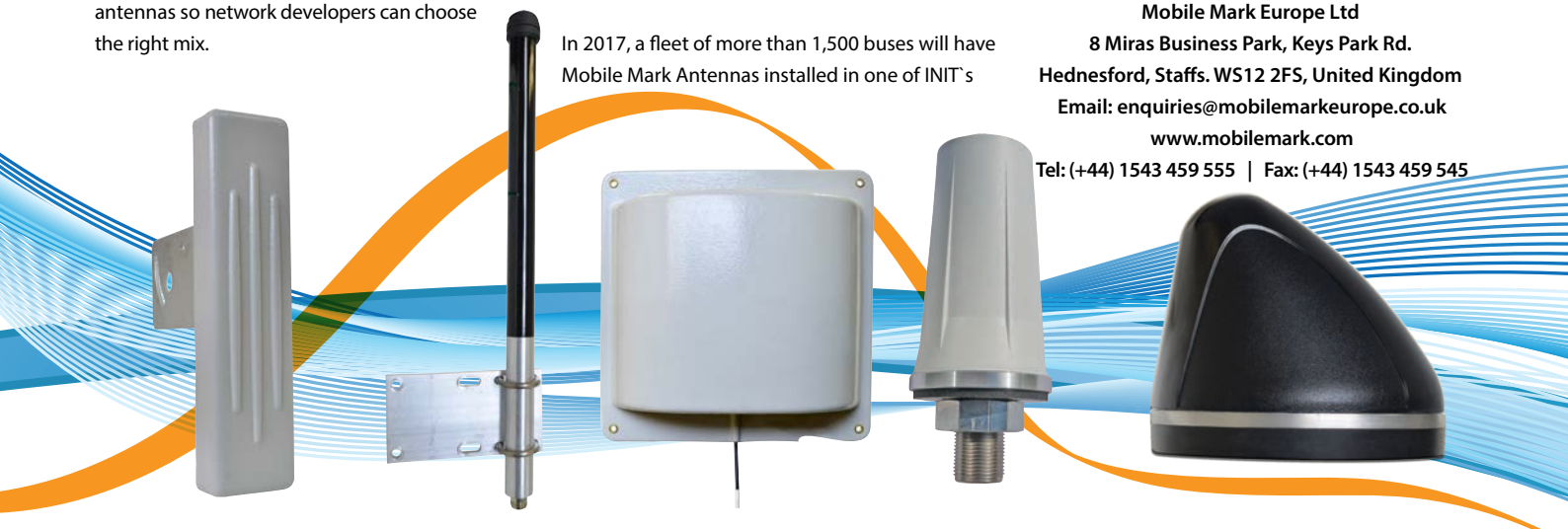

Kenya begins USF backed rollouts

The Communications Authority of Kenya (CA) has awarded contracts to three companies to rollout high-speed internet connectivity to schools under the first phase of projects financed by universal service funds.

Liquid Telecom, Xtranet Communications and Commcarrier Satellite Services will undertake the KES836m (USD8m) *Education Broadband Connectivity Project* which includes giving 898 rural secondary schools access to 5Mbps internet speeds. They beat 11 other firms in a competitive tendering process.

CA chairman Ngene Gituku said: ''The project will greatly improve education through digital learning by enabling access to online content by student and teachers. This will be actualised through creation of an education portal with digitised KCSE curriculum.''

The schools were identified using 'e-readiness' criteria agreed upon between the CA and the Ministry of Education. Qualifying institutions were expected to have: secure electricity supply from Kenya Power or a constant diesel/solar powered generator; secure computer lab with an uninterruptible power supply; at least 10 computers in good working order along with a printer and projector; and at least one full-time accredited teacher for computer studies.

The education project is one of two key initiatives recommended for immediate implementation following an ICT Access Gaps study commissioned by the CA last year. This also identified a need for more 2G voice infrastructure in selected sub-locations.

According to the study, 5.6 per cent of Kenya's population (about 2.66m people) have no access to telecom services. About 418 sub-locations have less than half of their population covered by services, while another 164 sub-locations have no access to 2G mobile services.

The study also established that 3G and broadband services are limited to urban areas. It found that only 2,454 sub-locations have 100 per cent population coverage of 3G and broadband, while 1,244 sub-locations have no access at all.

'Living the new wave' in Sudan

Sudani has gone live with an LTE-A network in Sudan. After completing the rollout of the network in Khartoum, the Sudatel subsidiary said it will expand the network to other major cities and towns throughout the year.

The operator worked with Huawei on the deployment. It is using LTE-FDD and carrier aggregation over 1800MHz and 850MHz frequencies.

Sudani said users are already benefiting from faster download and upload speeds for images, video and documents, a significant reduction in the time to load web pages, as well as reduced latency which improves gaming, video calls and web browsing.

Sudani claims it is now offering the country's fastest mobile data speeds.

The company is offering a wide variety of pricing packages for both pre-paid and post-paid users including what it said are affordable bundles for low-income customers.

Tarig Hamza Zainelabdin, CEO of Sudatel Telecom Group, said: "We have invested a significant amount in our 4G networks as we know that fast and reliable telecoms infrastructure will help our country's economic development.

"We want the people of Sudan to 'Live The New Wave' and enjoy the benefits of 4G in both their personal and business lives."

Vodafone aims to enhance broadband experience

Vodafone Egypt is aiming to enhance customer experience for its 39m fixed and mobile subscribers with the help of Procera Networks.

Under a multi-year, multi-million dollar deal, Procera will supply its analytics solutions to the operator. It claims the solutions take advantage of the "superior" visibility provided by its *PacketLogic* DRDL engine. It's claimed this enables the delivery of fine-grained application identification, despite the increasing use of encryption on the internet.

Vodafone will also use Procera's *ScoreCard* technology. This is said to provide a unique view of quality, with high frequency performance measurements in categories that subscribers can relate to such as web surfing, streaming video, social media, real-time gaming, upload/download, and voice applications.

Vodafone Egypt says the solutions will enable it to dynamically deploy analytics capacity to ensure customers are receiving a high-quality broadband experience across its entire network footprint.

According to Procera, the data gained from analysing *ScoreCard* results can be used to guide investment into network capacity and identify service creation opportunities for the operator's network planning teams.

Hashem Eid, the vendor's sales MD for the Middle East, adds: "With regional operators competing on network quality, reducing the cost and increasing the deployment flexibility of analytics through virtualisation is a business imperative."

MTN Rwanda launches "innovative" marketing platform

MTN Rwanda's acting CMO Gaspard Bayigane (left) says the partnership with Digitata will generate more awareness for advertisers. Also pictured is Digitata Insight CMO Henk Swanpoel.

MTN Rwanda is using a system from Digitata Insights to enable new digital marketing channels on its network.

Called *MeMe*, the platform has been developed to offer brands, advertisers and digital agencies the ability to reach out engage with consumers. It delivers selected marketing messages to MTN's subscribers on their mobile devices in "an unobtrusive manner", according to Digitata Insights. The company says its system has the ability to target consumers based on demographics, time of day and location, and that its "advanced" profiling capability ensures that the right person is targeted to help ensure messages are not viewed as spam.

MeMe is also said to offer various engagement options including 'call me back' messages, surveys, app downloads and voucher offers, as well as customised methods such as bespoke gamification campaigns.

MTN's use of the platform comes amidst heightened enforcement in Kigali of a 2013 by-law aimed at regulating outdoor advertising. This requires agencies to modernise billboards to improve safety, aesthetics and functionality. Digitata reckons MTN's launch of *MeMe* therefore provides a modern digital advertising solution.

The operator's acting CMO Gaspard Bayigane adds: "This innovative mobile marketing solution is the first of its kind in Rwanda. The strategic partnership with Digitata Insights will generate more awareness for advertisers and, in turn, drive additional sales and service opportunities through enhanced visibility on the *MeMe* platform."

SatADSL expands services

SatADSL is expanding its network's geographical coverage while simultaneously integrating new technology. The Belgium-based firm is working with global network specialist Talia to add an eighth satellite to its service package.

The two companies will leverage C-band capacity from *ARABSAT-5A* which covers Africa from 30.5°E. As a result, SatADSL says it can increase its satellite coverage, offer new technology, and give clients faster internet connectivity.

The company points out that it is "vendor agnostic" when it comes to choosing satellite services, and claims that its *Satellite Delivery Platform* (*SDP*) technically enables it to connect to any kind of satellite system.

It adds that on the technology side, the partnership with Talia means it can offer satellite services in C-band in addition to the already available Ka- and Ku-band frequencies.

"There are many advantages to using C-band frequencies," states SatADSL. "They can carry a large volume of communications; they are cheaper than Ka- and Ku-band frequencies; they offer more available bandwidth and higher connection speed; and they are less sensitive to heavy rain fade."

The company reckons all this makes C-band satellite services better suited for large service providers and subscribers with large bandwidth requirements such as major hotels.

Orange Egypt to give users real-time offers

Orange Egypt is using Openet's *Real-Time Offer Manager (RTOM)* along with reporting tools in a bid to improve subscriber experience and increase data revenues.

The cellco (formerly Mobinil) has deployed the platform to present customers with contextually appropriate offers in real-time. Openet claims *RTOM* has enabled Orange Egypt to better target upsell offers to its users, thereby increasing uptake rates and reducing churn.

According to the Ireland-based BSS specialist, the solution enables real-time offer presentation via intelligent contextual offer mapping. It says upsell offers are triggered by real-time customer context (e.g. usage information, application access, location, profile, etc.) in order to enhance their relevance. These are then sent in real-time to the subscriber's device and are presented by push notifications via Orange Egypt's self-care mobile app.

Openet reckons the ability to deliver contextually relevant and highly targeted offers will play a pivotal role in improving the operator's profitability. It claims by deploying *RTOM* combined with real-time reporting capability, Orange has significantly cut the time to market for developing and launching new offers and customer packages. It adds that this has further enabled the operator to react faster to competitor deals.

"Maintaining a differentiated customer experience is a core business driver," says Peter Refaat, head of broadband and digital services, Orange Egypt. "Our partnership with Openet ensures our BSS environment has the flexibility and agility to react to a rapidly evolving customer marketplace and ensure we deliver a superior service."

Ethiopian Railway Corporation chooses Flexenclosure's data centre platform

ERP Software Technologies (ERPST) in Ethiopia has ordered two data centres from Flexenclosure.

The systems integrator is a member of a consortium that is responsible for a major ICT infrastructure deployment for the Ethiopian Railway Corporation. Flexenclosure's prefabricated *eCentres* will house servers and software to manage and run the corporation's activities as it expands its rail network across the country.

"Ethiopia is engaging in a highly ambitious railway construction programme as the government lays the foundations for future economic growth," says ERPST CEO and owner Mark Nycander Ali. "ERPST is playing a central and vital role in the project, and we needed a tried and tested data centre solution we could rely on. With their track record of successful deployments across Africa, Flexenclosure's *eCentre* was the obvious choice."

The prefabricated *eCentres* are being built at Flexenclosure's factory in Sweden, allowing all critical systems to be fully tested before they are shipped.

Data centre construction is now under way at Flexenclosure's factory in Vara, Sweden, allowing all critical systems to be fully tested before shipping begins. Deployment will take place at two separate sites in Addis Ababa later this year.

Flexenclosure claims its turnkey *eCentres* and *eSite* hybrid power systems for off-grid and bad-grid cell sites have made it a "preferred" supplier to the continent's ICT market. With this latest deal in Ethiopia, the firm now has a presence in 21 African countries.

x-Mobility promises ARPU boost

x-Mobility is helping to drive a major East African network operator's quest to extend its subscriber base beyond its national boundaries and increase revenues.

According to the UK-based MVNA (mobile virtual network aggregator), as growing numbers of ex-pats live and work abroad, the desire to have a 'home' number to catch up with friends and family increases. At the same time, it says Africa's MNOs face increasing competition, especially from OTT providers who can take a significant slice of their ARPUs.

x-Mobility claims its *appVNO* platform will solve both of these issues for its unnamed East African customer. It says the platform will enable the cellco to offer an OTT app that gives subscribers a local mobile number – wherever they are – through a virtual SIM. Local or international users can then make and receive calls or texts from anywhere in the world at a flat rate without roaming charges and without the need to replace their existing SIMs.

The company reckons the East African operator can now increase its ARPU by targeting new international subscribers with a truly global service. It adds that for local subscribers, the OTT app offers transparent and predictable rates.

Furthermore, it's claimed the customer can launch its own MVNO style services beyond its national boundaries in as little as 8-12 weeks.

"The challenge of fighting falling ARPU is one many network operators face," says Shanks Kulam, co-founder and CMO of x-Mobility. "*appVNO* helps network operators overcome national boundaries without the loss of an existing SIM. This provides them with strategies for growing ARPU and increasing their subscriber base."

x-Mobility co-founder and CMO Shanks Kulam reckons *appVNO* helps MNOs overcome "national boundaries".

Siemens targets Africa for infrastructure growth

Siemens will work more closely with Uganda and Sudan as part of a strategy to double its order intake in Africa over the next three years.

Under agreements signed at the World Economic Forum on Africa held in Durban in early May, the German industrial giant and its partners will develop solutions in the areas of power supply, transportation, industry and healthcare.

One key area they will support includes training programmes for various technical fields in order to create a pool of well-trained local workers. As part of this, Siemens is joining the German government's *Make IT Alliance* to promote startups and technology companies across the continent.

Siemens boss Joe Kaeser said Africa's economies can develop their full potential with the right partner.

Siemens says it currently has more than 3,600 employees based in 15 countries across Africa. The firm adds that it is investing an average of EUR10m per year for training programmes.

The company claims it promotes economic growth in Africa through "far-reaching" partnerships in the fields of power generation, transportation and healthcare, as well as the digitalisation of industry. In Uganda and Sudan, its primary goal is to increase national power generating capacities and to connect the local population to the power grids. It has already developed financing solutions for its power projects in Egypt and Nigeria and is supporting its regional partners' efforts to implement these major infrastructure initiatives elsewhere on the continent.

"Our goal is to double our order intake in Africa to more than EUR3b by the year 2020," said Joe Kaeser, president and CEO, Siemens AG. "Africa's economies are gaining ground and can develop their full potential with the right partner. Siemens wants to support their sustainable development – with solutions and projects in Africa, for Africa."

NuRAN gets USD1.25m Nigeria order

NuRAN Wireless' *LiteCell 1.5* system will be used to connect underserved areas in Nigeria.

Earlier this year in February, the Canada-based wireless specialist announced that its GSM *LiteRAN* 2G system had been selected by wholesale operator Global Communications Extension Services as part of an initial deployment for an unnamed Tier 1 MNO in Nigeria.

As part of a second deal valued at around USD1.25m, the MNO is planning to connect more than 1,000 rural sites. If the deployment proves successful, NuRAN says it will lead to many additional sites being installed over the next three years.

According to the vendor, its *LiteCell* system presents an "economically viable" alternative for operators to bring connectivity to underserved areas. It boasts that the platform is the "world's most affordable, lowest power consumption, and easiest to deploy" GSM base station. The firm says the hand-carried, tower-mounted base station does not require any machinery to install nor any kind of shelter for protection. It also claims the unit's "ultra-low" power consumption helps to minimise capex associated with solar panels and batteries, and opex in the case of diesel-powered sites.

When combined with its *NuBSC* and *LiteSat*, NuRAN reckons the *LiteCell* achieves "industry-leading" bandwidth optimisation, thereby keeping the opex of satellite-backhauled sites to a minimum.

Mediterranean data centre goes live

European technological consortium Open Hub Med (OHM) has gone live with a data centre to make Italy the bridge between the internet networks of North Africa, Middle East, Europe, Asia and the rest of the world.

Hosted in the research area of Italtel in Palermo, the 1,000m² data centre is said to be designed with the "most advanced" technology systems which guarantee continuity of service, and scalability of internal infrastructure and power supply.

OHM says the modularity of the facility's pre-cabled fibre and electric systems means clients can easily install their equipment in racks or take advantage of those it provides, quickly and affordably.

OHM's new data centre in Carini, Palermo includes 1,000m² of floor space that can be upgraded to 4,000m², up to 4000KVA of power, military grade fencing, and more.

According to OHM president Valeria Ross, the consortium behind the data centre "boasts the most renowned and illustrious names in Italian networking". Founding members include: Eolo, Equinix Italia, Fastweb, In-Site, Interoute, Italtel, MIX (Milan Internet Exchange), Retelit, SUPERNAP Italia, VueTel Italia and XMED. Interoute has already activated its transmission systems at the site. Fastweb and Retelit are also pending activation, with others to follow soon.

Ross adds that now that the first phase has been completed with the addition of the major landing station infrastructure, the goal is to become the Mediterranean's centre of aggregation for traffic coming from the south and east.

IoT to help deliver clean energy to millions off-grid

BBOXX and Aeris are collaborating to deliver clean energy to millions of people living in off-grid communities in the developing world.

UK company BBOXX designs, manufactures, distributes and finances plug and play solar systems. Its core products are a range of solar 'battery boxes' that allow users to power small appliances, from lights and mobile phones to TVs and computers.

US-based M2M specialist Aeris offers IoT connectivity in East and Central Africa. The collaboration between the two will ensure that the battery boxes have reliable IoT connectivity and can be remotely monitored. BBOXX will install Aeris' global SIM at the point of manufacture, thereby reducing both supply-chain costs and deployment time. BBOXX adds that by utilising Aeris' single global access point name, its solar system can also be deployed anywhere in the world on a simple plug-and-play basis, removing the necessity to configure local network settings.

BBOXX's solar 'battery boxes' can power domestic appliances such as TVs.

Aeris will also provide its *AerPort* connectivity management platform for IoT devices. This will give BBOXX real-time access to data usage, alert management and device-connectivity management over each SIM's lifecycle.

The firm adds that Aeris' global support of major mobile standards such as GSM, CDMA and LTE, means that it will be able to deploy its devices across the world as it looks to expand.

Sparkle shines with new client POPs

Sparkle, the international service arm of TIM Group, has added Zajil and Aldea to its portfolio of service providers hosted at its Sicily Hub in Palermo.

Kuwaiti-based Zajil provides ICT services in the Middle East and North Africa. It aims to use a new POP at Sparkle's hub to provide its enterprise and wholesale customers with best performing connectivity to North Africa and Europe.

At the same time, it's claimed Zajil's banking, finance and media customers will experience improved latency and application performances from their HQs in the Middle East and Europe.

In a separate announcement, Aldea is also teaming up with Sparkle to extend video transport services coverage in Africa, the Middle East and Europe.

A wholly owned subsidiary of the Marcatel Group, Canada-based Aldea specialises in the delivery of managed video solutions for the transmission of live sports, news and other media events over fibre networks.

As a result of the partnership, it's claimed media companies in Africa, the Middle East and Eastern Europe will benefit from Sparkle's "extensive" 560,000km global fibre network and Aldea's "comprehensive" portfolio of video distribution services. As well as extending its video service capabilities into these new regions, the agreement will also enable Aldea to provide customers with direct access to its existing video network in 20 countries in the Americas and Western Europe.

According to Sparkle, Sicily Hub's unique location in the Mediterranean makes it closer to North Africa and the Middle East than any other European peering point. It says this puts it at the crossroads of most international cable systems connecting Asia and the Middle East to Europe.

ZTE launches new NOC for MTN Uganda

ZTE has launched a new network operation centre (NOC) in Uganda in an effort to deliver what it describes as a "superior" network operation and maintenance service.

The company claims its facility is the country's most advanced NOC. The firm is currently working with MTN Uganda to provide its network with a full scope of managed services for its equipment from various providers. The total number of network components are planned to increase from more than 4,000 today to more than 5,000 by 2019.

The centre will serve MTN's entire network in Uganda. According to ZTE, the establishment and opening of the NOC will improve the operator's network quality and simplify its management. It adds that the aim is also to: "Fortify a solid foundation of deepening and widening business exchange between China and Uganda, thus creating a new means of cooperation that is in pace with modern times."

The inauguration of the NOC in mid-April was attended by local dignitaries that included the country's ICT minister Frank Tumwebaze (second from right), MTN Uganda CEO Wim Vanhelleputte (far left), and other senior personnel.

■ In separate news, the MTN Foundation has pledged to invest up to UGX500m (USD138,585) into community transformation projects across Uganda this year. The projects will fall within three areas that include education, health and other national priority areas. The foundation says the key focus will be on education which forms the cornerstone of its community development investment strategy.

HorizonSat covers Africa

UAE-based HorizonSat will work with Russian satellite operator Gazprom Space Systems to deliver satellite services in Africa. Under a capacity deal signed in late April, it will use Gazprom's *Yamal-402* to provide internet connectivity in the Central African Republic, DRC, Kenya, Tanzania, and other countries. According to Gazprom, its satellite's Southern Beam offers good coverage of Central and Eastern Africa, while cross-strap with *Yamal-402*'s European Beam will enable HorizonSat to use its teleport in Munich which is connected to high-speed internet backbones.

NCC calls for new ideas

The Nigerian Communication Commission (NCC) has invited academics to submit research ideas capable of replacing or enhancing foreign technologies in the country's telecoms industry. The NCC said the aim of its initiative was to help build capacity in tertiary institutions and promote Nigeria's contribution to the pool of communications technologies in use. Following a preliminary assessment, selected proposals will be further evaluated by another level of assessors.

Ethiopia TV platform

Ethiopia's Information Network Security Agency (INSA), which is responsible for the transformation of the country's high-tech and security industry, has launched its new TV platform. Following a multi-year contract, it will use capacity on *EUTELSAT 8 West B* to deliver services from the new Ethiosat platform. The satellite orbits at 7/8°W which, according to Eutelsat, is the prime video neighbourhood for North Africa and the Middle East. Ethiosat plans an initial launch of nine national channels.

Delivering voice growth through a unique mix of wholesale & retail

IDT, a world leading carrier of international voice, offers African network operators a unique and innovative way to drive incremental minutes and revenue through its retail arm. In an aggressive marketplace, no other voice carrier can deliver a strategic partnership that offers the stability and opportunity to grow voice and, in some ways, reclaim revenue lost through OTT providers.

The unique 'Africa opportunity' stems from IDT's retail business through its BOSS Revolution brand. This offers communication and financial services, enabling foreign-born customers to stay in touch and share resources with their loved ones around the world.

The African opportunity

BOSS Revolution currently generates more than 8 billion annual minutes globally, over a billion of which terminates through 70+ CLI-certified African direct connects. More than 430,000 Africans based in the US use BOSS Revolution to call home, with other regions of the world generating retail minutes into Africa through the service and the UK spearheading this with double digit growth.

IDT's penetration is so high amongst the foreign-born community in the US that it reaches 1 in 4 of this population. In today's flat and aggressive voice market, operators need to look towards identifying strategic partnerships in order to realise new revenue streams. Because IDT has the reach and access to Africans calling home, it can work together with African network operators to provide preferential rates to its retail customers and grow this base to drive even more volume their way. And at the same time, IDT can trade this retail volume to carry their outbound traffic, creating a uniquely compelling proposition to grow the mutual businesses. The company calls this 'twice the opportunity'.

Ben Hirsch, IDT's chief marketing officer, explains more: "BOSS Revolution is an online portal created for retail stores that delivers our products and services through the retailer into the hands of consumers. What's key about this portal is that it takes cash of the street.

"A number of our foreign-born customers do not necessarily have credit or bank accounts but want to access electronic payments for services. BOSS Revolution not only provides those rich services to them but actually allows them to be consumers in today's marketplace."

BOSS Revolution's core element is 'PIN-less calling'. It took the old-fashioned hard card and

did away with the need for users to enter personal identity numbers, or worry about paying various fees for international communication.

Since it was launched six years ago, Hirsch says BOSS Revolution has delivered on its promise for customers of no pin, no fees, no expiration. And because it has become a trusted brand, he says IDT has been able to launch additional services.

"These include international mobile top-up which allows people to add credit to the pre-paid service of friends and family back home. Because this was a sort of remittance-in-kind service, we realised that we were able to go into other services like money transfer. We now have licenses in all US states, where we operate as a money transfer provider under the BOSS Revolution brand, enabling customers to send money all over the world, with a growing African customer base using this service to send money back home too."

In addition to pre-paid Visa cards, virtual Visa cards, gift cards, bill payments and a variety of other services, the company continues to grow both BOSS Revolution's telecoms and payment services across a variety of platforms.

While the retailer remains IDT's strongest channel for BOSS Revolution, the company also offers a variety of services across its web portal, in-store kiosks, voice portals, and now through mobile applications as well.

"The BOSS Revolution app has been downloaded over four million times now," says Hirsch. "I am proud to say that we are one of the few apps in the app stores that actually generates hundreds of millions of dollars in revenues, which is a fantastic place to be. It shows that we continue to provide customers with value across both communication and financial services.

"So BOSS Revolution continues to grow, and our services continue to provide value to customers which really goes back to the proposition of ensuring that they stay in touch and share resources with friends and family back home.

Twice the opportunity

What makes IDT unique in the telecoms space is the ability to transfer the value of those 15 billion proprietary minutes from the foreign-born customers to the international telecoms providers that need to terminate those international minutes.

That's where the company's wholesale division comes in, as Hirsch explains: "It creates value by being able to work with network operators to terminate the retail minutes we generate, which our wholesale team can then trade with to carry their outbound traffic.

"Working with fixed and cellular operators, we're able to combine our retail and wholesale operations to provide a completely unique proposition to help grow the respective businesses – achieving incremental minutes through preferential rates for IDT's retail customers, and increasing revenue even further by dropping dollars, not just minutes, into networks, with the growth we're experiencing from our financial services available through BOSS Revolution too."

Strategic partnerships: the key to growth

In today's voice market, network operators need to shift their thinking towards more strategic partnerships in order to grow. Partnering with a wholesaler that can carry their outbound traffic but also leverage retail volumes into their network is an assured direction they can take. IDT is really the only voice carrier that is uniquely positioned to deliver the volume commitment needed to grow the businesses on both the wholesale and retail side, representing 'twice the opportunity' for an operator to increase their revenues.

You can stay in touch with IDT and find out how their retail products and services influence the wholesale carrier industry, through their newly launched content website.

idtvoice.com
idtcarrierservices.com/twice

Opera invests USD100m in Africa

Opera Software plans to invest USD100m over the next two years to facilitate the growth of Africa's digital economy. The web browser specialist says its aim is to speed up internet adoption on the continent and strengthen the digital ecosystem with local partners.

Norway headquartered Opera says Africa is on its way to transforming itself into digital continent with the rapid adoption of the mobile internet. For the past five years, the firm claims its *Mini* browser has been a "key facilitator" in bringing more than half of the region's internet population online by featuring tools for lowering data costs.

Richard Monday, Opera's VP for Africa, says: "We aim to invest heavily in Africa, to build a local platform and grow with the local business partners. This platform will expand the user base for content providers, e-commerce businesses, operators, OEMs and others to strengthen the African internet ecosystem."

Opera says it is now focusing on making the next generation of browsers to cater to the needs of local web users.

Opera's Africa VP Richard Monday (third from left) says the firm will build a platform to strengthen the continent's internet ecosystem. Also pictured from left to right: Jørgen Arnesen, global marketing head; Folarin Komaiya, business development director, Opera Nigeria; and Song Lin, COO, Opera Software.

For example, to bring more first-time internet users without the fear of high data costs or lack of local relevant content, the company plans to invest in developing what it describes as a "state-of-the-art" AI engine for smartphone users.

"Opera users in Africa will get fully personalised and localised content delivered to their browser, the entry point for their internet experience, while the data usage can be reduced up to 90 per cent," claims the firm.

The company adds that it is now working with more than 47 top tier African publishers covering 107 web sites on this initiative. It is also seeking local partners to integrate value-added services, mobile payment and data bundling into its browser product.

In addition, Opera is expanding with new offices in Lagos and Nairobi to support business and product development. These will add to the premises it currently has on the continent in Cape Town and Johannesburg. The firm plans to hire around 100 people for its new offices over the next three years.

According to Monday, nine of the top 20 countries globally that use *Mini* are from the continent. Last November, Opera announced it had notched up 100 million monthly users in Africa, and claims *Mini* is now the region's most popular mobile browser.

This is partly corroborated by research recently published by Jumia. In its latest *Mobile Africa Study*, the Nigerian online retailer carried out surveys in 15 countries which generate more than 80 per cent of Africa's GDP: Algeria, Nigeria, Morocco, Tunisia, Egypt, Mozambique, Ghana, Côte d'Ivoire, Cameroon, Rwanda, Uganda, Tanzania, Kenya and Senegal.

Jumia revealed that while 50 per cent of customers on the continent access its mobile site using *Google Chrome*, that figure falls to 28 per cent in Nigeria. Here, *Opera Mini* is more popular, with 41 per cent of Jumia Nigeria's mobile traffic coming from the browser.

Nigeria's dollar liquidity shortage likely to continue as oil revenues stay lower

Nigeria's dollar liquidity constraints are likely to persist for the foreseeable future despite the recent improvements in foreign exchange earnings and availability, according to Moody's Investors Service.

In May, the credit ratings agency published a report that said dollar usage in the country is "unlikely" to return to previous levels, and that oil prices are "highly unlikely" to return to the USD100 per barrel level that would lead to greater forex inflows.

Moody's said the slump in oil prices in 2014-15 more than halved Nigeria's forex earnings, with exports falling from an average of around USD90bn between 2013 and 2014 to USD46bn in 2015. It added that this was compounded by attacks on oil infrastructure in the Niger delta region which led to reduced production volumes.

The report continued by saying that during 1Q17, the Central Bank of Nigeria (CBN) began to increase the availability of forex through two new exchange rate windows and interventions in the interbank market. But Moody's pointed out that this has been heavily supported by USD1.5bn in international debt issuances rather than non-oil exports. It believes that, more importantly, the recent rebound in spot oil prices and the recovery in production since 4Q16 are what will support dollar availability this year.

Nigeria's current account has already moved from a deficit of USD15.3bn in 2015 to a small surplus in 2016. Moody's forecasts a positive balance of payments outlook for 2017, taking into account additional external borrowing and stable reserves of around USD30bn, despite some volatility expected during the year.

Ericsson downgraded to 'junk' status

Moody's has downgraded Ericsson's credit rating to Ba1. This is generally regarded in the market as 'junk' status as it is below investment grade.

Alejandro Núñez, a Moody's VP, senior analyst and lead analyst for Ericsson, said: "The downgrade reflects the anticipated negative impact on the company's operating earnings and cash flow in 2017 and 2018 due to rising restructuring charges and provisions, leading to credit metrics that will no longer be commensurate with investment-grade ratings."

The downgrade is said to be the first time since 2005 that Ericsson has been given such a rating. An Ericsson spokesperson reportedly said it was not expected to have any impact on costs for corporate bonds and loans that the company currently has.

Following Moody's announcement in early May, Ericsson shares fell by up to 2.7 per cent and were trading 2.6 per cent lower at SEK57.30 in Sweden.

Motorola Solutions accuses Hytera of patent infringement

In a complaint filed with the US International Trade Commission (ITC) in late March, Motorola Solutions claimed China's Hytera Communications is "unlawfully" importing and selling two-way radio equipment and systems and related software and components that infringe its patents.

It has called for an immediate investigation by the ITC, an exclusion order to halt the importation of what it says are "infringing products", and a cease-and-desist order to stop the marketing and sale of these in the US.

In a statement issued during the International Wireless Communications Expo (IWCE) held in Las Vegas at the end of March, Hytera said it "embraces competition" and respects the intellectual property rights of others.

The statement said: "Motorola Solutions' new action continues its pattern of legal manoeuvring instead of competing with Hytera in the marketplace. By waiting to file its ITC complaint on the first day of [IWCE] – the largest US trade show for PMR providers – Motorola Solutions is transparently using its legal filings to generate publicity."

Hytera added that it will defend itself against the allegations and remained "fully confident" that it will prevail.

But Mark Hacker, general counsel and chief administrative officer of Motorola Solutions, said: "Hytera asserts that it embraces legitimate competition, but there is nothing legitimate about the illegal copying and misappropriation in which it has engaged. We are committed to vigorously defending our valuable intellectual property as we continue to drive innovation for our customers across the globe."

Intracom and Nour partner for connectivity and services in MEA

Global telecom systems and solutions vendor Intracom Telecom has signed a strategic partnership agreement with Nour Smart Solutions to provide connectivity and value-adding content services to hotels, residential compounds and service providers in Africa and the Middle East.

Under the partnership, Intracom Telecom will supply its *fs|cdn Anywhere* multiscreen video services platform to enable the delivery of interactive video content to TVs and smart connected devices. Nour Smart Solutions will be bundling the platform with its connectivity and communication services in an effort to introduce a differentiating end-to-end solution offering to customers.

CLX acquires Dialogue

CLX Communications has acquired Dialogue Group, the UK-based global provider of mobile messaging and security services, at a price of GBP32m (around USD41m) on a cash- and debt-free basis. CLX has also secured financing through a credit facility provided by Svenska Handelsbanken and Danske Bank.

Founded in Sweden in 2008, CLX specialises in cloud-based communications services. It says the acquisition of Dialogue will help it in its aim to build what it claims will be the world's leading CPaaS (Communication Platform as a Service) company.

Through the acquisition, CLX says it will strengthen its customer base in the UK and Australia and add Tier 1 operator connections in New Zealand, Singapore, Malaysia, Bangladesh, Vietnam, Cambodia, Japan, Philippines, Indonesia and Egypt.

In addition to delivering messaging solutions to enterprises, Dialogue provides A2P SMS monetisation software and services to MNOs around the world and primarily in APAC. It's claimed that the company processes around 1.7 billion messages annually across more than10 countries.

The merger will also add *Sentinel*, Dialogue's security software solution for mobile operators, to CLX's product portfolio.

Integration work will start immediately. It is expected to take 12 to 18 months and is targeted to be completed by 3Q18.

Following the acquisitions of Mblox, Sinch, and Xura Secure Communications, this latest deal with Dialogue is CLX's fourth buyout since its IPO in 2015.

African growth for Facebook accelerates

Facebook says the number of people connected to its platform across Africa has grown 42 per cent since 2015 to reach more than 170 million monthly active users. Of these, it says 94 per cent access the services via mobile devices.

Carolyn Everson, VP global marketing solutions (left) says Facebook wants to help SMBs grow locally and regionally across the continent. Also pictured is the company's regional director for Africa, Nunu Ntshingila (middle) and Nicola Mendelsohn, VP EMEA.

"Facebook is deeply committed to Africa, a mobile-first continent where seven in 10 of all connected people use the platform," says Carolyn Everson, VP of global marketing solutions. "Many people in Africa are coming online for the first time, unleashing new possibilities for people and businesses alike. We're also seeing growth of small- and medium-sized

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
5/4/17	Zeng Xuezhong	–	–	ZTE Corporation	EVP – resigned due to "personal reasons"
10/4/17	Selim Bouri	Airbus Secure Land Communications	Head of sales & programme delivery for Middle East & APAC	Kapsch CarrierCom	Director, head of MEA & Turkey/emerging markets
11/4/17	Chun-Yuan Gu	ABB	President, AMEA	ABB China	MD
25/4/17	Adeline Lum	Neural Technologies	CFO	Oracle	Director of business operations for APAC applications
4/5/17	Vince Molinaro	Procera Networks	Board director	–	Retains current position as chief customer officer & EVP with Juniper Networks
4/17	Jean-Philippe Gillet	Intelsat	VP & GM, broadband	Intelsat	VP EMEA
11/5/17	Gregory McCray	ADTRAN	Board director	–	Retains current position as CEO of the Access Company, the Alphabet subsidiary that oversees Google Fiber
16/5/17	Mounir Qalam	SatADSL	Senior sales	Tigo Chad	CCO

INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
12/2/17	Various investors	Actility	Series D funding round	USD75m	The IoT LPWAN specialist's new investors include Creadev, Bosch & Inmarsat. They now join existing investors such as Idinvest, Bpifrance, Ginko Ventures, KPN, Orange Digital Ventures, Swisscom & Foxconn. A second closing later in April will see additional investors join in support of what Actility said was an "over-subscribed" capital raise which was achieved without involving banks.
25/4/17	BICS	TeleSign Corporation	Acquisition	USD230m	BICS claims the combination of its global network & reach to MNOs with TeleSign's cloud platform & "state-of-the-art" mobile identity & authentication solutions creates the first global end-to-end Communication Platform as a Service (CPaaS).
3/5/17	Actility	Abeeway	Acquisition	NA	France-based Abeeway specialises in geolocation solutions for LPWANs. By combining the firm's patented location software & products with its *ThingPark* platform, Actility says the acquisition will give it a "best in class" portfolio of IoT location services to support service providers & IoT solution vendors.
8/5/17	MTN Group	Iranian Net	49% stake	ZAR540m (approx.)	MTN plans further investments of around ZAR3.4bn in both equity & loans to facilitate Iranian Net's rollout targets over the next five years. The fixed broadband provider has a national license for the construction & operation of an optical data transmission & access network across Iran.

businesses that are driving economic development, companies that Facebook wants to help grow locally and regionally across the continent."

As a result of the expansion, Facebook moved its Johannesburg offices into new premises. Everson says the new offices are part of the company's "ongoing commitment" to invest in the African market and work with innovators across its key target countries.

Nunu Ntshingila, Facebook's regional director for Africa, reckons the firm has grown from "strength to strength" since first establishing a direct presence in sub-Saharan Africa in 2015. "We have enjoyed working closely with entrepreneurs, partners, developers and small businesses as they have used Facebook as a platform for growth. It's inspiring for us to learn from the continent and to play a role in helping people and organisations connect with the world," she says.

Telenor to sell additional shares in VEON

Telenor is selling 70 million of its common shares in VEON (formerly VimpelCom). The public offer is in the form of common shares listed in Euronext Amsterdam and American Depository Shares (ADSs) on NASDAQ. Each ADS represents one VEON common share.

Telenor currently owns approximately 416.7 million ADSs, which represents 23.7 per cent of VEON's total outstanding common shares. Underwriters have agreed a public offering price of USD3.75 per ADS/share, resulting in net proceeds to Telenor of USD259m. These will be included in Telenor's cash flow statement for 2Q17.

This latest transaction follows Telenor's earlier sell-down of around 164 million VEON ADSs in September 2016.

Following the sale, VEON will no longer be treated as an associated company in Telenor's financial reporting. All of the previously recognised currency translation differences, amounting to an accounting loss of NOK7.5bn including tax effects related to the hedging instruments, will be reclassified to the income statement.

Telenor points out that the effects of reclassification do not impact its total equity. The effect will be recognised in the second quarter 2017.

Mobile Mark acquires Comtelco

US-based antenna specialist Mobile Mark has agreed to acquire Comtelco Industries which makes a wide range of LMR antennas for both mobile and site installations. Following the acquisition, which is expected to take effect in June 2017, Comtelco's manufacturing facilities will be moved from its existing location in Illinois to Mobile Mark's facilities, also in Illinois. Mobile Mark says this will allow continued use of Comtelco's 'Made-in-the-USA' badge.

In separate news, Mobile Mark has acquired the *X-WAV* and *TMA* antenna ranges from Luxul Wireless, a brand of Legrand. According to the firm, Luxul's products hold a "unique place" in the wireless industry with their patented designs and quality construction.

Mobile Mark president and CEO Michael Berry says: "The acquisition of Luxul Wireless' *X-WAV* and *TMA* antennas will immediately expand the range of antenna solutions we can offer our customers and will position us to develop additional innovative antenna solutions."

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
31/3/17	Huawei	China	FY16	CNY	521.6 (bn)	NA	NA	Net profits were CNY37.1bn (USD5.3bn), an increase of 0.4%. In 2016, YoY revenues in EMEA grew 22.5% from CNY127,719m to CNY 156,509m.
18/4/17	ZTE	China	1Q17	RMB	25.75 (bn)	NA	NA	27.8% rise in first-quarter profit due to increased sales of carrier network solutions & smartphones.
27/4/17	Intelsat	US	1Q17	USD	538.5	409.8	(0.29)	First quarter net loss of $34.6m. Total On-Network revenues reported YoY decline of $2.4m to $491.4m. Transponder services reported aggregate decrease of $1.5m. Decline mainly due to lower pricing on renewing wide-beam services for enterprise & wireless infrastructure related to activity in Africa, & non-renewals of point-to-point services from customers operating in Africa & Latin America.
28/4/17	Gemalto	Netherlands	1Q17	EUR	651	NA	NA	Revenue 8% lower at constant exchange rates. SIM sales down 14% to €118m due to a lower market share as MNOs upgrade to removable SIM. This is coupled with soft demand in Middle East & Africa as the result of stricter subscription registration processes.
28/4/17	SES	Luxembourg	1Q17	EUR	540.6	357.6	NA	Revenue up 12.2% over prior period & up 1% YoY. Eight satellite launches expected between now & 2020, but only *SES-16/GovSat-1* & O3b's next spacecraft will offer African coverage.
4/5/17	Motorola Solutions	US	1Q17	USD	1,281	224	0.45	Sales up 7% YoY due to growth in EMEA & Americas. Expects revenue growth of 2% to 3% in 2Q17 compared to 2Q16.
9/5/17	Zebra Technologies	US	1Q17	USD	865	149	0.16	1.9% increase from 1Q16. "Better-than-expected first quarter sales performance in our Enterprise segment," said CEO Anders Gustafsson. "We also retired another $80m of debt, keeping us on track for at least $300m of pay down for the full-year."
10/5/17	Bharti Airtel	India	4Q17	INR	219,346	79,928	NA	Overall quarterly revenues down 12.1%. African earnings grew 2.6% in constant currency terms, with data revenue up 14.5% YoY to INR157m, accounting for 17.7% of total income from the continent.
11/5/17	Eutelsat	France	3Q16	EUR	364.3	NA	NA	Revenues down 4.9% reported & 4.2% like-for-like, but fixed broadband earnings for the quarter up 36% YoY at €24m. African broadband initiative to be launched in June to support revenues from next fiscal year. Revenues in line with expectations.
11/5/17	VEON	Netherlands	1Q17	USD	2,281	861	0.19	VEON (formerly VimpelCom) reports total revenue increase of 13% YoY, benefiting from currency appreciation, while organically decreasing by 1%, due to weakness in Algeria where total income fell 15%. Djezzy continued to face customer churn & ARPU erosion, the latter exacerbated by price competition. Company expects this pressure to continue.
16/5/17	Gilat Satellite Networks	Israel	1Q17	USD	63.9	4.2	0.03	YoY revenues increased 21% from $52.7m in 1Q16. Targets for 2017: revenues between $280 to $300m; GAAP operating income between $4 & $8m; & adjusted EBITDA of between $20 & $24m.
17/5/17	Cisco	US	3Q17	USD	11.9 (bn)	NA	0.50	Total revenue down 1%. Americas flat, EMEA flat & APJC down 2%. Product revenue performance led by wireless & security, which grew 13% & 9%, respectively. Switching revenue increased 2%. Next-gen routing, collaboration, data centre & service provider video revenue decreased by 2, 4, 5 & 30%, respectively.

Vertiv unveils fully-integrated system for micro data centres across Africa

Vertiv (formerly Emerson Network Power) says it has come up with an innovative approach to deploying micro data centres. The firm has designed what's claimed to be a complete IT infrastructure solution in a fully-integrated enclosure.

MANUFACTURER: Vertiv

PRODUCT: SmartCabinet

MORE INFORMATION: www.vertivco.com

SmartCabinet is a single unit that offers plug and play installation for a broad range of applications such as telecom sites, retail stores and branch offices.

It comprises thermal management, power distribution, remote monitoring, infrastructure management, and what Vertiv describes as a "high efficiency' UPS from its *Liebert* brand.

Ready to use from day one, the company says the *SmartCabinet*'s compact design means that no dedicated IT room is required. It adds that the unit is pre-engineered, pre-configured and factory tested to ensure system compatibility, efficiency and reliability.

As well as targeting micro data centres with limited space, Vertiv says the enclosure can also be used by companies looking to quickly upgrade their server rooms and local nodes to support increased data processing for content delivery, such as mobile computing and the IoT.

Enhanced protection for SS7 and Diameter networks

AdaptiveMobile has enhanced its *Signalling Protection Gateway* (*SPG*). The mobile network security specialist says it has expanded the platform's core offerings with "powerful" new network integration, deployment and routing capabilities.

MANUFACTURER: AdaptiveMobile

PRODUCT: Signalling Protection Gateway

MORE INFORMATION: www.adaptivemobile.com

The *SPG* is based on technology from Dialogic's signalling platform. The partnership is said to enable AdaptiveMobile's *Signalling Protection* to overcome the limitations of legacy networking technologies and enable fully virtualised platform deployments.

According to AdaptiveMobile, as attacks via signalling protocols become increasingly sophisticated, security based on simplistic signalling protection gateway platforms does not provide sufficient protection.

The firm adds that in many networks today, security solutions are compromised by the limitations and expense of legacy network infrastructure or incumbent equipment suppliers.

Signalling Protection has been designed to secure the *SS7* and LTE/Diameter networks. AdaptiveMobile says the platform uses a combination of carrier-grade signalling firewall, advanced analytics, and the "unique" threat intelligence it has gained from working with nine of the top 10 operator groups.

The firm adds that the protection can be located at strategic network positions to ensure blocking of privacy and fraud attacks.

Wave 2 combined with LTE CAT6 for "superior" Wi-Fi

Zyxel Communications says the *LTE5366* is one of the first LTE indoor gateways with 802.11ac Wave 2 Wi-Fi technology. This offers 4x4 streams for higher speeds, better coverage, and support for more devices and applications.

The device is designed to provide users with mobile broadband connectivity to take advantage of the latest carrier aggregation technology compatible with LTE, DC-HSPA+/HSPA/UMTS and EDGE/GPRS/GSM. Zyxel says this enables connectivity with a variety of mobile broadband services all over the world.

MANUFACTURER: Zyxel Communications

PRODUCT: LTE5366

MORE INFORMATION: www.zyxel.com

With LTE category 6 compliance, the *LTE5366* is said to deliver downlink data rates of up to 300Mbps (at 2.4GHz) – according to the company, that's twice as fast as category 4 models and even outperforms fixed-line Ethernet.

It adds that by using the latest MU-MIMO 802.11ac technology, the gateway doubles Wi-Fi performance of Single User MIMO in venues where concurrent wireless access activities are intensive.

Cable assemblies ideal for high data rate applications

Amphenol RF has expanded its coaxial cable assembly offering with a new line of SMPM cable assemblies. It reckons they offer the "ideal" pre-configured solution for high frequency applications with 50 Ohm impedance requirements.

The firm claims the assemblies offer "excellent" performance up to 20GHz. The are said to feature high quality SMPM plug connectors which are designed to accommodate both radial and axial misalignment in a small package size.

The connectors are terminated to industry standard 0.085- and 0.047-inch hand formable cables. Amphenol says they're available in standard lengths ranging from three to 48 inches (100mm to 2,000mm) to complement any RF design.

The company adds that due to their high frequency range and compact size, SMPM cable assemblies are ideal for high data rate applications such as broadband communications, instrumentation and 5G wireless solutions.

It adds that their reliability under conditions of radial and axial misalignment also makes them ideal for use in environments that are exposed to shock and vibration, such as instrumentation equipment, aerospace, and military applications.

MANUFACTURER: Amphenol RF

PRODUCT: SMPM cable assemblies

MORE INFORMATION: www.amphenolrf.com

First NB-IoT support for interference measurement

Viavi Solutions' (formerly JDSU) *CellAdvisor* base station analyser now supports the unique signal analysis required for narrowband Internet of Things (NB-IoT) connectivity.

In what it believes to be an industry first, the company says this new capability meets the service providers' needs for immediate testing for the overlay IoT infrastructure that must co-exist seamlessly with traditional mobile networks.

MANUFACTURER: Viavi Solutions

PRODUCT: NB-IoT support for CellAdvisor

MORE INFORMATION: www.viavisolutions.com

The software-based NB-IoT testing feature can be installed as a license on existing *CellAdvisor* handheld instruments. It will enable users to measure the interference and performance impact an NB-IoT signal may have on the LTE wideband signal.

Viavi says it also confirms whether the signal has the reach and coverage required to serve the number of devices in the assigned geographic area, taking into account considerations such as building penetration.

The vendor says engineers can use the new feature to analyse signal power levels, digital demodulation and interference down to the single physical resource block for the signal under measurement.

Hybrid system combines satellite and cellular to connect maritime users

NSSLGlobal has unveiled its first-ever hybrid cellular/VSAT services for maritime vessels.

Using its new *Cellular Marine System*, the company claims maritime vessels can connect to robust, high-speed internet with download speeds of up to 100Mbps for commercial and crew welfare broadband use.

MANUFACTURER: NSSLGlobal

PRODUCT: Cellular Marine System

MORE INFORMATION: www.nsslglobal.com

NSSLGlobal says the system is supported by a mobile roaming service established through an unnamed "major" global operator, and allows the customer to automatically transfer from satcoms to 3G and 4G connectivity as appropriate. It adds that the service will help customers gain the most out of their onboard communication system when operating in coastal areas or waiting to get into harbour.

The new 3G and 4G connectivity will complement NSSLGlobal's maritime VSAT *IP@SEA* service. This is said to combine "extensive" Ku- and C-band coverage with some of the fastest speeds in the industry. *IP@SEA* comprises six global teleports supporting 24 satellite beams and two network operation centres to achieve 'always-on' connectivity.

D-Link promises fast Wi-Fi with new AP

Built for outdoor use, D-Link's new dual-band wireless access point is designed to operate in temperatures from -30 to 60°C.

The IP67-compliant *DWL-8710AP* uses 802.11ac, and supports a maximum of 300Mbps at 2.4GHz and 867Mbps at 5GHz.

MANUFACTURER: D-Link

PRODUCT: DWL-8710AP

MORE INFORMATION: www.dlink.com

D-Link claims band steering ensures that 5GHz-enabled clients can achieve maximum performance without being bottlenecked by legacy 2.4GHz 802.11b/g/n devices. The firm adds that AC *SmartBeam* technology enables the AP to have greater reach.

The *DWL-8710AP* includes two GbE network interfaces which enable administrators to bridge other devices, such as a camera or another access point, into the network. Other features include support for 802.3at PoE, mounting brackets for installation on a wall or pole, and a metal and polycarbonate housing. The AP weighs just over 2kg (with antennas), and measures 250 x 220 x 45mm.

Like other models in its range, D-Link says the *DWL-8710AP* can be centrally managed when working in conjunction with its unified wireless switch or wireless controller.

ALSO LOOK OUT FOR

Qualcomm first to support new Wi-Fi standard

With the launch of the *IPQ8074* system-on-chip (SoC) and *QCA6290* for client devices, Qualcomm Technologies says it has become the first company to announce end-to-end commercial solutions to support 802.11ax.

The firm says the growing number of connected devices, diversity of traffic, and density of overlapping networks currently overloads Wi-Fi spectrum and threatens the quality of connected experiences. As a result, the 802.11ax Wi-Fi standard focuses on expanding capacity and making better use of spectrum to maintain excellent connectivity in more complex environments.

Qualcomm has designed the *IPQ8074* SoC to deliver maximum capacity, range and performance for the next generation of Wi-Fi devices. By utilising 12-streams (eight 5GHz and four 2.4GHz), 8x8 MU-MIMO, and supporting eight 80MHz streams, it's claimed the device quadruples capacity, delivers up to 4.8Gbps, and maintains fast connections over larger coverage areas.

The *QCA6290* client device SoC is said to offer an up to 4x increase in user throughput in crowded networks. It supports 2x2 MU-MIMO and realises the full benefits of the 8x8 MU-MIMO by supporting the advanced 8x8 sounding mechanism. Qualcomm says peak speeds of up to 1.8Gbps are offered through dual band simultaneous connections that combine 2.4GHZ and 5GHz bands, and higher order 1024 QAM.

It adds that the *QCA6290* is optimised to reduce power consumption by two thirds compared to current .11ac devices, on top of support for the 802.11ax standard's power save features.

Although all these benefits will be greatest for .11ax-based devices, Qualcomm claims its solutions will also improve the performance of devices that use the .11ac and .11n standards.

Maintaining good contact

While LTE looks set to dominate the market for new PMR products in the coming years, there's still plenty of life in traditional critical comms technology, as SARA FREWEN finds out. Additional reporting by RAHIEL NASIR.

The worldwide critical communications products market is anticipated to be worth USD18bn by 2019, according to a report published by IHS in 2016. While economic constraints have forced public sector cuts in many countries, its analysts said they are seeing strong growth on a global scale.

The two largest market segments are command and control solutions, and licensed mobile radio (LMR) terminals, which together account for more than two-thirds of critical communications revenue.

Public safety applications continue to make up a major part of the critical communications industry, and IHS estimates that the installed base of public safety and security users make up 43 per cent of the PMR market.

It is this potential that is driving the established critical comms vendors to continually innovate and develop new products. For example, Motorola Solutions reckons it's come up with a "one-box" digital radio system that reduces setup time to less than 15 minutes.

DIMETRA Express is an expandable single site TETRA system that integrates base radios and a switch. Motorola says it was created in response to demand from customers and partners for a product that was easy to deploy and cost effective enough to be used for smaller projects.

The system is claimed to be lightweight and energy efficient, providing all the voice, SDS and telephony services users require in a small physical footprint. Motorola says engineering expertise is not required as it can be set up and configured by a *Windows* or *Android* laptop or tablet, and is then managed and operated through web-based applications and tools. It adds that just a single IP address is required which further reduces setup as well as ongoing maintenance costs, making it easier to integrate into an existing IT network.

Hytera unveiled two new products at PMRExpo that took place in Germany last November. They included the *PD985 DMR* handset which features single frequency repeater mode. According to the company, this enables the device to use one slot to receive signals and another slot to transmit it in the same frequency in DMO mode to extend communication distance. It's also equipped with Bluetooth 4.0 which not only supports audio transmission but also programming, and 3W audio output with Hytera's new noise cancelling technology.

The *PD985* has a protection rating of IP68 to comply with the highest dust and waterproof standards, and Hytera says the radio will continue to function for up to four hours after submersion under water to a depth of up to two metres.

Other features include 'Smart Battery'. The vendor says this makes it easier to monitor battery life and charging time which is "dramatically" reduced. There's also support for 32GB Micro SD cards enabling recording of up to 576 hours of digital/analogue audio.

The *DIB-R5* outdoor unit was the second product Hytera launched. The company says this expands its family of TETRA 2/TEDS base stations with an outdoor version for

ACCESSNET-T IP radio systems. Designed to be very small and space saving, the unit can be fixed, for example, to a wall, radio mast or in a tunnel. Furthermore, Hytera says the *DIB-R5* has low power consumption, enabling deployment in areas with critical electrical power supply. The firm adds that it has an IP65 rating making it dust- and waterproof, and operates in temperatures ranging from -30°C to +55°C.

Earlier this year, France's Airbus Defence and Space demonstrated what it described as the "future of digital radio". It said that in the foreseeable future, authorities will increasingly share photos, videos and other multimedia files with each other for which they require the appropriate technology.

At the European Police Congress held in Berlin in February, Airbus revealed that it had developed a product portfolio that enables multimedia communication in a secure radio network. Speaking at the time, Markus Kolland, head of sales and programme delivery for Europe and Africa at the company's Secure Land Communications division, said the most important thing is for TETRA to continue to prevail and be expanded with broadband technology. "Existing and future investments in the radio network will therefore continue to be of value," he said.

Airbus' range of broadband products also integrates applications for smart end devices, such as the *Tactilon Dabat* secure *Android* smartphone that has a built-in TETRA radio device *(also see '4G or not 4G?' feature, Q4 2016 issue)*. This will now feature *Stashcat*, an encrypted messenger and file-sharing application that supports voice communication. Airbus claims it is a more secure choice for critical comms users than publicly available messenger applications.

The company developed the app in conjunction with Heinekingmedia, a German-based digital signage and professional secure messaging specialist. It is one of several companies Airbus is currently working with as part of its new app development programme, *SmarTWISP*. This aims to create a new application ecosystem that addresses the daily needs of PMR users.

Motorola Solutions' "one-box" *DIMETRA Express* is an expandable single site TETRA system that integrates base radios and a switch.

The LTE alternative

Although LTE has been on the critical comms agenda for some time, its market entry has been slow and protracted because of its numerous challenges, such as the cost of spectrum.

However, it is now emerging as a leading candidate for critical communications broadband networks. In addition, with the recent approval of the mission critical push to talk (MCPTT) voice standard as part of 3GPP Release 13, LTE has also become an attractive substitute for providing LMR-like voice services.

Thomas Lynch, critical communications research director at IHS Technology, says: "End-users from several sectors are already implementing LTE, and some have chosen it over TETRA or DMR. As well as public safety, this is occurring mostly in small and contained networks, often in remote locations, for example, oil and gas platforms and in mining operations."

IHS projects that this growing trend will have an effect on existing critical communications technologies, especially on LMR terminals and infrastructure. Lynch says the trend has been seen in developing regions such as Africa where it has been easier to 'leap over' technology generations rather than set up an LMR infrastructure beforehand.

The TCCA (TETRA and Critical Communications Association) believes it is vital that mobile broadband services are provided to public safety users as soon as possible. However, it also points out that the inclusion of such functionality does not, by itself, make commercial cellular networks suitable for mission critical operation.

As a result, the TCCA has some significant reservations about the use of commercial mobile broadband networks for public safety applications, and recently issued advice to governments who may be considering LTE for their emergency services networks *(see 'LTE: what's needed for critical comms users', overleaf)*.

Noel Watermeyer, sales director for Altech Alcom Matoma, says that once the public safety features and functionality are fully standardised, developed by a reasonable number of OEMs, and introduced to market, there is no question that LTE will be a valuable tool. "Popular belief amongst the international user group is that currently LTE can provide an invaluable overlay, specifically for broadband data (as opposed to voice and data) to complement the more mature narrowband technologies such as TETRA (still the preferred public safety technology in our region), APCO P25, DMR and dPMR, which [all] remain appropriate solutions for 100 per cent of the users."

To solve the interoperability dilemma, Watermeyer says a number of OEMs have introduced solutions for cross technology communication. He reckons that because of the standardisation problem, the best solutions are OEM specific: "The trend initially set in Europe of partnering with a specific OEM is therefore set to continue so long as this international situation persists."

Above left: Hytera's recently launched *PD985* DMR handset features single frequency repeater mode. Above right: the *DIB-R5* extends the vendor's range of TETRA 2/TEDS base stations with an outdoor version for ACCESSNET-T IP radio systems.

Making it all work together

At the end of January, Airbus announced its *LTE4PMR (Long Term Evolution for Professional Mobile Radio)* project to develop a full-fledged mission critical broadband solution. It described this as an "accelerator" in the standardisation, development and implementation of the specific products and features required to meet the public safety sector's secure communications needs.

Airbus has set up an R&D consortium with French telcos and universities, and says that a "substantial" amount of resources will be invested over a period of 27 months as part of *LTE4PMR*.

The project solution will offer what the firm says are "typical" PMR features, such as MCPTT, complex data, and video transmissions. It will also create the base station, core network and terminal chipset enabling the deployment of mobile broadband secure communication networks in various frequency bands.

The final results of *LTE4PMR* will be presented at the end of 2017. Airbus says they will consist of a "comprehensive and interoperable" set of mission-critical solutions leveraging commercial mobile broadband services as well as dedicated networks in the 400/450MHz and 700MHz frequencies."

Until then, many PMR specialists continue to develop and launch customised products that use current standards of LTE technology.

For example, France-based ETELM, believes LTE offers "excellent" options for high-speed data and use of mobile applications, and therefore has a "massive future" in the market. It has developed a range of 4G linked technologies, including TETRA, DMR and analogue base stations, which connect directly to any standard LTE core network without any gateways or specific interfaces.

Late last year, the company unveiled a new eNodeB LTE base station which is claimed to have the longest reach ever developed for PMR 4G technology. "The *e-LBS* is a major breakthrough for our 4G linked solution and introduces our own

LTE technology to the mission critical sector," says ETELM sales and marketing director Nicolas Hauswald. "It will allow operators to boost their coverage areas from existing locations and make seamless calls between subscribers, and give the best of all technologies in a single network." He adds that the *e-LBS* uses LTE's multi-broadcast features to ensure the widest coverage area, including group calls which are essential to mission critical users.

ETELM says it has developed a fully integrated approach to avoid, wherever possible, the limitations of the gateway approach. Hauswald claims the firm's linked multi-technology solution is the only one in the market that is fully integrated to LTE.

ETELM claims its *e-LBS* base station has the longest reach ever developed for PMR 4G technology.

"Our solution implements the LTE protocol stack in every base station, thereby allowing our radio sites to directly and seamlessly connect to the LTE backhaul. In the future all operators will use the LTE core network, so having the ability and flexibility to connect onto this industry standard network is important for inter-technology communications."

Interoperability is key for PMR specialists working with LTE. For example, Hytera plans to launch its dual mode TETRA/LTE and DMR/LTE devices later this year, including a version with an additional small screen on top of the radio. It says the *Android* devices will support Wi-Fi, Bluetooth, RFID, GPS, NFC and video, and will work on LTE frequencies. And Motorola Solutions' already available *LEX L10* combines the features of its rugged *APX* series radios with capabilities more often associated with smartphones.

Jerry Nachmann, the firm's regional field and solutions marketing manager, believes that while public safety users will always need a fail safe option to communicate by voice (whether using TETRA or other PMR technologies), their ability to share photos and videos is "highly beneficial" to helping solve and prevent crimes.

"Public safety LTE provides additional layers of information that can help in critical situations. If you think of a situation where a terrorist or a criminal is on the loose, command centres could, over an LTE network, push out a picture of the suspect to the LTE devices officers are carrying and help apprehend the suspect with greater ease."

DAMM's *TetraFlex* app enables PTT in TETRA groups. It can be run on smartphones that use the *Android, iOS* and *Windows* mobile operating systems.

But sharing photos and videos are just part of the picture, and Nachmann points out that public safety LTE networks with smart devices provide a "great platform" for applications that improve a public safety agency's efficiency. Denmark-based DAMM is likely to agree here. Its *TetraFlex* client app offers TETRA over LTE and provides coverage extension as well as data capacity for videos and pictures.

It also supports full integration with the company's *TetraFlex* radio systems, and enables PTT in TETRA groups, individual calls, messaging, video streaming and GPR tracking. According to the firm, no radio gateways are required. It adds that the app supports *Android*, *iOS* and *Windows* operating systems, and offers a vendor-independent soft terminal for non-critical voice and data communications through Wi-Fi, UMTS and LTE networks. ■

Vodacom claims African first with LTE critical comms demo – World News, p30.

LTE: WHAT'S NEEDED FOR CRITICAL COMMUNICATIONS

The TCCA (TETRA and Critical Communications Association) has identified four key focus points for governments to consider if they are looking to implement LTE-based public safety networks. In a recently published white paper, it says commercial mobile network operators already have the ability to deliver mobile broadband to public safety services. While many public safety organisations are already taking advantage of this, the association says it is only for non mission-critical applications, with the traffic carried by a 'best efforts' commercial service.

For safety critical applications – such as dispatching ambulances, sharing details of terrorist suspects, and dealing with major incidents – the TCCA says it is essential to use networks that are suited to mission-critical communication, taking four key areas into account:

Spectrum: For a public safety operator to build its own infrastructure anywhere in the country, it will be necessary to obtain suitable spectrum. Those responsible for public safety communications must review the opportunities for obtaining spectrum. They must engage with the appropriate government ministries and the national regulator to establish how this can be made available for public safety, and to enable choice in the provision of broadband data services.

Security: Secure communications are essential to enable confidential information to be passed safely over the network, and broadband data services will likely carry more confidential information than existing voice networks. Security mechanisms are being designed into future LTE standards, but the standard is not currently at a security level to match purpose-designed PMR standards. A review of the security arrangements available in LTE systems, and in any commercial network that is used, should be undertaken by suitably qualified staff.

Ownership: As with any business, commercial mobile networks are subject to being bought and sold. Such transfers of ownership may be to companies anywhere in the world. Some governments are cautious about critical national infrastructure being owned by foreign firms. Those responsible for public safety communications should consider the national government policy with regard to foreign ownership and operation of telecoms infrastructure.

Funding: Assuming that spectrum has been secured, the degree to which dedicated infrastructure can be built will be dependent on funding. Nationwide infrastructure will be relatively costly in many countries and an optimal balance between dedicated and commercial networks will need to be found. The use of commercial networks can significantly reduce the capital investment for public administrations and also the time required to implement public safety services. However, their use will incur ongoing service charges. It is likely that the re-use of existing base station sites and sharing infrastructure can mitigate some of these costs.

The TCCA believes that there is no doubt mobile broadband services are likely to bring significant benefits for many public safety users, enabling faster and more targeted responses to incidents, as well as efficiency savings. But it adds that there is no simple answer to how mobile broadband should be provided to public safety users.

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Unearthing a solution

PHOTO: ACACIA

With remote operations, often in harsh climates and difficult terrain, companies in the mining and oil & gas sectors present unique challenges for communication network specialists.

Mining Projects Development (MPD) Congo SA is a subsidiary of Anglo-Swiss multinational mining company Xtrata. In May 2007, it was granted an exploration license to evaluate iron ore deposits in Lekoumou, a district in the south west region of the Republic of Congo. Known as the 'Zanaga' project, the mine is expected to produce 45 million tons of iron ore concentrate a year once it reaches peak capacity.

The iron ore exploration zone is 500km from MPD Congo's head office at Pointe-Noire and is accessible only by four-wheel drive vehicles. There is no electricity supply to the area and limited GSM coverage, presenting a challenge for tracking supply vehicles that travel between the two sites as well as communicating with staff.

MPD Congo thus needed to establish reliable, high-performance voice and data comms to manage its daily operations on site and ensure staff safety. But providing coverage across an area spanning some 40,000km^2 with virtually no infrastructure would necessitate a wireless solution that was robust enough to withstand a harsh environment and could be operated using solar power.

Drawing on its 30 years of experience providing radio communications in Africa, Motorola partner Soicex Electronique recommended *MOTOTRBO IP Site Connect* combined with *TRBONet* dispatch software developed by application partner Neocom. Eight *MOTOTRBO DR 3000* repeaters with solar powered generators were connected using 10 *PTP 58500* and four *PTP 58300* wireless point-to-point (PtP) Ethernet bridges to provide what Motorola says is reliable, high-speed voice and data connectivity throughout the coverage area, even in extreme conditions.

The company's *DP 3601* portable digital handsets and *DM 3601* mobile radios with integrated GPS are used to track the location of 200 personnel and 100 vehicles in real-time, while *IP Site Connect* is said to ensure "seamless" communication wherever they are on site and enables them to send voice and text messages to staff at MPD's head office. According to Motorola, automatic roaming allows the radios to select the best signal available without requiring users to manually tune their radios so they can enjoy high-quality communications at all times.

The *TRBOnet* client-server software application is being used by MPD Congo to enhance dispatch by facilitating the monitoring of large amounts of traffic on its network. The locations of vehicles and staff across the site are mapped on big screens set up in control rooms at the exploration site and head office. Motorola says multiple work groups can be linked at the touch of a button – an important feature for emergency situations. It adds that *TRBOnet* also enables the recording of voice conversations and the storage of GPS data such as vehicle location, speed and route. These data can then be transmitted in real-time across the PtP wireless links.

It's claimed the "robust" network has reduced MPD Congo's dependency on intermittent GSM signals and provided consistent voice, SMS and GPS communications to enhance the management of its ore exploration operations and ensure staff safety. Being able to track the exact location of trucks carrying iron ore and supplies along the 500km of road between the sites has greatly improved dispatch efficiency and enabled a quicker response to break downs and emergencies.

In addition, Motorola says cost savings have been realised through the ability to use the PtP wireless bridges instead of expensive satellite links for internet access, and travel costs have been reduced by using video conferencing for meetings.

"In a relatively short period of time, we were able to establish an advanced and robust communications network with hardly any existing infrastructure," says Paul Reed, logistics director at MPD Congo. "*MOTOTRBO IP Site Connect* ensures we have constant voice and data communications with staff and vehicles on the move, which is critical when operating across such a vast and isolated area."

Exploring with satellite in Cameroon

SkyVision is providing reliable communications to help a mineral exploration firm and a local branch of a British mining company with its research and exploration sites located throughout Cameroon.

While the companies have not been named, SkyVision says one of them is credited with the discovery of one of the largest iron ore deposits in the country. But even so, it says finding the right area for establishing mineral exploration proved complex for the firm.

Exploration involves in-depth research of resources using geophysical and geochemical methods. It is therefore necessary to conduct geological, terrain and regional surveys in order to select the best prospective sites for the fast, easy and cost-effective location of ore deposits. Exploration field camps are established by teams in areas where various test sites have already been setup. Usually, such sites are located far from standard telecoms networks and therefore rely heavily on satellites. As such, satcoms is a critical factor for the successful establishment of exploration field camps and must be reliable.

When the mining firm's IT manager had to select a reliable service provider to provide communications to the exploration sites all across Cameroon, he turned to SkyVision: "I had previous experience with two other satellite service providers, but they failed to satisfy my requirements and the expected service availability and quality," he says.

SkyVision says its broadband connectivity allows the company to establish high-quality voice and high-speed data connectivity where no terrestrial infrastructure is available. The service provider claims its reliable links allow exploration field camp teams to send files back to headquarters and conduct telephone and conference calls critical to expediting their exploration data analysis. In addition, employees are able to use the link to communicate with their families.

The mining company now operates multiple exploration sites simultaneously, with all of its field camps served by SkyVision.

Helping to connect remote explorers

As the above case studies show, discovering and exploiting new mining opportunities is becoming increasingly difficult. The relative scarcity of resources is driving organisations to operate in more remote environments which are usually cut off from telecoms infrastructure and services, making mission-critical communications extremely challenging.

But no matter what phase the mine site is in – exploration, development, operation or relocation – there is a vital need for effective communications between remote sites and corporate office to improve efficiency, meet production targets and commercial goals.

SatADSL says mining firms are going to more remote environments cut off from telecoms, making mission-critical comms extremely challenging. PHOTO: ACACIA

Belgium-based SatADSL is certainly no stranger to dealing with such challenges, and when a large mining operator began establishing new sites in West Africa, it approached the communications specialist for its help.

The unnamed operator already had a central office in Accra which serves as its regional African Hub. This was connected through a leased line but the remote sites were in areas without any telecoms infrastructure and needed to function as an extension of the company's corporate network. Employees at the sites needed to run essential business tools, especially SAP, as well as transfer large data files and access the internet for emails and web browsing.

SatADSL established a private network between the operator's new remote exploration sites and its HQ in Europe and regional hub in Ghana. This enabled the real-time sharing of information between all locations for improved decision-making, bypassing what SatADSL describes as "unreliable" local telco networks. All communications are secured through VPN tunnelling using private IP addresses and traffic encryption.

It's claimed that a complete operational network was achieved within six weeks of the initial order. SatADSL says its solution was based on a highly available leased satellite capacity on the *Astra 4A* satellite that covers sub-Saharan Africa. It was uplinked via a teleport in Luxembourg, and connected through multiple and redundant fibre links to the internet backbone delivered by Tier 1 providers. Two ruggedised low-cost VSAT terminals were installed in each remote location to deliver two separate networks: one for professional and corporate activities, and the second for entertainment and social purposes.

According to SatADSL, onsite equipment (from Newtec) was installed and operational in less than four hours using the *Point & Play* feature of the deployed antenna and *Plug & Play* procedure of the modem. The IDU was pre-programmed by the company's technical support team in Brussels before shipping, while its in-country local partner for each site provided installation and maintenance training.

Workers at each location can now access the web, email, *Skype*, as well as other VoIP and IP video conferencing applications. SatADSL provided its SOHO pre-paid service package for each remote site which means customers pay for bandwidth only when used.

It adds that the customer has also been supplied with a "powerful" web-based *Customer Management Tool* (*CMT*) for service management and monitoring. SatADSL says this will enable the company to monitor service quality (antenna pointing, signal-to-noise ratio, etc.) and service usage (data rate and volume consumed), as well as activate new sites, set the appropriate service plan for them, and terminate/upgrade/downgrade existing sites depending on their needs.

In addition to enabling access to social media and tools for staff entertainment, SatADSL says both service plans delivered "highly" cost-effective IP-based satellite services for the mining firm's business communication needs. This included the initial site survey, shipping, customs clearance, training, installation and testing.

SatADSL says its solution has delivered a high-speed, highly available platform for the mining company's voice and data services in each of its new or future remote sites in Africa.

Site surveillance

As well as presenting communications challenges because of their remote locations, the terrain where mines operate is unforgiving and working conditions are perilous. Effective technology is therefore essential for improving safety.

Above left: MPD Congo is using Motorola's *MOTOTRBO IP Site Connect* with a solar power generator. Centre: the iron ore exploration area is 500km from MPD's head office at Pointe-Noire and only accessible using 4x4 vehicles. Right: *DM 3601* mobile radios with integrated GPS track the location of 100 vehicles in real-time.

To monitor the safety of miners and secure its site, an unnamed manganese mining company based in Kuruman, South Africa, needed communications infrastructure that would transmit high-quality video from all mining site locations back to a central control centre. The wireless surveillance network had to satisfy several demands. It needed to deliver real-time, high-quality video with no interruption, meet extensive regulations and approval processes for each component installed, and operate in a tough mining environment with harsh elements including heat, snow and dust. On top of all that, it had to be capable of overcoming radio noise in a relatively flat mining terrain and transmit in non-line-of-sight conditions.

Miro Distribution, one of South Africa's major distributors, recommended RADWIN's wireless point-to-point and point-to-multipoint (PtMP) solutions for the job. Specialist company I3S Security Solutions carried out the deployment and installed more than 150 IP-based security cameras that covered the entire site, from the construction village and mine shaft, to the entry turnstiles and everything in between.

I3S used RADWIN's *2000* PtP and 5000 PtMP radios in the 5.8GHz range and established a wireless network covering 12km^2. It says the systems offer a number of advantages including ruggedised, IP67-certified systems suited for installation in tough outdoor environments, and high throughput of up to 250Mbps for the *5000* and up to 200Mbps for the *2000*. The devices are also said to offer long range and low latency for 24/7 wireless surveillance, fast set-up times, and low power consumption. In addition, RADWIN's solutions allowed I3S to effectively utilise the camera network as well as provide infrastructure for the access control system.

As well as meeting all the manganese mining company's stringent technical and performance requirements, the vendor claims its wireless links have improved visibility of field mining operations, enhanced the safety and security of miners and the sites, and means the customer can rapidly deploy video surveillance where and when needed. RADWIN adds that the use of its systems offer the lowest TCO as more high resolution cameras can be connected without the need to add extra radios.

As well as meeting all the manganese mining company's stringent technical and performance requirements, RADWIN claims its wireless links have improved visibility of field mining operations.

RADWIN's radios were also called into action in another mining deployment in South Africa, this time for a company that was looking to establish a network at its gold mine.

The chosen wireless solution had to be able to transmit video in real-time from cameras located at multiple locations, enable mining personnel to monitor activity around the clock from a command centre, and support voice, video and data applications that are crucial to safe and effective operations. What's more, the wireless network had to link surface infrastructure to underground systems, such as VoIP switches located 1,200 metres underground, for example.

According to RADWIN, wireless was the only relevant option for this type of deployment. It said use of fibre was unfeasible due to reliability and maintainability concerns. The mining site is a production shaft and any system placed in this type of harsh environment is subject to extreme abuse. An armoured fibre optical cable was therefore simply too costly to install and maintain.

After assessing equipment from different vendors, the unnamed gold mining company chose the vendor's *2000* PtP radio which offers support for voice, video and data services on a single platform. RADWIN says its system was also chosen for its high throughput, "superior" video quality transmission in challenging conditions, and IP6 certification.

The vendor adds that by using the *2000*, the gold mining company was able to overcome challenges posed by multipath and fresnel zone limitations imposed by the moving skips and cages and the physical dimensions of the mining shaft.

Vivo Energy simplifies payments with *M-PESA*

Shell has had a recognisable presence in Kenya for more than a hundred years. Today, Vivo Energy operates using the Shell brand at its nationwide petrol stations, and is said to be one of the country's most popular fuel and lubricant suppliers. The company has an extensive network including major bulk oil storage terminals, aviation services, and a lubricants blending plant in Mombasa, enabling it to serve multiple retail and commercial market segments.

For years, cash has been the most common method of payment for goods and services but, as has been well documented, it is not without its challenges. It is inherently insecure, the cost of handling and accurately recording physical transactions is a burden on retailers, as is ensuring its security in-store as well as in transit.

"Customers no longer want to carry cash with them at all times and would prefer a cashless alternative," says Samuel Mbugua, retail sales card manager, Vivo Energy. "We wanted to find a flexible, secure method of transaction that would be available to all our customers."

Vivo Energy said its customers no longer want to carry cash and prefer to pay for goods at its petrol stations using a cashless alternative.

While many people might not have access to financial facilities, the vast majority do carry a mobile phone. This presented one possible opportunity to introduce a more convenient payment method.

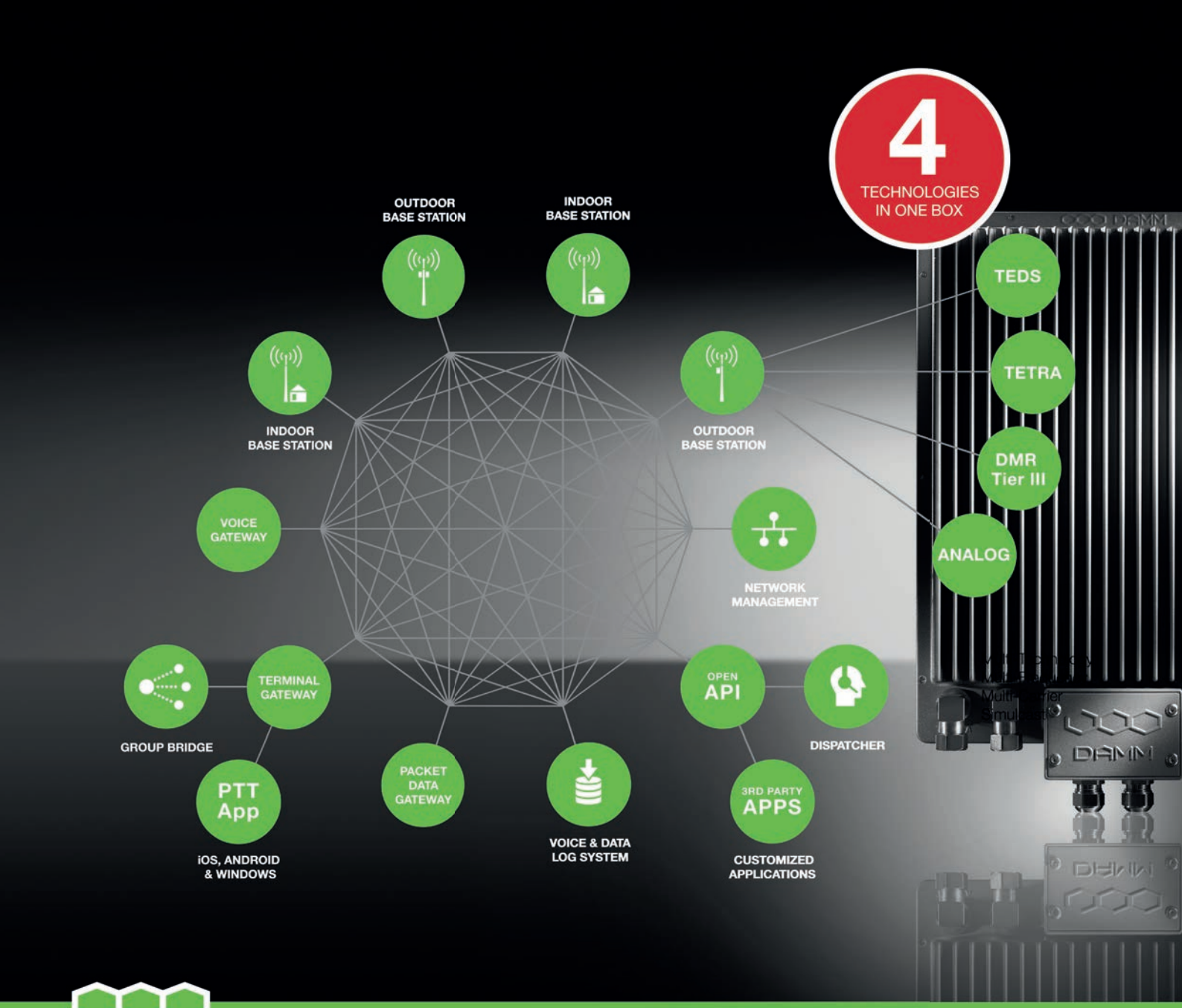
According to figures for the second quarter of the 2016-17 financial year published by the Communications Authority of Kenya late last year, the country saw 456.6 million mobile money transactions valued at KES586.4m (USD5.67m). More than 31 million mobile money subscribers were recorded for the period.

"We studied the consumer trends and looked into mobile wallets. It became clear that *M-PESA* was the market leader," says Mbugua.

Safaricom was responsible for rolling out *M-PESA* at the point of sale in 117 initial outlets for Vivo Energy. That number has since grown to 160. The mobile operator provided onsite installation and training to ensure Vivo's employees could use the system. Customers can now transact securely using *M-PESA* by entering a six digit shortcode to identify the outlet and their PIN to confirm the transaction. Both parties receive an SMS confirming the amount that has been transferred. Pre-paid Shell card holders can also conveniently top up their cards using *M-PESA*.

Deploying the mobile money system led to a number of immediate benefits for Vivo. Reducing in-store cash handling minimises the risk of robbery and makes the transaction process more efficient. It is also much simpler for customers who know they can pay easily without cash.

In addition, *M-PESA* introduces more accurate accounting which makes for increased operational efficiency. "It makes our job easier and means that all transactions can be precisely monitored so we run more effectively," says Mbugua. "At the same time, the customer experience is improved so our income grows. That's why we are looking at rolling out *M-PESA* to other countries." ■



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Up in the air

The entire communication sector is evolving and user expectations are changing. DAVID HARTSHORN of the Global VSAT Forum explains how the satellite industry needs to adapt.

Will the perception that the price of satellite capacity is high ever go away? Go to any industry event dedicated to satellite technology and the issue continues to come up in some form. So is that a key concern for the Global VSAT Forum (GVF) which was setup in 1997 as the "single and unified voice" of the worldwide satcoms industry? David Hartshorn – who has been the forum's permanent secretary general since the very beginning – points out that not only is the technology changing, but the way different communications industries work together or compete against each other is also changing.

"The satellite industry is part of all that. The traditional way that the entire value chain, right down to the end customer, has viewed bandwidth is central to the change that is currently underway in the satellite industry globally."

Hartshorn says capacity costs have historically been viewed in the industry in terms of price per megahertz. He believes this stems from the traditional business model of satellite operators running a wholesale business selling bandwidth. "But now there is high throughput satellite [HTS], new technologies on the ground as well as in other variables in play, where everyone is thinking not in terms of price per megahertz but rather price per megabit.

"And on top of that, is the layering of new managed services that are of value to the customer, such as cyber security, for example. So portfolios are being redrawn, and the price per megabit change is all coming from that.

"At the same time, you see satellite operators moving down the value chain looking for new ways to not only add value but to retain margin. There is so much capacity now that has become commoditised that they can't realise the type of margins they have grown accustomed to over the last few decades. So this is a fundamental change to the industry."

Hartshorn says there are also other elements of that change, such as traditional VSAT operators now adding non-satellite type connectivity solutions into the mix of the services they provide. He says while that has been going on in various ways for some time, it is now happening in the context of that "redrawing" of the value chain and the business models at each stage of that value chain – even to the extent of re-thinking what the end customer's role is. "We had a task force meeting where we had a customer from the cruise line industry. Two years from now, their current bandwidth contract will come to an end and they are looking at every possible model to see what would make the most sense. And one model involves them actually becoming an owner of satellite capacity – not leasing but owning – and where the end user becomes a [virtual] operator.

"This is been playing out worldwide and the disruption has been evident in Africa for more than five years. It has been playing out there at a significant level – the redrawing of relationships, business models, positions in the value chain, portfolios – all of that is in the process of evolving in Africa right now."

How has Hartshorn seen technology play its part in helping to reduce capacity prices? "In Africa, for example, we saw a period where there was an under-supply and demand was starving, and prices went up to USD8,000 per megahertz, up from USD2,000-3,000 just a year or two before that. And now, fundamentally new types of satellites have already launched with high

throughput coverage over Africa that has driven the prices down into the hundreds of dollars. There's more of that capacity coming, and the satellite operators who own that capacity recognise that they cannot simply be wholesalers any more."

The fibre question

Looking at the recent history of satellite in Africa, Hartshorn says there was a long period characterised by the technology being used largely for point-to-point connectivity because there was no fibre. "And then five or six years ago, fibre starts washing up on Africa's shores, and all the African satellite communication customers and users said 'hooray! We can get this high-cost satellite off of our roof and go to fibre and get on with our lives!'. So they thought fibre was going to solve all their problems."

Hartshorn and his team then spent the next two years going across the continent to explain why that would not prove to be the case. "We had seen all this before in South America in the 1990s; there was no fibre there and an entire industry had been built around using satellite to do fibre's job. Why? It was because that was what was demanded and it was good money. While satellite can't match the functionality of fibre you can get, for example, from Rio de Janeiro to São Paulo with no fibre. Banks, oil companies and various other enterprise interests were using VSAT to do trunk route type point-to-point connectivity between offices.

"But then fibre comes in and bam! Gone! And the local satellite industry said the sky is falling. Some of them went out of business because they did not adapt their business plan to reflect point-to-multipoint service provision, others through mergers and acquisitions, etc. So for two years, we tromped all over Africa to explain that satellite is inherently at its best in a point-to-multipoint solution. Africa understands satellite as only a point-to-point tool; it can do that, but fibre is better at it. However, put satellite and fibre together and now you've got end-to-end service.

"We marched around Africa preaching this. We had Orange in one of our seminars and I said to them 'you're technology neutral, right? As you deploy fibre in your business do you deploy more or less satellite?' And they said the more fibre we deploy, the more satellite we deploy. Why? Because it is two tools doing different things to get towards the same objective which is end-to-end connectivity."

According to Hartshorn, things have "shaken out" since the initial rollouts of fibre in Africa. He says service providers and users are now starting to realise that in order to continue growing, they need to have point-to-multipoint connectivity off the end of a point-to-point fibre link so that they can add more subscribers or extend reach for existing customers.

Some of the bigger names in the satcoms industry, such as Gilat Satellite[1], Hughes Network Systems[2] and Intelsat[3] have said that satellite is usually the option to use when there's no fibre alternative. Hartshorn clearly rejects this. "They can say what they want but they're wrong. You have two basic categories of customers. Firstly, there are those using satellite because there is nothing else (and satellite is good in those places, but not in every case – if it was, the world would be completely connected by now). Secondly, there are those who use satellite when there are other things but they're not optimised to do a certain task in the way that satellite inherently is. Most of the world's use of satellite communications is the latter, not the former.

"There is a huge misconception, not just in Africa but in the developing world generally, to say satellite is what you use when there is nothing else. That actually feeds into errant decisions that get made at the national policy-making level where they have the draft national broadband plan on the table and satellite barely gets any mention.

"In some cases with these national broadband plans, they are going hunting for elephants with BB guns and hunting for sparrows with elephant guns. I say this because we have come around, sometimes very late in the game, and found that the plan does not take any account of the possible use of satellite which is an indispensable complement to other tools to bridge the digital divide."

Spectrum: the defence continues

While the GVF does work closely with governments on such issues, Hartshorn says the last few years have seen the forum's energies consumed by a higher priority challenge: spectrum defence[4]. And it's not over yet.

"What is happening right now is what was happening after the World Radiocommunication Conference [WRC] in 2007. That was when the wireless industry made its first big push to go after a portion of the satellite industry's spectrum. At that time, it was very limited range, 34MHz to 36MHz ('extended' C-band) and they tried to get what is called a global identification of that portion of the band for use by wireless. They did not achieve that in 2007.

"Fast forward to November 2015 and the wireless industry came back in another wave. This time, it was not going after 34 to 36, but the entire C-band range, 34 to 42, and trying to get all of the satellite upper bands on the table for consideration. So after a two-year campaign at WRC 15 we were successful in preventing the wireless industry from getting a global identification for any portion of C-band."

During the run up to WRC 15, key organisations that led the wireless industry's case, such as the GSM Association, argued that co-existence between International Mobile Telecommunications and C-band frequencies was possible. Why did the satellite community remain unconvinced?

"They said that in 2006, even at the same time when wireless services were rolling out at 34 and 36. And in places like Malaysia, Indonesia, Tanzania and other countries, the interference was so bad that it was bringing incumbent satellite services down. There's no technology fix.

David Hartshorn, Secretary general, Global VSAT Forum

"For two years, we tromped all over Africa to explain that satellite is inherently at its best in a point-to-multipoint solution. Africa understands satellite as only a point-to-point tool."

"And so now the regulator is faced with an angry incumbent FSS provider, and an angry wireless operator who has already begun investing in deployment of the systems and who now has angry customers. In some of these cases, the regulator is forced to ask the licensed wireless operator to exit the band. That is not a conversation that any regulatory authority wants to have. But in other cases, some authorities perhaps did not have the maturity to stand up to a very powerful wireless operation. And so they just kept going along in an environment where you have polluted signals in the country – you don't want that either.

"Today, it's claimed sharing is still no problem because assurances are being given that wireless can co-exist within satellite bands without introducing interference, not only in C-band but in the upper bands as well. So nothing has really changed, except that the wireless industry is going after more spectrum."

According to Hartshorn, the wireless industry is now pushing for access to, among other bands, Ka-band, even though it was decided at WRC 15 that Ka is off the table for WRC 19. So is all this now going to consume most of Hartshorn's time during the coming years?

"Probably, the rest of my career – unless someone figures out a way of doing efficient spectrum sharing. If you can show me that innovation, I will be the first to invest because it is going to make a lot of money." ■

[1] Eran Yoran, Gilat Satcom, 'Setting new sights on backhaul', *Southern African Wireless Communications* Nov-Dec 2015 issue, p25.

[2] Dave Rehbehn, Hughes Network Systems, *African Wireless Communications Yearbook 2016*, p96.

[3] Jean-Philippe Gillet, Intelsat, ibid. p68.

[4] Martin Jarrold, GVF, 'Spectrum defence', *African Wireless Communications Yearbook 2015*, p67.

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Vodacom demos LTE critical comms

Applications such as real-time video can be supported on existing consumer smartphones and rugged LTE devices.

Vodacom says it has successfully demonstrated the first broadband multimedia trunking solution for critical comms users on a commercial LTE network in Africa.

It used Huawei's *LTE integrated Trunked Radio Application (LiTRA)* to demo the solution which ran on its commercial network in South Africa.

Vodacom says traditional private mobile radio network technologies (such as TETRA) mainly provide basic voice trunking services such as PTT and cannot support new, innovative, high-speed data services such as video and multimedia services.

"These traditional PMR networks are expensive to construct and maintain, the user terminals are expensive and have limited variety, and the network technology is often proprietary and inflexible," says the cellco.

The firm believes these issues can be overcome by using a broadband public trunking communications system such as the one it demonstrated. It says *LiTRA* overcomes the challenges of using a public LTE network for critical communication by prioritising emergency comms with a higher QoS and also ensures encryption and security of these messages.

Vodacom says *LiTRA* enables its entire LTE network to be leveraged to provide high bandwidth and low latency trunking capabilities to improve the performance of existing mission and business critical services such as PTT.

More importantly, the operator says it can also support new broadband multimedia trunking services such as push to video, real-time video surveillance, high resolution photos and location based services. It adds that the solution it demonstrated was fully compliant with 3GPP standards.

Hidden PIM source found in mobile connections

Researchers have found that humidity makes a significant contribution to passive intermodulation (PIM).

Working in partnership with the London Southbank University, in the UK, Hughes Electronics has been investigating and mitigating sources of PIM in cellular networks. In the latest research, its team has discovered that humidity deposits a layer of salts and other airborne contaminants which interfere with 'clean' signal transit.

Though almost impossible to see, researchers say the salts deposited during the evaporation process are electrically conductive and "play havoc" with skin effect signal transmission. They instigate surrogate (signal) pathways, causing parallel path and harmonic signals and distortions, which are a root cause of PIM.

To counter the effect, Hughes has come up with an IP68 rated cap which is designed to protect open connector interfaces from mechanical damage, dust and humidity.

The transparent cap incorporates a blue indicator that turns pink when it detects the presence of humidity. Hughes says it is possible to determine the amount of humidity present by the shade of colour.

It adds that no special tools are required to fit the rugged and lightweight screw on caps which are available for industry standard 7/16 and 4.3/10 connectors.

Network services to help solve Asia's unique issues

Telkom Indonesia and Japan's Nippon Telegraph and Telephone Corporation (NTT) plan to create new network services in Asia-Pacific based on virtual infrastructure technologies.

Under the *APAC Telecom Innovation Initiative (ATII)*, the two companies will develop technical studies and proof of concepts (PoCs) regarding requirements for new network services in the virtualisation era going beyond 2020. They aim to expand the initiative together with various partners, including other service providers, who share the same goals.

According to two telcos, service providers in APAC currently face several common issues such as sustainability due to natural disasters (for example, earthquakes and typhoons), and unique traffic demands due to uneven population distributions such as those across the region's island nations.

ATII will propose new services and technologies for the region. Three projects have initially been established: high value-added network services; server platform virtualisation; and flexible access network virtualisation.

The operators will now start their joint technical studies and plan to publish white papers on the identified needs, specifications and PoC results. They will also share their findings with all relevant standards bodies and industry alliances.

NATO ushers in "new era" of digital underwater comms

NATO has established the first underwater digital communications standard.

Because none of the available protocols for aerial and terrestrial communications could be easily exported under the sea, the organisation sponsored research into a new platform to work with and enhance the capabilities of game-changing robotic technologies.

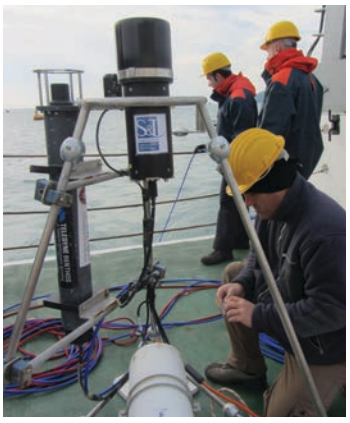
The result is JANUS, the first digital standard for underwater acoustic communications now recognised by all NATO members.

Developed by NATO's Italy-based STO CMRE (Science and Technology Organisation – Centre for Maritime Research and Experimentation), JANUS has been 10 years in the making. It is a way of encoding information into sound simple enough that existing and new equipment can be brought into compliance with the standard relatively easily.

Over the last few years, CMRE has been testing the standard on board the NATO research vessel *Alliance* and using its Littoral Ocean Observatory Network (LOON). The latter has been developed to facilitate the experimentation of marine robots' mission-base teams. It does this by creating a monitoring acoustic network using tripods of underwater comms equipment, such as Teledyne Benthos' transponders, that sit on the seabed. The network can then be accessed via the web.

Since its inception, it's claimed that the JANUS developing process has been as inclusive as possible, involving academia, industry, governmental agencies, and international subject matter experts. As a result, the protocol is said to work like a *lingua franca* and can make military and civilian, NATO and non-NATO devices fully interoperable.

The organisation adds that JANUS now opens the way for a standardised "Internet of Underwater Things".



Researchers on board the *Alliance* deploy a tripod used for the Littoral Ocean Observatory Network.

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Plug 'n' play mobile network

SES has launched what's claimed to be the world's first mobile platform to offer collaborative satcoms technologies over multiple orbits and frequencies.

The *Rapid Response Vehicle (RRV)* is designed to provide high-speed connectivity and global comms services tailored to commercial, civil, humanitarian and defence missions around the world. It supports Ku-, Ka- and military X- and Ka-bands across SES' GEO fleet, as well as the MEO satellites run by its subsidiary O3b.

The *RRV*'s wireless capabilities include MIMO SDR technology which help provide a mobile platform for private 3G/LTE networks and government PTT frequencies.

SES says the solution offers 'plug-and-play' versatility, and has modular features that can integrate a wide range of communication technologies and devices.

The company reckons the *RRV* can "easily adapt" with connectivity customised for specific scenarios and applications, such as HD video conferencing, streaming, voice, GSM backhaul, high-speed broadband, and large data file transfers in locations where infrastructure is non-existent or destroyed.

The vehicle can also quickly launch a number of other platforms, including the *SATMED* telemedicine service.

Mobitel launches first Sri Lankan 'Smart Bus Halt'

Mobitel reckons it has taken a "pioneering" step forward towards transforming Colombo into a smart city with what it describes as a "state-of-the-art Smart Bus Halt".

Situated at the town hall, the bus stop is equipped with LTE and Wi-Fi to deliver what the operator says is "superior" service quality and an "exceptional" customer experience.

For example, it features an interactive touchscreen with integrated facial analytics. This supports the ability to customise on-screen content to suit the audience based on a multitude of characteristics such as age and gender. It also doubles as a self-service information portal with details about bus and train routes, timetables, local ATMs, etc.

The bus halt is also equipped with environment sensors which monitor a variety of factors such as temperature, humidity, noise level and toxic gas concentrations. Mobitel says data gathered from these sensors will enable the monitoring of air quality on a routine basis.

The innovative bus stop features a smart vending machine, smart interactive displays, and wireless sensors to monitor the environment.

Among the many other facilities accessible to commuters, the site will be equipped with a mobile charging station. There's also a cashless vending machine which can dispense beverages with a touch of a mobile. For a limited period, the machine gave Mobitel customers a free bottle of chilled water following a simple SMS command.

Working with Sri Lanka's Ministry of Telecommunication and Digital Infrastructure, Mobitel says the Smart Bus Halt is the first step in a large-scale deployment of similar ventures both in Colombo and across the island.

World's fastest 5G speed for connected car

SK Telecom (SKT) says it achieved a peak rate of 3.6Gbps for a connected vehicle travelling at a speed of 170 kph during a demonstration carried out in February.

The demo took place with Ericsson at BMW Korea's driving centre in Yeongjong Island, Incheon. This is where the three companies say they have deployed the world largest mmWave 5G trial network using the 28GHz band. According to SKT, millimetre waves in these bands use a high gain and high directivity antenna which often causes signals to be blocked by objects standing in their path. They also have smaller coverage. Through the application of its advanced beamforming and beam tracking technologies, the operator claims it was able to address these limitations.

It adds that the 3.6Gbps data rate realised in the demo "significantly" enhances the stability of connected car services by improving image recognition and V2X (vehicle to everything communication) technologies.

As a result, vehicles will be able to communicate in real-time with each other as well as with traffic lights and surveillance cameras. They will be able to understand and respond to unexpected situations and obstacles, and remain within the lane in a much shorter time.

Moreover, the partners expect mmWave's ultra-high transmission speed to have a major impact on all 5G use cases including augmented and virtual realities, robotics, drones and autonomous driving.

BT introduces the "phonebox of the future"

Residents, visitors and businesses in the London borough of Southwark are set to benefit from the fastest free public Wi-Fi available, free calls, and a range of other free digital services on the street, following a partnership between BT, Intersection, and outdoor advertising company Primesight.

Southwark is home to a number of the UK capital's most iconic tourist attractions, such as Tower Bridge, the Shard skyscraper, Tate Modern art gallery, amongst many others.

The sleek looking *Links* kiosks will be installed on high streets across the borough and will take up less space than the payphones they replace. BT says hundreds of users within their range will be able to access free ultrafast Wi-Fi on the move, with speeds of up to 1Gbps. Other free services will include UK landline and mobile calls, rapid mobile device charging, online maps, directions and local information.

The telco says all these services will come at no cost to users or taxpayers as they will be funded by revenues from advertising on the *Links*' digital displays. Each kiosk will feature two 55-inch HD screens that can show public service announcements as well as advertising for businesses.

They will also feature sensors that can capture real-time data relating to the local environment. This could include, for example, air and noise pollution, outdoor temperature and traffic conditions. BT says this offers the potential of introducing a new range of IoT smart services to local councils and communities .

At least 750 *Links* kiosks are expected to be installed across central London and in major cities across the UK over the next few years. More than 100 will be installed in Southwark, with the first ones due to appear later in 2017.

At least 750 *Links* kiosks will be installed across UK cities over the next few years.

Intracom in Italy

EOLO will use Intracom Telecom's point-to-multipoint (PtMP) *WiBAS-Connect* system across rural Italy. Under a government contract, the operator will connect several hundred thousand subscribers with the ultra-broadband wireless network that will include equipment operating in the 28GHz band. The PtMP deployment will enable EOLO to improve its coverage to 13 regions and 70 provinces and offer speeds of up to 100Mbps. It plans to complete the rollout within five years and be the first to offer 5G speeds in Italy.

Motorola ICaaS launch

Motorola Solutions has introduced Intelligent Communications as a Service to help Caribbean first responders. It says the service model gives users access to public safety mobile applications as a recurrent subscription for easy deployment without the need to invest in servers and data centres. The package includes apps such as: messaging; mapping; whiteboarding (for collaboration and information-sharing in the field); and secure, encrypted telephony. There's also *WAVE*, Motorola's secure PTT solution for smartphone users.

ZTE smart parking

ZTE has unveiled a narrow band Internet-of-things (NB-IoT) smart parking system. It uses technology to detect changes in the magnetic field and judge whether a parking spot is occupied. ZTE claims its precision is higher than 99 per cent. Drivers can use the accompanying mobile app to search for a parking space in real-time, reserve it, and then be quickly guided to the vacant spot. The system is currently being commercially trialled in Shenzhen and Nanjing, and is scheduled to be used in more cities worldwide.

The art of the IoT

Xirrus provided the wireless hardware and software infrastructure for an innovative art installation in Canary Wharf, part of London's financial district.

Created by digital art group Squidsoup, *Bloom* comprises around one thousand individual Wi-Fi-enabled IoT light bulbs that sway in the wind and spread a gentle glow each evening. Each light contains a GPS chip, accelerometer and speakers. These combine to create what's described as "a digital symphony" of light and sound set against a backdrop of iconic or historic landscapes.

Squidsoup says the combination of Xirrus Wi-Fi, GPS technology and IoT intelligence in each light makes every bulb location-aware. It says this allows them to receive commands from a central digital hub, while bringing subtle choreography and control to the whole installation. Xirrus' Wi-Fi network enables each light to communicate over the network.

Among the challenges faced by Bloom's designers was the pressure of maintaining a strong and resilient Wi-Fi signal. They needed a single wireless network with the capability to reliably connect more than a thousand IoT devices across an open outdoor space, while also providing the consistency needed to ensure a stunning display each evening.

The installation also required a management system that could centrally control each Wi-Fi device and fully-utilise the IoT technology present in each node.

PHOTO: © CANARY WHARF

Top: featuring around 1,000 light bulbs, *Bloom* was on display at Canary Wharf. Bottom: each bulb is equipped with Wi-Fi, GPS and IoT intelligence which makes it location-aware.

Following its launch in London, *Bloom* is now expected to make its international debut in Mexico City during mid-2017.

World's first LAA ready commercial network

Huawei, Vodafone and Qualcomm Technologies have worked together on a project to create what they say is the world's first network ready to use License Assisted Access (LAA) technology.

Based on the 3GPP R13 standard, the network was tested using a Huawei *Lampsite* base station in Vodafone Turkey's Arena Store in Istanbul. It used 40MHz of unlicensed spectrum in 5GHz, and 15MHz licensed spectrum in 2.6GHz for three carrier aggregation. The on-site peak download speed of 370Mbps was achieved using Qualcomm's *Snapdragon 835* processor with an *X16* LTE mobile test device.

It's claimed the test showed that LAA's spectral efficiency is higher than Wi-Fi when using the same 40MHz of spectrum. The companies say it also showed that an LAA network can fairly co-exist with Wi-Fi by supporting the 3GPP R13 standard for 'listen before talk' technology.

Santiago Tenorio, head of networks for Vodafone Group, says: "The LAA network fully reuses the existing core, network management system and accounting system we use for 4G, and so will effectively improve our return on investment."

According to the partners, the introduction of LAA on mobile networks will help improve the user experience by enabling faster download speeds.

They believe this will help consumers enjoy a more immersive experience when, for example, using VR or AR apps. Smartphones with support for LAA are expected later this year.

Wi-Fi camera aims to make cycling safer

A crowdfunded startup company is aiming to enhance the safety of cyclists with the world's first Wi-Fi rear view camera.

HEXAGON has been developed by US-based Smart Bike Systems. Available later this year, the detachable full HD rear-facing camera uses Wi-Fi to "seamlessly" connect with the rider's smartphone which can be attached to the handlebars using a mounting accessory.

The camera enables cyclists to view the road behind them on their smartphones as well as stream their ride live on the web using an app. The device also features automatic stop, turn and motion signals. The entry-level *HEXAGON* comes with a wireless remote that securely attaches to the handlebars to support this feature.

The rear-facing camera enables users to view the road behind them and includes other safety features such as automatic stop, turn and motion signals, and more.

Smart Bike says it uses a 2.5GHz Wi-Fi Direct connection rather than Bluetooth as it is more stable, reliable and faster, and therefore better for transferring video.

Other features include a power bank, activity tracker, odometer and crash sensor. The latter can detect a crash and automatically sends an SMS to designated emergency contacts in the user's smartphone.

In addition, the *iOS* and *Android* compatible app has an activity tracker, navigation system, and more. Parents can also monitor their child's biking activity via the app and receive an SOS message in the event of an accident.

The IP65 rated weather and dustproof *HEXAGON* comes with two batteries that can be recharged with the supplied micro USB cable.

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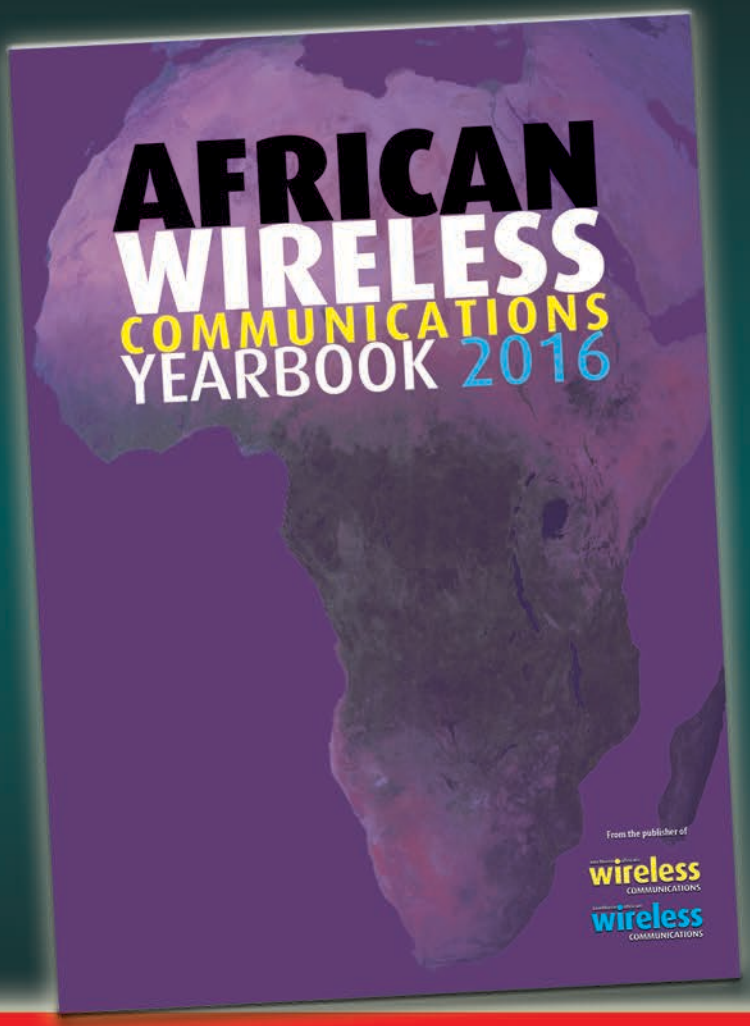

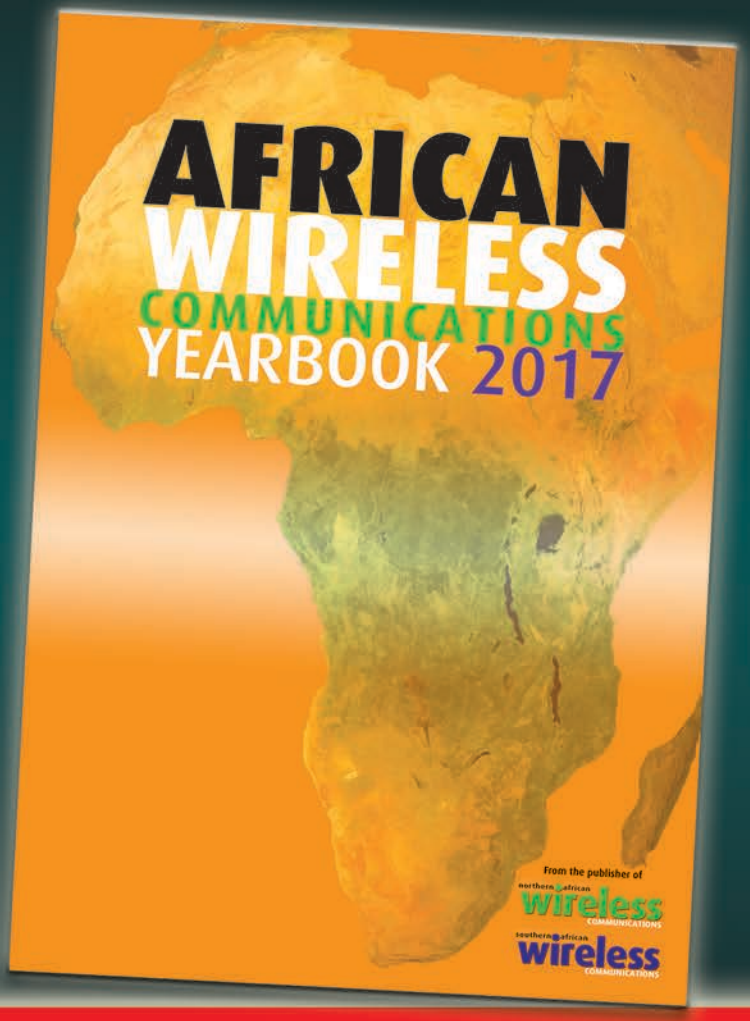

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