- **What next for VAS after mobile money?**
- **RF technology: the key to smart city applications**
- **How to avoid a 'dim' network and boost QoE**

CONTENTS

KADIUM

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.

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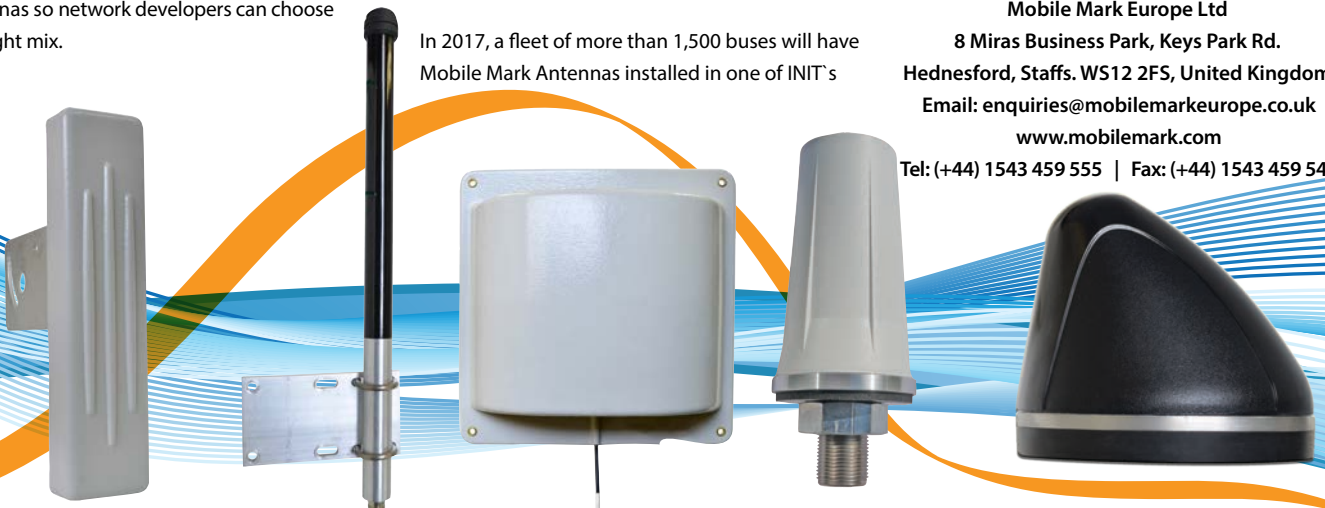
We understand the RF wireless world and are ready to help you evaluate your options. Contact us by email, phone or fax and let us know how we can help.

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Quika plans to launch world's first free satellite internet service

A new company has been set up to launch what's promised to be the world's first entirely free high-speed satellite internet for consumers in developing countries.

London-based Quika was founded by Alan Afrasiab, the CEO and president of global satellite networks and services provider, Talia Group.

Speaking during the launch of Quika in January, Afrasiab said: "We believe that left unbalanced, entire communities and regions will be abandoned by technological and economic progress. Quika will help bridge this digital and economic divide.

"The main reasons for people not using the internet are inequalities in relation to income and education, as well as the lack of infrastructure, relevant online content and services, plus relatively high costs of access and usage."

Quika's free service will be partially funded by advertising and through the subsidisation of the paid version which will be available on a pay monthly basis or via pre-paid plans. Prices have yet to be announced.

Paid services will include a variety of bandwidths designed for SMEs and local ISPs, and offer download speeds of 5-50Mbps and upload speeds of 1-3Mbps depending on the plan chosen. The free version will have

Quika believes that the opportunities the internet provides shouldn't be limited by geography, culture, wealth or infrastructure. It will use GEO and LEO satellites to provide Ka-band services for free.

fixed bandwidth offering download/upload speeds of 3Mbps/1Mbps.

Quika will use high throughput Ka-band satellites. It said that while data speeds will be fast, internet services provided by geostationary satellites mean an average latency of 638ms. This will make Quika unsuitable for applications such as online gaming or screen sharing. However in the future, the firm aims to utilise low-Earth orbit satellites that promise to reduce latency to under 100ms.

In the meantime, Quika has partnered with Isotropic Systems to develop a self-installing terminal to help bring broadband to consumers at no cost.

With offices in the UK and USA, Isotropic Systems is developing a terminal to support the satellite industry to 'reach beyond' traditional markets. It claims the fully integrated high throughput terminal will be the first to offer multi-service, high-bandwidth and low power.

The two companies said they will jointly develop an "out-of-the-box consumer web experience" that eliminates the need for skilled installation, and allows internet usage to be fully subsidised by advertising.

Isotropic said its optical technology will enable terminals that meet or exceed traditional VSATs at one-tenth

the current cost. It claims that the technology mitigates several key engineering challenges to deliver "seamless auto tracking, unlimited instantaneous bandwidth through true time delay, and a 90 per cent reduction in power consumption over conventional design". According to Isotropic, its technology automatically tunes the beam-pointing to maintain the precise accuracy over time that is uniquely needed for Ka-band systems to optimise the efficiency of the links in the service provider's network.

In a separate deal, Avanti Communications is also working with Isotropic to develop a self-installing terminal to expand its markets in Africa, the Middle East and Europe. A working prototype is expected in early 2019 and full scale production by mid 2020.

Quika will initially launch its internet services in Afghanistan and Iraq at the end of Q318 before launching in 27 countries in Africa at the end of the year. In the region of the continent they include: Algeria, Benin, Cameroon, Congo Republic, Côte d'Ivoire, DRC, Egypt, Ghana, Libya, Nigeria, Rwanda, Senegal, South Sudan, Togo and Tunisia. However, the company points out that its ultimate vision is to offer free broadband services globally.

Unique 'power and coverage as a service' in Rwanda

Canada-based off-grid power specialist Clear Blue Technologies is helping Vanu to provide cellular coverage that will support up to a million customers in rural Rwanda.

Vanu grew out of what's described as "groundbreaking" research in software radio at the Massachusetts Institute of Technology. The company has since pioneered a wireless communications solution and a 'coverage-as-a-service' business model that is claimed to make it economically viable to provide telecom services to remote areas.

Clear Blue's *Smart Off-Grid* solution and service will provide the accompanying 'power as a service' to deliver reliable,

Clear Blue's 'power as a service' will provide reliable, wireless, clean managed power for Vanu's base station.

wireless, clean managed power for the Vanu cellular base station. The company's system includes

a hybrid controller, integrated communications network and the *Illumience* cloud software for full

remote control and management over the internet. It claims all this "slashes" maintenance time and costs by up to 80 per cent.

"Clear Blue's *Smart Off-Grid* system enables us to install our communications solutions in areas without grid power or skilled labour for ongoing system maintenance," says Vanu Group CEO Andy Beard. "This assists in our objective to lower the cost per cell site to a level that permits sustainable service in sparsely populated areas."

Beard says Vanu's aim is to help MNOs extend coverage to rural communities in Rwanda, and that by working with Clear Blue in the future, it will roll out rural market solutions for operators worldwide.

World's first CloudAIR trial is completed on live network in Egypt

Huawei says it has completed the world's first verification of its *CloudAIR GL15MHz* spectrum sharing solution on Etisalat Misr's network in Cairo.

Since launching 4G services in Egypt in 2016, Etisalat now has 3.4 million LTE subscribers. As users increasingly migrate to LTE, Huawei says effective allocation of spectrum resources to handle growing data traffic has become a priority for the operator.

According to the vendor, its *CloudAIR GL15MHz* system accelerates the full convergence of multi-band and multi-RAT networks, increasing both LTE data rate and cell capacity

available at 1800MHz. It claims the platform enables dynamic spectrum sharing between GSM and LTE with "unprecedented" overlap between the two technologies, and also promises a smooth transition to LTE as well as increasing spectral efficiency.

CloudAIR uses proprietary algorithms and is said to ensure that scattered spectrum resources are fully utilised to deliver higher data rates and better user experience. It does this by increasing flexibility in the resource block and spectrum allocation used by LTE. Compared to LTE 10MHz, Huawei says the system

Etisalat Misr CTO Khalid Murshed (left) and Huawei's wireless product line president Edward Deng (right) celebrate CloudAIR's commercial launch.
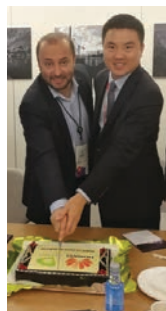
increases average user throughput by 20 per cent on downlink, while peak throughput reached 92Mbps. It adds that compared to GSM 5MHz and LTE 15MHz without the

CloudAIR feature, the GSM KPI remains stable without degradation.

"Spectrum allocation is static in the traditional refarming solution, which results sometimes in low utilisation rate" says Etisalat Misr CTO Khalid Murshed. "In comparison, *CloudAIR* supports more efficient spectrum sharing between GSM and LTE. That has helped to boost spectral efficiency and improve the overall experience of 4G users in Cairo."

Murshed adds that following the successful trial, Huawei's system will now be deployed on the operator's entire network in Egypt.

Ericsson to deploy next-generation NOC for Safaricom

Ericsson and HPE (Hewlett Packard Enterprise) will work together on what's described as a "next-generation" network operations centre for Safaricom.

The award represents the second phase of what Ericsson claims is the first-of-a kind multivendor OSS project that it has completed in sub-Saharan Africa.

The project is expected to further support Safaricom in

improving key aspects that will enable it to significantly improve network performance. The Kenyan operator hopes to gain greater visibility through improved management of network layers. Ericsson says this will give the operator a strong operational competitive advantage through real-time and rich OSS insights, coupled with the ability to efficiently act on those insights to

provide better services to its 29 million subscribers.

Safaricom's head of network and service operations Farouk Gaffoor says: "The Safaricom and Ericsson partnership for the first phase of our next-generation NOC created great value for us and our customers. This award is a testimony to the value of transformative partnerships and demonstrates our belief that when we come together, great things

happen for our customers."

Ericsson claims that the partnership represents one of the "most successful" initiatives from an operator and vendor that has "significantly improved" the performance or coverage of a network in Africa since the end of November 2016.

The Swedish vendor adds that its implementation for Safaricom is based on five pillars: views, process, people, infrastructure and tools.

Digital mobile radio helps protect Mara North Conservancy

Critical communications specialist Hytera has released details of a DMR (digital mobile radio) deployment it carried out at the Mara North Conservancy (MNC) in 2016.

MNC covers around 74,000 acres north of the Maasai Mara National Reserve, in the south western corner of Kenya. It needed a real-time communication system for daily missions to not only protect the wildlife environment but also ensure the safety of its rangers, tourists and local residents. MNC's prime requirements was for a system that offers clear voice, ruggedness and broad coverage.

Hytera recommended a DMR solution that features a number of its products. Working with Nairobi-based Seiya Limited which specialises in solutions for the Greater Mara Ecosystem, a network was built that features Hytera's
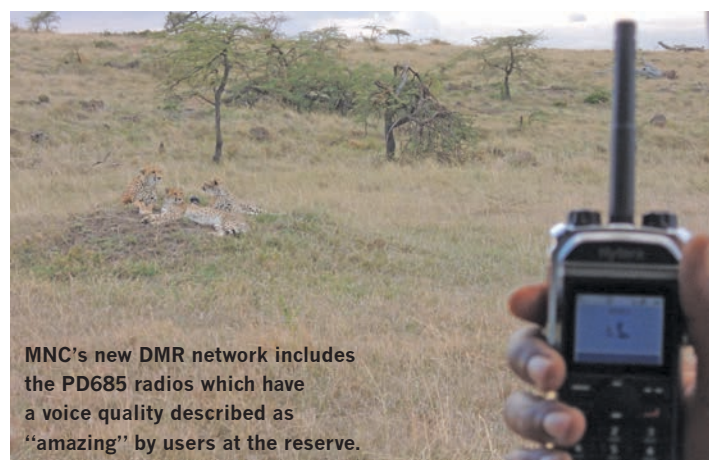
MNC's new DMR network includes the PD685 radios which have a voice quality described as "amazing" by users at the reserve.

RD985S repeater to provide large area coverage. This now supports instant communication among 34 rangers at MNC's headquarters and eight camps, as well as real-time patrol reports between the camps and headquarters.

Other Hytera equipment deployed included the *MD785G* mobile radio and the compact *PD685* handheld with built-in GPS. The latter is said to be compliant with MIL-STD-810 C/D/E/F/G standards, and is IP67 rated for dust and water resistance

up to a depth of one metre for 30 minutes. MNC is also using the vendor's smart dispatch system which supports visualisation management and dispatching operation, along with main functions such as voice dispatching, text messaging, GPS positioning, recording, etc.

Users have described the voice quality offered by the new digital radios as "amazing" and "clear and loud". Seiya manager Patrick Siparo added: "These have helped us immensely to make calls among our eight different stations spread out in the 70,000 acre area, even beyond our border."

MNC is also using the vendor's smart dispatch system which supports visualisation management and dispatching operation, along with main functions such as voice dispatching, text messaging, GPS positioning, recording, etc.

SatADSL connects radios and tourists

Catholic radio network RCBurkina is using SatADSL's IP connectivity solution to broadcast its services in Burkina Faso.

Often covering very large areas, SatADSL says broadcasters need to install multiple local repeaters to receive and regenerate signals and transmit their TV and radio programmes everywhere.

RCBurkina operates from a central radio station in Ouagadougou, and is equipped with a studio and a satellite terminal. It uses SatADSL's IP multicast technology to broadcast

Virunga National Park's hydropower plants are also used to bring electricity to local communities.

programmes to all 14 radios in its network, including some daily programmes that are broadcast live.

SatADSL claims its simple solution can be implemented in only a few weeks. It uses a standard satellite terminal with a parabolic one metre dish antenna connected to an MP3 stream decoder, with the analogue output reserved for the FM transmitter. The stream is then routed to a data centre in Brussels over a fibre or satellite link where SatADSL then broadcasts it via satellite.

The company adds that its multicast technology allows for simultaneous distribution to repeaters, regardless of the number of sites that need

to be covered. SatADSL claims this makes its solution much cheaper than other technologies including fibre.

In a separate deployment, Virunga National Park in eastern DRC is also using an IP connectivity solution provided by SatADSL. Founded in 1925 as Africa's first national park, Virunga covers 7,800km^2 and is now a designated UNESCO World Heritage Site. SatADSL's customised solution uses C-band capacity from Arabsat 5A to provide all tourists throughout the park with optimal internet connectivity.

Bentley Walker to expand in Africa with HYLAS

Bentley Walker is aiming to "significantly increase" its EMEA coverage with the help of Avanti.

The company has announced that it will start service roll out across Africa utilising its initial USD1m bandwidth commitment on Avanti's *HYLAS 4* which, at the time of writing, is due to be launched by Arianespace on 5 April 2018.

HYLAS 4 promises to expand capacity over Europe and sub-Saharan Africa with 64 active Ka-band fixed beams and four steerable beams. This will extend Avanti's coverage to 1.7 billion people across 118 countries, and support Bentley Walker's market expansion into West, Central and South Africa.

UK-based Bentley Walker is said to be the largest supplier and operator of VSAT networks outside of North America. According to an

independent audit, the company has so far sold and brought online more than 40,000 VSATs.

Bentley Walker has already been working closely with Avanti. Earlier, the company announced that its iDirect-based DVB-S2X service was now available in Afghanistan, Iraq and Libya. Utilising Avanti's Ka-band capacity, the firm says it can provide customers with a seamless upgrade path to utilise iDirect's *iQ* series family of modems for increased throughputs.

It is also adding new functionality including software that allows resellers the flexibility to activate, upgrade, downgrade, change and find location. Bentley Walker adds that customers will also have more access to multiple performance indicators to help in the management and delivery of more efficient operations.

Cobbett Hill to use AMOS-17 for next-gen services in SSA

Cobbett Hill Earthstation has entered into a long-term agreement for capacity on Spacecom's forthcoming *AMOS-17* communication satellite.

An independent teleport based in the UK, Cobbett Hill will use the spacecraft's C-band transponders to provide high throughput internet, voice, data and broadcast services to the growing communication markets in sub-Saharan Africa.

Cobbett Hill was one of Spacecom's first partners and the two companies have been working together now for more than 10 years.

"[*AMOS-17*'s] extensive range and superior power meet our needs for adding new services as we expand our next-gen service packages to existing and new clients," says Cobbett Hill MD Paul O'Brian.

Scheduled for launch during the second quarter of next year, *AMOS-17*

is specifically designed for meeting Africa's growing demands. With what it describes as "extensive" Ka-, Ku- and C-band services, Spacecom says its satellite will combine broad regional beams and high throughput spot beams to maximise service delivery and spectral efficiency from its 17°E orbital position.

Spacecom claims *AMOS-17* will be the "most technologically advanced" satellite to service Africa and will deliver a large variety of services from its "state-of-the-art" digital payload.

Ido Ginzburg, the company's VP sales North America, UK and Nordic, adds: "The satellite will connect Africa, Europe and the Middle East, creating a unique bridge for furthering a new digital age in sub-Sahara Africa in which satellite services will be at the centre."

Connectivity "revolutionised" for mining industry in DRC

Canadian mineral exploration and development company Ivanhoe Mines is working with SES Networks to provide reliable high-performance managed connectivity services for the Kamoa-Kakula Copper Project in the DRC

SES says it will provide managed services and "fibre-like" connectivity powered by its O3b medium Earth orbit satellite fleet. There are now 16 O3b satellites in space following the successful launch of four new birds from the company on 9 March 2018. Another quartet is scheduled to launch during the first half of next year.

SES claims the turnkey solution delivered via its "unique" infrastructure will enable the crew working at the Kamoa-Kakula site to leverage the latest applications, communicate effectively, and maximise their productivity. The company says operators on site will be able to video-conference with headquarters, use cloud-based applications to access and upload critical data, and improve overall productivity and safety.

Steve Amos, Ivanhoe's head of projects in the DRC, says: "We employ leading-edge exploration and

The Kamoa-Kakula mining project is said to be the world's largest undeveloped high-grade copper discovery.

development technologies at our projects, and to make sure that these technologies are applied successfully,

we need to get the right information to the right people at the right time."

The Kamoa-Kakula mining project is said to be the world's largest undeveloped high-grade copper discovery. Located about 270km away from the provincial capital of Lubumbashi, the mine exploration covers a near-surface stratiform copper deposit with adjacent exploration areas within the Central African Copperbelt.

The project is a joint venture between Ivanhoe Mines, Zijin Mining and the DRC government.

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Orange teams with OpenClassroom and CNED to boost digital skills

Orange is aiming to boost digital training and e-learning in Africa under two separate partnerships announced in February.

Several of the operator's 19 subsidiaries on the continent are already working on the launch of digital training centres providing online courses via OpenClassrooms, a web-based education platform in Europe that claims to be used by three million students around the world.

Students in Africa will have access to OpenClassrooms' courses via Orange's mobile network. The courses can be followed on a smartphone for subjects that don't require a computer (such as *Understanding*
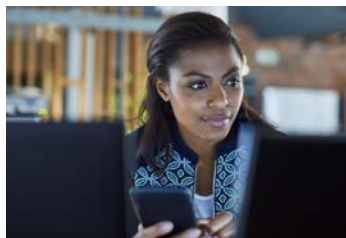
Orange and OpenClassrooms have combined forces to train young Africans in digital technology.
PHOTO: HOXTON RYAN LESS

the web, *The network*, *Big data*, *Bitcoin*, etc.), or on a computer with internet access via the user's smartphone for courses on programming, for example.

The centres will offer learning that leads to the OpenClassrooms diploma. This is said to offer guaranteed employment, with the help of local partners, whose premises will be used as training and examination centres. OpenClassrooms adds that if students don't find a job within six months of graduating, their tuition fees are fully refunded.

In a separate deal, the National Distance Learning Centre (CNED) has also teamed up with Orange to facilitate smartphone access to educational content on the continent.

CNED says more than 29,000 people globally are registered to use its distance learning service. It says it has a database of content covering primary, secondary and higher education, as well as vocational training.

The organisation will distribute its content in Africa using Orange's network footprint. The partnership is already active in the DRC and is currently being introduced to the company's other subsidiaries in the region. The content will be distributed in French in ebook format through the *MondoCNED* app that can be downloaded onto smartphones and can even be available offline. Other partners will also be able to offer their content to Orange customers.

Plan International upgrades VSAT systems with ITC Global

Satcoms specialist ITC Global has been awarded a three-year contract renewal by Plan International for service to multiple sites in Africa.

Plan International is a non-profit development and humanitarian organisation that aims to advance children's rights and equality for girls. ITC Global has been its communications provider on the continent for nearly 10 years.

The company will provide remote communications over the next three years to 24 Plan International sites across Western and Central Africa. Services will include a customised VSAT network in addition to a full upgrade of existing system electronics used by the 2.4 metre antennas that are already in place at each site.

The upgrades will be carried out by local field technicians who work with Plan International's team across the region. They will perform site visits for equipment replacement and general maintenance, enabled by ITC Global's local presence in Burkina Faso, Ghana, Guinea, Nigeria and DRC. The field electronics refresh is expected to be completed later this year, all while being backed by ITC Global's round-the-clock network monitoring and support for the entire contract lifecycle.

This latest contract follows ITC Global's recent deals with multiple NGOs covering connectivity needs for more than 80 sites across Africa and the Middle East.

Standard Chartered launches its first digital bank in Africa

Standard Chartered Bank has launched its first digital bank in Africa in Côte d'Ivoire.

By downloading Standard Chartered's app, new clients can use their mobile devices to open an account. It's claimed they can upload all verification documents and fully complete the onboarding process within 15 minutes.

"Our new digital bank was developed with our clients in mind," says Jaydeep Gupta, Standard Chartered's regional head of retail banking, Africa and Middle East. "We have taken into consideration the feedback received by our clients at each stage of the design process and have incorporated innovative technology to allow them to execute all banking activities from a mobile device. This includes 70 banking services through the app."

Gupta adds that clients will also be able to track and trace a request submitted – a first for Standard Chartered.

The bank launched the new service with the support of the Côte d'Ivoire government. Sunil Kaushal, Standard Chartered's regional CEO for Africa and Middle East, hailed the achievement as a "key milestone" on the company's digital journey, and that it underlines a commitment to investing and growing in the market.

"We have been steadily investing in expanding our footprint in Africa over the years, and this will continue to be a priority moving forward," says Kaushal. "Digitising Africa remains at the heart of our business strategy for the region, and we look to implement our Côte d'Ivoire model across other markets in the coming months."

As the bank's digital ambassador, international footballing legend Didier Drogba (centre) became the first person in Côte d'Ivoire to open a digital account. He is pictured with Sunil Kaushal, Standard Chartered's MEA CEO (left) and Côte d'Ivoire ICT minister, Bruno Nabagné Kone.

Marlink tracking service to help protect racers

Iritrack will be installed on nearly 200 competitor cars, trucks, buggies, motorbikes and quads.
PHOTO: MOROCCO DESERT CHALLENGE

The organisers of the annual Morocco Desert Challenge (MDC) rally-raid have signed a three-year deal with Marlink for tracking and race management services.

The satcoms specialist will deploy its new *Iritrack* tracking system which combines data handling and on-the-ground support in an effort to improve competitor safety and race management capabilities. According to Marlink, the satellite-based tracking and security system provides reliable two-way data and voice communications in a single device.

After the Dakar, the MDC has grown to be the second largest rally-raid in the world. *Iritrack* will be installed on nearly 200 competitor cars, trucks, buggies, motorbikes and quads for the tenth edition of the *MDC* which takes place over 14-22 April. It will also be used in subsequent races.

It's claimed the system offers a unique combination of tracking functions and safety sensors. These built-in sensors automatically inform race control when a vehicle is overturned or stationary due to an incident, supporting faster and more effective intervention.

Iritrack also features an integrated satellite phone. By simply pushing one button, participants can directly contact the emergency centre without first switching on a device and dialling a number, as with a traditional satphone. In addition, there are manual panic buttons configurable by the user that can be used in emergency situations or for identification.

Event organisers can also use the system to directly contact competitors, even when they are racing.

Marlink will deliver and manage the course technology infrastructure. This will include the *Iriviewer Software Suite*, a monitoring tool that manages the *Iritrack* network to provide accurate live locations and timings of all competitors in addition to deep analysis of the data received.

The company will also provide its team of field engineers to install and maintain the fleet of tracking devices, assist security staff in monitoring the race at the operational HQ, and deliver in-depth training for the organiser's own technicians.

Chafic Traboulsi, Head of Networks for Ericsson Middle East and Africa tells the story of 5G

■ **With the first 5G NR standard in place, what can we look forward to in terms of 5G development in the coming months?**

● The pace at which business use cases are being visualized, conceptualized, and constructed today is quite phenomenal. 5G use cases will include faster and more robust high-speed mobile broadband and video everywhere, a proliferation of connected sensors to support IoT implementation, and everything from driverless buses to remote surgery to immersive augmented reality.

● We can all agree that 5G is the future. It is estimated that by 2023, there will be more than 9.1 billion mobile subscriptions and 1.5 billion cellular IoT devices relying on mobile networks worldwide. In order to support this immense demand and the necessary speed of services, operators will continuously strive to improve capacity, quality and functionality of their networks at one end while looking at ubiquitous digital transformation initiatives to deliver innovative services and customer experience on the other end.

● In line with this pressing agenda, Ericsson is tirelessly working with partners and operators to address impending market realities. In a bid to augment the business potential of 5G, Ericsson has introduced the world's first 5G NR Radio – featuring 64 transmit and 64 receiving antennas enabling 5G plug-ins for both Massive MIMO and Multi-User MIMO. We've also added Gigabit LTE and Cloud RAN - new LTE software and hardware solutions that leverage key 5G technology concepts operators can deploy in today's network to improve both performance and efficiency while preparing for largescale 5G adoption.

● In the coming months, we will see more operators begin trials that will bring essential 5G technology concepts to existing cellular data networks.

■ **In your opinion, which use cases of 5G would be most popular in the MEA market?**

● Cellular IoT connections in the Middle East and Africa are expected to grow from 35 million in 2017 to 159 million in 2023 – a CAGR of around 30 percent. As the world becomes more connected, industries are experiencing an ICT-driven transformation, creating new revenue opportunities for ICT players. Cumulative revenue in the Middle East and Africa is predicted to reach USD 242billion through 2026.

● 5G will be an important technology in growing industrial digitalization, particularly for use cases dependent on ultra-low latency and high reliability. This presents an opportunity for service providers that are ready to explore revenue streams addressing B2B2X industry players.
○ Cumulative 5G enabled industry digitalization revenues for IoT in the Middle East and Africa in % Energy & Utilities: 19%
○ Manufacturing: 19%
○ Health Care: 13%
○ Public Safety: 12%
○ Public Transport: 9%
○ Media & Entertainment: 9%
○ Automotive: 8%
○ Financial Services : 6%
○ Retail: 4%
○ Agriculture: 1%

Even though IoT is still in its infancy throughout many parts of Middle East and Africa, there are still examples of how it has helped improve livelihood of communities and industries in the region. For instance:

● In Turkey, smart agriculture initiatives have been ongoing since 2011, and similar initiatives are now ongoing in parts of Africa.

● The Saudi Arabian market has been exploring remote monitoring of oil wells and making temporary networks available in cases of disasters.

● In South Africa, Narrowband IoT (NB-IoT) technology will serve the region's diverse needs, opening up new revenue streams as a result of industrial digitalization and improving standards of living in relevant countries.

■ **What's your 5G agenda for the year 2018?**

● Our primary focus is to put our customers at the centre of everything we do. Today, their priorities are as follows:
(a) Relentless Efficiency: Our priority is to work with our operator customers to accelerate 5G use cases, assist in the smooth transition to 5G, and work along with them to manage capacity growth.
(b) Digital Experience: We will deliver for our partners' automated and cost-effective operations with programmable networks for faster time-to-market and optimize network performance to radically enhance customer experiences.
(c) New Revenue Streams: We will work with operators to innovate and optimize on emerging business opportunities, connectivity services, and platforms to support growth of IoT.

■ **How long would the wait be for the commercialisation of 5G? The big question- when is 5G coming for real?**

We don't speculate on this and to be honest, it would difficult to provide a concrete timeframe, as 5G commercialization will entirely depend on market dynamics and maturities of the ecosystem in general. However, what is heartening to note is the fact we are not too far off from this reality. According to Ericsson's 5G Readiness Survey published in October 2017, 78% of respondents were involved in 5G trials in 2017 as compared to 32% in 2016. Furthermore, 28% of respondents expect to deploy 5G in 2018. The survey also revealed that operators have further developed their business strategies for 5G services, looking beyond the consumer segment to foresee opportunities in the enterprise and industrial segments as well.

The top three industry sectors that were highlighted by survey respondents were media and entertainment, automotive, and public transport; but many also ranked healthcare as well as energy and utilities among the most attractive sectors for 5G applications. A clear majority of respondents believe that Internet of Things will play an important role and that third-party collaboration will be essential in this context.

Orange 4G rollouts

In what's said to be one of the largest LTE rollouts in Africa, Nokia will modernise around 11,000 radio sites for Orange in Egypt, Côte d'Ivoire, Cameroon, Senegal, Mali, Guinea-Bissau and Niger. Under the three-year programme, Orange will use the vendor's Single RAN and network management technologies to support existing 2G and 3G subscribers while enhancing speeds and coverage as it launches 4G. To facilitate the deployment, Nokia has set up a dedicated West and Central Africa Support Centre for the operator.

Cyber threat in routers

Security experts at Kaspersky Lab have uncovered a sophisticated threat used for cyber-espionage in the Middle East and Africa that has existed since at least 2012. The malware, dubbed *Slingshot*, attacks and infects victims through compromised routers and can run in kernel mode, giving it complete control over victim devices. Kenya and the Yemen account for most of the 100 victims that have also been seen in Libya, Congo, Sudan, Somalia and Tanzania. Kaspersky Lab advises users of Mikrotik routers to upgrade to the latest software version as soon as possible to ensure protection against known vulnerabilities.

African-brand smartphone

African firm Mara Corporation is promising to launch a unique and high-quality smartphone across the continent in the next few months. The *Mara X* will be launched as part of Google's *Android One* portfolio and will run the company's latest OS, *Android 8.0 Oreo*. It promises to be "extremely affordable" and feature a "carefully curated" set of pre-installed apps. The Mara Group began as a small IT business in Uganda and has since expanded to become a multi-sector investment company that now employs over 14,000 people across 25 African countries and three continents.

Omantel and DE-CIX partner for global peering

Omantel Wholesale has partnered with DE-CIX to simplify and accelerate the speed at which local, regional and global service providers connect to the latter's worldwide internet exchange points.

According to Omantel Wholesale, the partnership is part of its global strategy for enabling transformation and innovation with ultra-low latency networking. The company is a member of the *Asia Africa Europe-1* (*AAE-1*) cable consortium and offers connectivity from South East Asia to Europe via the Middle East. (*Also see News, Jun-Jul 2017.*)

Customers that connect to

Cloud growth is driving demand, says Omantel Wholesale VP Sohail Qadir.

Omantel Wholesale's global network can use DE-CIX exchanges to peer, interconnect, and optimise cloud and content for end users. The partnership includes connectivity to DE-CIX IXPs in Marseille and Frankfurt, as well as Istanbul, Hamburg, Munich, Dusseldorf and New York through DE-CIX's *GlobePEER Remote service*.

Omantel Wholesale claims its geographic location and more than 20 subsea cable relationships enable it to create solutions that directly impact upon how its customers and their clients experience cloud, content, and their applications and services.

The company's VP Sohail Qadir says: "Growth in cloud and content is driving demand for enhanced quality of experience for end users around the world. This partnership will enable service providers to simplify how they connect to peering exchanges and create a 'one-stop shop' for customers using the *AAE-1* cable system."

Forensic lab to fight digital piracy in Egypt

The Government of Egypt is setting up a specialised digital forensic lab to protect intellectual property rights (IPR) as part of its efforts in fighting software piracy.

The new lab, which is said to be the first of its kind in the MENA region, is mainly designed to resolve business software and internet-based piracy cases. It aims to use cutting-edge techniques to safely recover data from digital devices and unearth new fraud techniques. It's claimed this will lead

to a roadmap for judges, prosecutors and lawyers, enabling them to distinguish counterfeit products from those that are genuine, and manage all IP and digital piracy issues.

The Information Technology Industry Development Agency (ITIDA) will host the lab at its premises in Cairo. The agency is the executive IT arm of the Egyptian ICT ministry and part of its remit is to enforce IPR related to software and databases.

In recent years, the ITIDA's

IPR office says it has undertaken comprehensive actions to increase IP enforcement with all the stakeholders. In 2017 for example, the office says it delivered technical expertise reports of 96 cases to the economic courts, registered 203 software programs, and issued 267 licenses for the first time.

Egypt's government is now preparing a draft for data protection and privacy legislation. It has reportedly already agreed a cyber crime law which is now waiting to be approved by parliament.

ALU and GE aim to establish "industrial powerhouse"

GE and the African Leadership University (ALU) are working together to help give the continent's professionals valuable digital skills.

The partners reckon their collaboration will lead to a "paradigm shift in industrial thinking" as African companies will be able to leapfrog competition and establish the continent as an industrial powerhouse.

US-based GE (formerly General Electric) describes itself as a digital industrial specialist. It says vast amounts of data are being created in an increasingly connected industrial ecosystem. But to leverage this, the company points out that what's required is a new generation of talent with a strong technical foundation in

Big Data analytics, machine learning and web application development, as well as the business acumen to translate technological improvements into business results.

GE will combine its claimed expertise with ALU's unique learning model for the *Africa Industrial Internet Programme* (*AIIP*). This 12-month professional training scheme, which began in January 2018, is designed to merge the essential business and technical skills necessary for professionals to succeed in a digital industrial environment.

The *AIIP* uses a blended learning model with a mix of online learning and offline sessions to be held at the GE Africa Innovation Centre in

Students will attend "intensive" 3-5 day sessions at GE's ZAR500m Innovation Centre in Johannesburg.

Johannesburg. It involves machine learning with what's said to be ALU's "unique" entrepreneurial leadership programme to prepare professionals for leadership roles in entrepreneurial and technology-driven work environments.

GE says participants will work with best-in-class technology including its *Predix* platform for the industrial internet to build applications that can solve complex problems.

WHERE THERE'S COMMUNICATION, THERE'S GROWTH

Avanti Communications' newest High Throughput Satellite, HYLAS 4, is a key milestone for the company as it endeavours to expand its broadband connectivity across EMEA, especially Sub-Saharan Africa.

David Bestwick, Chief Technical Officer, discusses HYLAS 4 and how it is bringing the highest quality Ka-band satellite capacity to Africa.

What regions will HYLAS 4 cover?

HYLAS 4 joins our existing HYLAS fleet and doubles our capacity. It will cover over 35 countries across Africa using 64 spot beams and 4 steerable beams that can be pointed to existing regions, providing additional capacity, or steered to new regions, opening up new markets.

What services will HYLAS 4 offer?

HYLAS 4 will provide reliable and cost-effective satellite capacity for a broad range of businesses. It will set a new standard for affordability and flexibility for Internet Service Providers who require broadband for homes and SMEs, as well as complex connectivity solutions for large enterprises, facilitating applications such as IP trunking, MPLS and Business Internet Continuity.

For Mobile Network Operators, HYLAS 4 will enable them to extend and improve their 2G, 3G and 4G networks, through our smart and proven Satellite Backhaul services.

We work closely with local governments and organisations to deliver high speed satellite broadband to schools and local communities, enabling access to e-learning and digital opportunities. Our network also satisfies the requirements of the security and defence sector by providing ultra-reliable and secure communications. Lastly, HYLAS 4, along with our existing coverage, enables us to provide capacity infill for other satellite operators, who may have gaps in their coverage.

What makes HYLAS 4 technology unique?

HYLAS 4 uses the latest Ka-band technology for higher throughput and greater efficiencies.

Ka-band satellites have been designed to deliver high speed data services while offering significant advantages over Ku-band and C-band capacity. The new satellite will provide low cost broadband capacity due to the efficiencies resulting from the use of small spot beams which concentrate power and re-use spectrum. This also means that end-user terminals are smaller, cheaper and easier to install. And with higher capacity than regular Ku-band satellites, HYLAS 4 is a future-proof solution that can satisfy any growth in demand. Moreover, HYLAS 4, as part of Avanti's extensive network, will provide a sophisticated offering allowing our customers to purchase an entire end-to-end, managed service from a single source.

Tell us more about Avanti

Avanti connects people wherever they are. We are experts in delivering world-leading Ka-band communications to our customers across EMEA, even in some of the most remote and challenging places.

It's also important to point out that not only do we own and operate a fleet of Ka-band satellites but we have also invested on the ground. Avanti has built diverse Gateway Earth Stations (GES) in countries such as UK, Germany, Cyprus, Turkey, Nigeria and South Africa, with further GES planned for Senegal and Kenya. This enables us to not only meet the needs of having data traffic land in-country, but also creates local employment opportunities in ICT, engineering and communications, as we work closely with local partners.

By increasing broadband access by 10%, it can enable GDP to grow by 1.4%*; HYLAS 4 covers 665 million people who could get access to the latest digital opportunities, which is why communication is so important for growth.

ITU Report – Impact of broadband on the economy

For more information, email **contact@avantiplc.com**, visit **www.avantiplc.com/HYLAS4** or call **+44 (0) 207 749 1600**.

Qualcomm rejection of Broadcom's proposal leads to bitter dispute

US president Donald Trump has now intervened in the war of words that has been raging between semiconductor device makers Qualcomm and Singapore's Broadcom. Their dispute follows a proposed takeover bid from Broadcom that was announced last year and would have become the biggest merger ever in the technology sector.

In early November 2017, Broadcom proposed to acquire Qualcomm in a transaction valued at USD130bn. Under the proposal, Qualcomm stockholders would receive USD70 per share consisting of USD60 in cash and USD10 per share in Broadcom stock.

Around two weeks later, Qualcomm's board unanimously rejected the offer, describing it as an "unsolicited proposal". Tom Horton, the company's presiding director, said: "After a comprehensive review, conducted in consultation with our financial and legal advisors, the board has concluded that Broadcom's proposal dramatically undervalues Qualcomm and comes with significant regulatory uncertainty."

In December, Broadcom notified Qualcomm of its intention to nominate 11 independent individuals for election to Qualcomm's board. Broadcom president and CEO Hock Tan said: "We have repeatedly attempted to engage with Qualcomm, and despite stockholder and customer support for the transaction, Qualcomm has ignored those opportunities. The nominations give Qualcomm stockholders an opportunity to voice their disappointment with Qualcomm's directors and their refusal to engage in discussions with us."

However, Qualcomm rejected the 11 nominees and described Broadcom's action as a "blatant attempt" to seize control of its board. The company also expressed concerns about the regulatory issues surrounding the proposal, and what it said were the absence of commitments by Broadcom to resolve those issues, its lack of committed financing, and the uncertainty surrounding its transition from Singapore to the US.

Broadcom reacted to this in an online statement issued in January 2018: "Qualcomm has once again made intentionally vague statements regarding 'regulatory challenges' that are simply unfounded, misleading, and a disservice to Qualcomm stockholders. Qualcomm's rhetoric is vague for a reason – because it is not grounded in reality."

The company went on to say that there were no antitrust issues concerning the proposed transaction, and that it had "extensive experience" of completing complex acquisitions and had begun the process of gaining regulatory approvals as well as "redomiciling" to the US by May 2018.

In early February, Broadcom improved its offer. Qualcomm stockholders would now receive an aggregate of USD82 per share consisting of USD60 in cash and the remainder in Broadcom shares. This was also rejected by Qualcomm. It said the proposal "materially undervalues" Qualcomm and falls "well short" of the solid regulatory commitment the board would demand given the significant downside risk of a failed transaction.

At a meeting between the two companies that took place on 14 February, Qualcomm continued to express concerns regarding the potential risks of the proposed transaction, despite Broadcom including an USD8bn regulatory reverse termination fee and six per cent per annum of net dividends in the event of a failed transaction.

By now, Broadcom was seeking the election of six rather than 11 nominees to Qualcomm's board and wrote to stockholders urging them to vote for this at Qualcomm's annual shareholders' meeting that was due to take place on 6 March 2018.

But two days before this, Broadcom claimed it discovered that the meeting would be delayed. According to the company, Qualcomm had "secretly filed" a request with the Committee on Foreign Investment in the United States (CFIUS) at the end of January 2018 to initiate an investigation. "It should be clear to everyone that this is part of an unprecedented effort by Qualcomm to disenfranchise its own stockholders," claimed Broadcom.

In its response, Qualcomm said: "CFIUS has determined that there are national security risks to the United States as a result of and in connection with the transaction proposed by Broadcom.

"Broadcom's dismissive rhetoric notwithstanding, this is a very serious matter for both Qualcomm and Broadcom. Broadcom's claims that the CFIUS inquiry was a surprise to them has no basis in fact. Broadcom has been interacting with CFIUS for weeks and made two written submissions to CFIUS."

In compliance with the committee's order, Qualcomm said its shareholders' meeting and election of directors would be delayed for at least 30 days pending a full investigation into Broadcom acquisition proposal.

However, in mid-March the White House stepped into the row and ordered Qualcomm to immediately and permanently abandon the proposed takeover saying that it could threaten US national security. According to reports, US officials also fear that the takeover could result in Chinese companies such as Huawei gaining a global lead in 5G development.

Developing markets spearhead mobile growth

The mobile industry signed up its five billionth unique mobile subscriber last year and is forecast to add almost another billion by 2025, according to GSMA Intelligence.

In its *Mobile Economy* report published in February, the association's research arm said there will be 5.9bn subscribers over the next seven years, which is equivalent to 71 per cent of the world's expected population by that point. The GSMA believes growth will be driven by developing countries, particularly Bangladesh, China, India, Indonesia and Pakistan, as well as markets across sub-Saharan Africa and Latin America.

The report also said that in under a decade since the first commercial 4G networks were launched, LTE is on track to become the world's leading mobile network technology by next year and to account for 53 per cent of global connections by 2025.

According to GSMA Intelligence, the mobile ecosystem accounted for 4.5 per cent of global GDP globally in 2017, a contribution equivalent to USD3.6tn in economic value added. It says this contribution is forecast to reach USD4.6tn or five per cent of GDP by 2022 as countries around the world increasingly benefit from the improvements in productivity and efficiency brought about by increased take-up of mobile services and M2M/IoT solutions.

Furthermore, the report said that in 2017, the wider mobile ecosystem supported 29 million jobs (directly and indirectly) and made a substantial contribution to the funding of the public sector; almost USD500bn was raised through general taxation while spectrum auctions brought in USD25bn.

MTN and Cisco Jasper partner to enable IoT in Africa

MTN has teamed up with Cisco Jasper to enable their business customers throughout South Africa to deliver IoT services worldwide.

While the companies will initially roll out their services in South Africa, plans are in place to expand connectivity by leveraging MTN's data centres across its 22 PoPs across the continent.

MTN will be the first mobile operator in the country to deploy *Control Center*, Cisco Jasper's automated IoT connectivity management platform. The partnership also represents the vendor's initial expansion into South Africa.

The operator said its business customers in nearly every industry are looking to innovate and transform their businesses by offering connected services. It reckons there is significant demand for the *Control Center* platform across all markets, particularly for telematics and vehicle diagnostics, vehicle tracking, building security and automation, and logistics.

"Over the past three years we have invested substantially in our network and have forged strategic partnerships with leading global players in the IoT space," said Mariana Kruger, GM for ICT solutions, MTN Business. "These interventions have put us in a better position to provide our customers with a distinct customer experience."

Kruger went on to claim that the partnership with Cisco Jasper has several synergies. She reckons both companies have the "capacity and expertise" to provide NB-IoT services to enterprise customers. "In addition, the technologies that we have invested in give MTN the ability to provide cutting-edge and tailored propositions to our clients, while delivering a secure and fool-proof connection," concluded Kruger.

Orange and Apigate to launch digital API hub
Orange and Apigate, a subsidiary of Malaysia's Axiata Digital, are partnering to strengthen their respective API hubs as part of their mutual ambition to advance global digital transformation.

The companies said that their new joint hub, *Bizao*, will draw on their respective geographical strengths across Africa, the Middle East and Asia to deliver a suite of APIs to businesses. They claimed this will provide a "streamlined and efficient" method of accessing customers via a single entry point across regions. The partners added that under their proposed collaboration, APIs can be delivered to international and local companies alike, resulting in consolidation of traffic and expansion of reach.

Apigate will deliver a digital enablement hub to the soon-to-be launched *Bizao*, as well as a hub-to-hub connection of the two operators' API platforms to facilitate a single technical, commercial, and financial integration.

Axiata Digital chief executive Mohd. Khairil Abdullah said: "This partnership marks an important milestone for the API businesses, where two major telecom operator groups are collaborating to expand their reach across each other's footprint."

Orange said its tie-up with Axiata symbolises its vision to partner businesses from the smallest startups to the largest organisations in order to help them seize all the opportunities presented by the digital age.

Convergence acquires stake in ESET Southern Africa
Convergence Partners and 4Di Group have acquired a "significant" minority stake in ESET's Southern African distributor. However, the two companies have not disclosed the size of the share or how much they have invested.

ESET is a global provider of internet and endpoint security software vendor. Cape Town-headquartered 4Di has represented and operated the brand in the region for 15 years as ESET Southern Africa, and among its other interests, it has distributed ESET's range security software in South Africa and Namibia.

Andile Ngcaba, founder and chairman of pan-African ICT-focused private equity firm Convergence Partners, said: "In the emerging native cloud environment, coupled with edge computing, data is

becoming more vulnerable. Cyber security solutions like that offered by ESET are a critical line of defence."

Convergence Partners has also acquired a stake in ESRO Ltd. It is ESET's official brand operator and distributor in the sub-Sahara Africa and broader East African region, covering 17 countries including Kenya with an operational office in Nairobi.

Satellite capacity pricing continues to fall amidst oversupply
Satellite capacity prices have fallen for a third straight year, according to a new study published by Northern Sky Research (NSR).

In its *Satellite Capacity Pricing Index, 4th Edition* (*Q1 2018*) report released in mid-March, NSR revealed that on average, capacity price declines for 2016-2018 ranged from 32 to 57 per cent across various applications and regions. According to the research firm, the road ahead "appears unclear as greater supply enters the scene, demand lags in some markets and competition intensifies".

NSR stated that while operators are now deploying strategies such

as vertical specific market entry partnerships and framework agreements on discounts, these haven't stopped the impact of the widening gap in supply-demand economics. It added that this trend is exacerbated by competitive sales positioning by operators in each region. NSR reckons that despite expecting to see smaller price decreases in 2019, the industry must wait longer for them to bottom out.

"With video hotspots facing pressure from both global pricing declines and OTT opportunities for non-streaming content, along with consumer broadband over Ka-band HTS consistently in the USD150 per Mbps per month range, the chances of recovery remain uncertain," said NSR analyst and report author Gagan Agrawal. "However, with capex per Gbps for new satellites marking new lows, declining lease prices come as a blessing to service providers in data and mobility, so they can fund expansion of their businesses and create mini telco businesses backed by satellite in the scaling process.

Agrawal believes that the satellite operator segment is also likely to take advantage of this downstream opportunity where managed services are expected to represent 15 to 25 per cent of the entire business portfolio in the next three to four years.

Full RAN virtualisation will take a decade and could delay 5G
It will take operators ten years to achieve full virtualisation of the RAN once they begin the process,
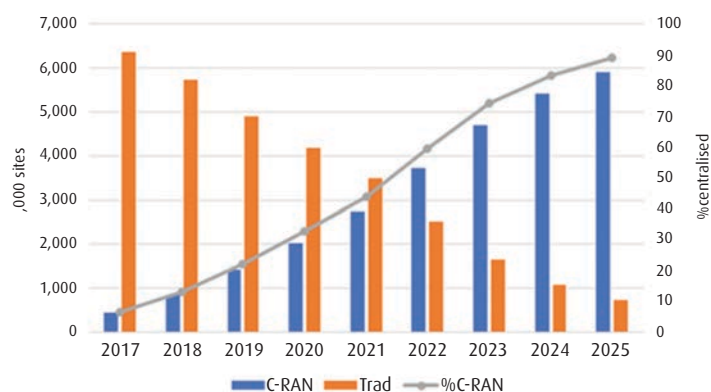
Centralised or virtualised site installed base versus traditional.

SOURCE: RETHINK RESEARCH

says Rethink Technology Research.

In its cloud RAN (C-RAN) deployment forecast 2017-2025, the analyst said that the move to a fully virtualised, cloud-based radio access network is being held back mostly by the lack of interoperable standards. "This is one of the main things preventing C-RAN from happening earlier, and most shipments will not start until this has been ironed out, a process that could take another three years before shipments break the three million a year barrier," stated Rethink.

As a result, the company believes centralised and virtualised macrocells and microcells will be deployed at a CAGR of 23 per cent between 2017 and 2025. And although these will overtake new deployments of conventional cells in 2019, it said most of these deployments will still be centralised rather than fully virtualised. Once operators start to deploy RAN

VNFs, usually conforming to ETSI NFV specifications, Rethink reckons there will be a sharp acceleration of growth in the number of C-RAN sites, adding that full C-RANs will remain rare until mid-2020.

"There is now a major dilemma for operators between simply using centralised RAN or going for a fully virtualised RAN," said the firm. "The former is simpler and delivers some efficiencies; the latter is very difficult and disruptive to implement, but we believe will revolutionise cellular economics."

According to Rethink, the two key barriers have been availability of fibre and the vendor "stranglehold" on the CPRI (common public radio interface). It said that this has meant most early C-RANs have had to be very localised.

"It is essential that new emerging standards, preferably from the IEEE, take hold to open up the ecosystem

and accelerate adoption," said the analyst. "Operators which support full C-RAN will have a far easier, cheaper task to implement 5G. However, the process of virtualising the RAN may delay 5G upgrades."

Rethink added that the biggest barriers to all types of C-RAN are related to fronthaul, mainly the availability of affordable, high quality fibre and the need to use the CPRI. It claimed that the latter has been controlled by a small group of vendors that implement it in semi-proprietary ways. "This raises high barriers to entry for alternative equipment providers, such as those supported under the Facebook Telecom Infra Project, and threatens MNOs with lock-ins and high prices. It also makes many C-RANs economically non-viable because of the high cost of low latency fibre and CPRI."

Rohde & Schwarz, Unigroup Spreadtrum & RDA to set up joint test lab
Rohde & Schwarz and fabless semiconductor company Unigroup Spreadtrum & RDA are to establish a joint operator test laboratory in China as part of an MoU signed in February.

The two companies say they will focus on wireless communications and test concepts to better serve their common customers, including the three Chinese network operators and other global operators that Rohde & Schwarz (R&S) has been serving for many years.

R&S will provide technical consultancy and product support in

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
31/1/18	Åsa Tamsons	Ericsson	SVP & head of business area emerging business	McKinsey & Company	Partner, Stockholm office
1/2/18	Jan Karlsson	Ericsson	Acting head of business area digital services	Ericsson	Head of solution area BSS
12/2/18	Steve Collar	SES	President & CEO	SES Networks	Replaces Karim Michel Sabbagh who will step down in April 2018 to "spend time with his family & pursue new interests".
12/2/18	Andrew Browne	SES	CFO	O3b Networks	Replaces Padraig McCarthy who has announced his retirement & will step down in April 2018.
13/2/18	Jeff Garte	Globecomm	CFO	Hibernia Networks	SVP of corporate development
15/2/18	Aamir Hafeez Ibrahim	VEON	Head of emerging markets	VEON	Jon Eddy, VEON's previous head of emerging markets, is stepping down. Ibrahim will now oversee the company's businesses in Algeria, Bangladesh & Pakistan while remaining CEO of Jazz in Pakistan.
5/3/18	Alioune Ndiaye	Orange	CEO for MEA	Sonatel Group	Director general
5/3/18	Bruno Mettling	Orange	Non-executive chairman for MEA	Orange	CEO for MEA
5/3/18	Helmut Reisinger	Orange Business Services	CEO	Orange Business Services	EVP international
5/3/18	Hugues Foulon	Orange	Executive director in charge of strategy for the group & cyber security	Orange	Director to the chairman & CEO, & secretary of executive committee
5/3/18	Mari-Noëlle Jégo-Laveissière	Orange	Deputy CEO of the group & CTIO	Orange	Senior EVP, innovation, marketing & technology
5/3/18	Jérôme Barré	Orange	CEO wholesale & international networks	Orange	Executive director, HR

the test lab. It will then collaborate with Unigroup Spreadtrum & RDA on testing for network operators around the world. The partners say their common goal is to enable chipset solutions that better fit global operators' requirements.

Unigroup Spreadtrum & RDA had already been working with R&S for 2G, 3G and 4G. R&S will now support Unigroup in 5G sub-6GHz and mmWave chipset design and development. The companies say this will ultimately accelerate 5G chip prototyping, and will further optimise 5G manufacturing and hasten the technology's time to market.

Further cooperation between the partners will look at automotive electronics and cellular and non-cellular IoT applications.

Ericsson off-loads most of Media Solutions business

Ericsson has partnered with One Equity Partners to further develop its Media Solutions business.

At the end of January, Ericsson concluded the review of strategic opportunities for the business which it began in March 2017. The company evaluated different opportunities for the units, including partnerships, divestments and a continued in-

house development, based on what generates the best long-term value.

One Equity Partners (OEP) is a private equity firm said to have a "deep expertise" in media and telecom investments. OEP and Ericsson will form an independent company with the latter retaining a 49 per cent shareholding. The Swedish company says this structure will establish Media Solutions as a "leading independent video technology company with strong and committed financial support driving continued investment in innovation and growth". The terms of the transaction remain confidential.

Media Solutions employees and contractors, as well as specified assets and liabilities, will transfer to the new company upon closing which is expected in Q318, subject to customary closing conditions and approvals.

Over the last several years, Ericsson says it has transformed its Media Solutions' products with what it says is a cloud-enabled, standards-based, integrated end-to-end roadmap. The overall mission has been to advance video service delivery with state-of-the-art infrastructure and software.

Angel Ruiz will continue to lead Media Solutions as CEO.

INVESTMENTS, MERGERS, ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
17/1/18	Baylin Technologies	Advantech Wireless	RF, microwave divisions & terrestrial antenna divisions	USD49m	Canada-based Baylin Technologies is the corporate head office of specialist antenna maker Galtronics. The company's purchase price for Advantech Wireless includes USD48m & USD1m in Baylin common shares at USD3.24 per share.
5/2/18	Singtel International Investments	Bharti Telecom	85,450,000 new equity shares	INR310 per equity share	The deal, which is subject to shareholder approval, will increase Singtel's stake in Bharti Telecom by up to 1.7% for an aggregate consideration of around INR26.5bn or SGD555.6m. Singtel's economic interest in Airtel will increase by 0.9 percentage point to 39.5%. Bharti Telecom retains around 50.1% of Airtel's share capital of Airtel.
28/2/18	EXFO	Astellia	Company	EUR25.9m	Canada-headquartered EXFO is acquiring 97.44% of Astellia's share capital & at least 95.07% of the voting rights. It reckons the purchase of the French company creates "a new global force in network test, monitoring & analytics".
16/3/18	Nokia	Unium	Company	NA	Nokia has now completed its acquisition of Seattle-based Unium. The firm's specialist software is claimed to provide operators with an intelligent mesh Wi-Fi solution that constantly optimises in-home Wi-Fi connections through self-learning & self-healing capabilities.

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
31/1/18	Ericsson	Sweden	FY17	SEK	201.3 (bn)	NA	-10.61	Reported sales decreased by -12%. Sales adjusted for comparable units & currency declined by -7% YoY, partly due to lower LTE sales in mainland China & earlier completion of larger mobile broadband projects in South East Asia, India, Middle East & Africa. As previously stated, write-down of assets was made in 4Q17, with a final impact on the result of -SEK14.5bn.
31/1/18	Qualcomm	US	1Q18	USD	6.1 (bn)	(27)	-4.03	Revenues up 1% compared to 1Q17 but negatively impacted by continued dispute with Apple & its contract manufacturers (who are Qualcomm licensees), as well as penalties such as $6bn charge relating to enactment of new tax legislation in US, & $1.2bn fine imposed by European Commission.
1/2/18	Nokia	Finland	4Q17	EUR	6,668	NA	0.19	On a constant currency basis, non-IFRS net sales increased 5% & reported net sales increased 6%, with 2% growth in Networks business & 80% growth in Technologies.
11/2/18	Ooredoo	Qatar	FY17	QAR	32,735	13,783	NA	Excluding forex issues, revenues increased by 2% compared to the reported 1% increase. In Africa, revenues in Algeria decreased 8% to QAR3.4bn, negatively impacted by VAT increase & weak economic environment; Tunisia continued to be impacted by unfavourable forex rates, & income was QAR1.5bn compared to QAR1.7bn in 2016.
16/2/18	Eutelsat	France	1H17-18	EUR	696.6	544.6	NA	Earnings down 7.7% compared to six months for December 2016. CEO Rodolphe Belmer says: "First half results were in line with our expectations, with the decline in revenues mostly reflecting, as in the first quarter, an unfavourable comparison basis in FY 2017."
22/2/18	VEON	Amsterdam	FY17	USD	9,474	3,587	NA	Group revenue for 2017 increased 6.6% , partially driven by consolidation of Warid in Pakistan & & positive effect from the RUB appreciation against the USD. Reported EBITDA increased 11% while underlying EBITDA decreased 0.4% organically to USD 3,675m. The FY 2017 underlying EBITDA margin was 38.8%, a decrease of 0.9 percentage points YoY, missing the FY17 target of flat to low single digit accretion, due to margin pressure in Russia, Algeria & Bangladesh.
23/2/18	SES	Luxembourg	FY17	EUR	2,035.0	1,324.2	0.80	Reported revenue down 1.6% & -5.2% YoY. Outgoing CEO Karim Michel Sabbagh said 2017 was a year of transformation as the company established two market-focused units, SES Video & SES Networks. He added : "Business performance was below our expectations as the market remained challenging throughout 2017, compounded by some fleet health issues."
26/2/17	Intelsat	US	FY17	USD	2,149	1,629	NA	Net loss of USD178.7m. CEO Stephen Spengler said 2018 targets are to capitalise on better performance & economics associated with the services delivered by the *Epic* high-throughput fleet which will be completed later this year with the launch of the Asia Pacific-oriented *Horizons 3e*. Company also plans to launch *Intelsat 38* in 2Q18.

JMA claims indoor wireless first with fully virtualised RAN

JMA Wireless claims its *XRAN* adaptive baseband platform is the first virtualised RAN built as 100 per cent software that is designed to scale to commercial networks on off-the-shelf server technology.

XRAN has been developed to provide all of the RAN functions necessary for complete LTE mobile and IoT connectivity, and integrates with JMA's *TEKO* DAS platform via high capacity fibre connectivity. According to the company, this eliminates costly layers of analogue equipment and cabling,

significantly reducing the footprint, power and cooling requirements.

JMA reckons this unique combined solution provides an entirely new approach for wireless systems in corporate and commercial buildings, large venues, and highly densified urban areas.

By leveraging embedded intelligence, the company says *XRAN* can increase or reduce site capacity based on how many mobile devices are present. Its adaptive baseband functionality applies

resources to sites when and where they are needed to "dramatically" increase utilisation efficiency.

JMA also claims its platform "significantly reduces" opex by providing IT-centric orchestration and policy-based operational tools. It says configuration, policy setting and monitoring are founded on web-centric interfaces to provide easy visualisation and streamlined workflows.

The firm adds that *XRAN*'s operations platform is compliant with 3GPP and industry standard

north-bound interfaces, and can therefore integrate with existing OSS and BSS within the network.

Regardless of where it is deployed, JMA says *XRAN* takes advantage of central operations and elastic resource intelligence, enabling operators to capitalise on the best economics for backhaul or fronthaul connectivity, as well as the benefits of cloud economics.
jmawireless.com, xran.com
Analyst warns full RAN virtualisation will take a decade – Wireless Business, p16.

Helping extract the most from location-based services

Intersec says its *Geo-Intelligence Suite* represents a major step forward towards helping telcos in gaining the maximum benefits of end-to-end location-based offers.

The new suite is based on Intersec's *Fast Data Analytics* platform and features a complete array of location-based solutions. These include *GeoInsights* which provides demographic studies for smart cities, transport planning, geomarketing and billboard audience monitoring, among others. There's also *GeoReach* for location-based advertising, enabling brands to trigger ads based on their audiences' locations, as well as *GeoTrack* for IoT tracking and asset management, insights and business processes.

Other features include: *GeoSafe* for connectivity to public warning

systems; *GeoHub* which enables third-party applications to leverage location events; and *GeoTravel* which can be used to customise customer engagement before, during and after roaming abroad.

Intersec claims its unique location-based approach lies in the combination of a number of factors which include: traditional active queries with passive collection of signalling traffic; the orchestration of both methods; the ability to narrow location to subcell levels; the ability to store location information into a historical database; and to work on all technology networks, including Wi-Fi.

The firm adds it will be developing additional products to offer off-the-shelf use cases to its customers, as well as a data marketplace.
www.intersec.com

Advantech Wireless releases solid-state power amplifiers

Advantech Wireless Technologies has launched a new 3.2kW Ku-band outdoor modular satellite solid-state power amplifier. (SSPA).

The firm says its new modular *Summit* systems are designed to be used as direct replacements of older generation Klystron vacuum tube or TWT (traveling-wave tube) amps. Advantech says the all outdoor ruggedised systems offer very high power and wide bandwidth to allow operation over the entire Ku-band spectrum with multiple carriers and "outstanding" linearity.

The systems are said to feature built-in redundancy with soft failure mode, and are able to operate simultaneously on both polarisations or on a single polarisation with double amount of power.

Advantech says the new design

concept is in response to the higher power and wider bandwidth demand of traditional large teleports while at the same time reducing opex. It reckons that the new amps are ideal for large DTH teleport uplinks.

The company adds that without using expensive filter combiners, its system is ready today to support new higher modulation and error correcting codes, as specified in DVB-S2X, or higher data rates. Combined with a high gain antenna, its says the system can completely saturate all transponders on any satellite.
www.advantechwireless.com

GCF certifies LTE devices for critical communications

The Global Certification Forum (GCF) is extending its certification scheme to critical communications devices. The required test cases are expected to be finalised by 3GPP RAN5 during 1Q18, paving the way for Mission Critical Push-to-Talk (MCPTT) over LTE device certification to start later in the year.

In response to demand from public safety authorities for access to secure wireless broadband communications, 3GPP is developing specifications to deliver a variety of mission critical

capabilities over LTE networks.

MCPTT provides enhanced voice-based PTT communication based on the 3GPP Evolved Packet System.

It leverages Group Communication System Enablers and Proximity-based Services, and is part of Release 13 of the 3GPP specifications. Mission Critical Video over LTE and Mission Critical Data over LTE have already been standardised within Release 14, while further enhancements are being developed for Release 15. These additional features could also be brought within the scope of GCF certification in response to requests from members.

In an MoU that was updated earlier this year, the GCF and TCCA (TETRA and Critical Communications Association) have committed to work together in areas related to 3GPP Mission Critical Services.

The GCF has also extended its membership categories to now include virtual network operators which will make certification accessible to MVNOs including public safety network providers.
www.globalcertificationforum.org

World's first dual-band beamforming base station

RADWIN says it's come up with the world's first dual-band beamforming base station. It says the new *JET DUO* integrates both 3.4GHz to 3.7GHz and 4.9GHz to 6.0GHz radios to deliver 1.5Gbps data speeds.

By providing both the 3.5GHz and 5GHz bands in a single compact unit, RADWIN reckons service providers will be able to "significantly reduce" installation costs, tower space and rental expenses associated with deploying multiple single-band base stations.

It says service providers can use the 5GHz band for residential customers while freeing-up the 3.5GHz band for more "lucrative"

SLA customers. RADWIN says they can also utilise 5GHz for customers in scenarios with direct line-of-sight (LOS) while using the 3.5 GHz band to serve those in non-LOS scenarios.

According to the company, 3.5GHz service providers that deploy *JET DUO* in their access network get an overlay 5GHz high capacity network for a "mere fraction" of the cost. It adds that the new device also means users can mitigate the 3.5GHz spectrum bottleneck while dramatically cutting their ongoing opex and capex to lower TCO.

JET DUO features independent beamforming antennas for each band. The all-new solution incorporates RADWIN's second generation 5GHz beamforming technology to ensure what's described as "unparalleled interference immunity and highest spectrum efficiency".
www.radwin.com

G+D integrates M2M and consumer SIM cards for connected car users

G+D Mobile Security has unveiled an eSIM management enabled solution that will allow car owners to download their private mobile subscription to a second SIM which is soldered into the vehicle's telematics box.

While M2M-SIM cards are already a common feature in most modern and connected cars, access and usage of this integrated card is limited to eCall and other telematic services provided by the car-maker.

G+D Mobile Security has worked with BMW, Intel, Deutsche Telekom and AT&T on a system that will allow car owners to use their existing data

plans and to access information services by using their vehicles as the mobile device. Phone calls can be received/placed via the in-car infotainment system under their usual number. After an initial eSIM-based registration process with the mobile operator, car owners can then also use their data services in the car.

The integration of the consumer SIM card and the car user's mobile subscription is achieved via *AirOn*, G+D's eSIM management solution which supports both M2M and consumer applications, and enables the download of eSIM profiles over-

the-air. According to the firm, the solution enables new application opportunities for cellcos, car manufacturers, car OEMs and end users. It claims several devices can be connected with the network in an easy and fast way, while the "highest security and scalability is provided by the user-friendly service platform".
www.gi-de.com/mobile-security

Next-generation broadband gateways

ARRIS International has introduced what it says are two future-ready next-generation broadband gateways that offer flexible network migration.

The *NVG578* is a customisable PON (passive optical network) gateway that promises to deliver the scalability service providers need as they evolve their networks to meet the demands of new services and faster speeds. This includes today's GPON speeds, as well as next-generation XGS-PON and NG-PON2 speeds of up to 10Gbps symmetrical.

On the wireless side, the *NVG578* supports *Gigabit Wi-Fi* with options

to offer 802.11ac and upgrade to .11ax in both dual-band and tri-band configurations.

ARRIS says the device also makes smart-home integration easy, thanks to optional IoT radio support. It reckons service providers get the connectivity, reliability and longevity that is now expected from a hub supporting the rapidly growing number of smart-home devices.

The second device is the *NVG558*. According to ARRIS, this is an advanced fixed wireless broadband gateway that supports triple-play services thanks to integrated technology that can deliver LTE and 3.5GHz CBRS. It says the unit also has potential to support future 5G services.

Both platforms offer *Docker* container support and also feature *HomeAssure*, ARRIS' intelligent Wi-Fi solution that extends coverage and is said to simplify the end-user Wi-Fi experience.
www.arris.com

Vodafone displayed its 4G lunar base station at Mobile World Congress in February.

Vodafone to set up LTE network on the Moon

Vodafone plans to create the first 4G network on the Moon. Berlin-based PTScientists is working with the mobile operator's German division and car-maker Audi to achieve the first privately-funded lunar landing next year.

In collaboration with Nokia, Vodafone will create a network that will connect two Audi-designed lunar rovers to a base station in the Autonomous Landing and Navigation Module. Nokia Bell Labs says it will create a space-grade 'Ultra Compact Network' that will weigh less than one kilo, the same as a bag of sugar.

The 4G network will enable the lunar vehicles to communicate and transfer scientific data and HD video while they carefully approach and study NASA's *Apollo 17* lunar roving vehicle that was used by the last astronauts to walk on the Moon in December 1972.

Vodafone testing indicates that the base station should be able to broadcast 4G using 1800MHz spectrum and send back the first ever live HD video feed of the Moon's surface. This will be broadcast to a global audience via a deep space link that interconnects with the PTScientists server in the Mission Control Centre in Berlin.

PTScientists CEO and founder Robert Böhme says: "This is a crucial first step for sustainable exploration of the solar system. In order for humanity to leave the cradle of Earth, we need to develop infrastructures beyond our home planet.

"The great thing about this LTE solution is that it saves so much power, and the less energy we use sending data, the more we have to do science."

The Mission to Moon is due to launch in 2019 from Cape Canaveral on a SpaceX *Falcon 9* rocket in 2019.

Value-added services: follow the money?

When it comes to VAS, RAHIEL NASIR wonders if there's life beyond mobile money for MNOs struggling with flatlining ARPUs.

Mobile operators need to offer their customers more than just basic voice and text services if they want to boost average revenues per user. And here, there can be little doubt that the continent leads the way in one particular aspect – mobile financial services.

MFS, especially mobile money, has long been hailed as an African success story, and the one operator whose name consistently comes up here is Safaricom. In March 2017, the cellco marked 10 years of *M-PESA* in Kenya with the publication of a study that revealed that when the platform was first introduced in March 2007, it attracted 20,000 customers. By March 2016, that had grown to more than 16 million users, while the value of transactions had risen from KES10.3m (USD101,764) to KES5.2 trillion (USD5.1bn) over the same period.

Rwanda is perhaps hoping to emulate that success as it seeks to move from a cash-based economy to a digital one. According to Ecobank, the number of digital transactions in the country increased by 11 per cent from 1.37 million in the first half of 2016 to 1.53 million in 1H17.

Speaking at the *Africa Tech* summit that took place in Kigali in February 2017, Nshuti Lucy Mbabazi, assistant VP of push payments at the Ecobank Group, said Rwanda has witnessed a 26 per cent increase in the volume of digital transactions, from 8.6 million in 2016 to 119 million in 2017. She said this represents a 33 per cent rise in value from RWF469bn (USD552m) to RWF622bn (USD732m).

Ecobank said millions more people on the continent now have access to financial systems thanks to cashless systems using digital technology, and more are seeing the benefits of mobile banking.

"Going digital provides not just better services and connectivity, but enables banks and businesses to unlock productivity and play a role in development," said Mbabazi. "Africa is now at the forefront of financial technology with 57.6 per cent of the world's 174 million active registered mobile money accounts (100.1 million) in sub-Saharan Africa. Fintech in Africa is predicted to grow from USD 200m to US3bn by 2020."

Anil Krishnan, head of Africa Region at India-based global VAS specialist Mahindra Comviva, believes mobile money's role in the socio-economic transformation of millions of people on the continent can no longer be ignored. "In Kenya, Tanzania, and Zimbabwe, mobile money is banking the unbanked, which is allowing them to pay their bills on time, access government services, send their children to school, secure micro-credit and loans, [etc.].

"Mobile money is also helping in the preservation of old customs and traditions. For example, it is helping to digitise traditional savings club in Zimbabwe known as *Maround* or *Mukondo*."

Cashing in

Thomas Chalumeau, MEA strategy director at Orange, says Africa still has a low banking rate, and that mobile-based services are heavily relied upon given the lack of physical infrastructure compared to the huge appetite for services.

But he also points out that although providing mobile financial services has been the most prominent and pervasive of diversified services in Africa, it is certainly not the only one, and nor is it the only one that's rapidly growing.

Vaibhav Mehta, SVP of new business at Sterlite Tech – Software, agrees that mobile money and mobile financial services are the fastest-growing segments of the industry, adding that this not just in Africa but across the world. "It is truly said that

fortune lies in the bottom of the pyramid, and so banking the unbanked is good for African MNOs.

Tola Mobile is a UK-headquartered mobile payment service provider with offices in Ghana, Kenya, Tanzania and Uganda. The company lists Airtel, MTN, Mcel and Vodacom as some of its mobile customers in Africa, and last October it announced that 15 million monthly transactions are now processed across the continent via its *Tola Wallet* platform.

Simon Pepper, Tola Mobile's head of product, reckons VAS has long been associated with 'premium services' from European MNOs who wanted to build out their product portfolios and grow ARPUs through additional services on top of just minutes and texts. He believes they tried to introduce services with high price points, such as MMS and LBS, only to find that OTT services have relegated them to just bit pipe providers.

But in Africa, Pepper says MNOs in Africa have a different opportunity. "The customer's handset is so important because it holds their funds through mobile money wallets. It is also fully inclusive in that financial services and a payment method/instrument can be provided to anyone in ownership of a phone, as opposed to them holding a bank account, credit cards, etc."

According to Pepper, mobile subscribers in sub-Sahara Africa are not as available to OTT service providers as smartphone penetration is not so high. "The use of the Nokia 'candy bar' is still how many people make and receive calls and texts, and access their mobile money wallets. Plus, data packages are expensive and limiting."

Few would dispute that 'banking the unbanked' is a worthy quest. But is there life beyond mobile money for African MNOs who want to cash in on other kinds of value-added services? Of course, MFS and VAS are not mutually exclusive and one can lead to the other.

Pepper says that unlike developed markets, Africa does not have the widespread availability of desktop PCs, laptops or tablets that can offer a platform for mass advertising and commerce, so there remains a huge opportunity to address the MNO's customer base with digital marketing and services.

Mahindra Comviva says it is beginning to see its operator customers move away from 'traditional' VAS to mobile commerce. "It is mainly because mobile money and mobile financial services are solving real problems on the ground that have a bearing on the day to day life of the ordinary people," says Krishnan.

As an example, he says when Tanzania was going through a 'small change' problem, a leading telecom operator stepped in with an innovative solution using contactless payments technology. Krishnan adds that the growing popularity of micro-lending is following a similar pattern in

Anil Krishnan,
Head of
Africa region,
Mahindra Comviva

"The era of voice and SMS as the main growth areas for operators is slowly diminishing."

many African countries. "There was a gap in service (in this case, credit) which was filled by mobile money where the subscriber's airtime usage helped in qualifying a credit limit."

Meanwhile, Orange's Chalumeau believes providing VAS across the continent is more important than ever before because it is a land of continuing growth. "If you look at the population, it is younger than other regions in the world (average age is less than 30), and they are driving a huge demand for digital services. Furthermore, the middle class is developing and represents a third of the population, and more families are online."

Mobile money and mobile financial services are the fastest-growing segments of the industry.

Orange says providing VAS across the continent is more important than ever before because it is a land of continuing growth.

Chalumeau says Orange is developing new services and usages in areas as diverse as B2B, e-commerce, energy, e-health, agriculture, cyber security and digital services for education and teaching, just to name a few. He also cites energy as an example: "In Africa, very few companies have, until now, thought of deploying an electricity grid in rural areas. But today, for USD50 to USD200, you can buy a kit including solar panels and a battery."

Lumos Mobile Electricity Service is doing something similar in Nigeria's energy market after launching its service in partnership with MTN last year. The Abuja-based firm recently announced that it has now deployed its 60,000th *Y'ello Box* device that enables users to pay for solar electricity in their homes via their mobiles. As a result, Lumos claims more than 300,000 people across Nigeria are now benefitting from affordable, reliable, clean electricity (*see News, Dec 2017-Jan 2018*).

The *Y'ello Box* system comprises an 80W solar panel and cable, an eight-socket power unit, USB mobile phone adapter and two LED lights. Once an MTN subscriber joins the service, they pay their monthly subscription fee for power from their mobile airtime account by texting a simple code. Lumos points out that there's no need for mobile money, bank accounts or expensive machines.

Chalumeau continues by saying that mobile operators also have a role to play in the energy market in regions that are already electrified. Here, he says cellcos such as Orange can support smart meters to help energy providers combat the big issue of electricity theft and fraud. Such meters are also designed to help customers manage their energy spend. "For example, it is possible for a bar owner to purchase two hours of electricity to enable them to broadcast a football game, which can be paid for by mobile payment," says Chalumeau.

Away from energy, he goes on to say that around 400,000 farmers in Mali currently rely on mobile applications to check weather forecasts or track market prices for selling their crop or purchasing fertiliser.

There is no doubt that the rise in data traffic will result in the continued development and launch of innovative VAS. In fact, there is a widely

regarded view that operators will actually have no choice but to do this. As is all too familiar in mobile markets the world over, stiff competition and declining revenues from SMS and voice have led to collapsing ARPUs. Therefore, in order to stay relevant and profitable, MNOs are left with no other option but to offer VAS to monetise their network investment.

"According to Persistence Market Research, the global mobile VAS market is set to reach USD698,900m by 2022," said Sterlite's Mehta. "In the past, developing economies have followed the trend laid by the developed economies, and that holds true for Africa as well. And so the region's MNOs have to invest in upgrading their network, systems, and processes to offer VAS in their region."

Cashing out?

Earlier, Tola Mobile's Pepper spoke about the "huge opportunity" MNOs have to address their customer base with digital marketing and services. However, he also warns that the subscriber will quickly become "desensitised and overcome", so careful targeted advertising, based on personal profiling, behaviour, location and preference is certainly the way forward.

Simon Pepper, Head of product, Tola Mobile

"The use of the Nokia 'candy bar' is still how many people make and receive calls and texts, and access their mobile money wallets."

Mahindra Comviva's Krishnan agrees: "The era of voice and SMS as the main growth areas for operators is slowly diminishing. They need to focus more on non-voice revenues through locally relevant value-added services to grow their incomes."

Here, more needs to be done in Africa in order to create the ecosystem that is needed to develop locally relevant VAS, and Krishnan calls for more collaboration between the various stakeholders to create long-term benefits.

"For example, silos in mobile money services are affecting its reach and scope. In this regard, greater account-to-account interoperability can help the users of different mobile money services to move funds between all mobile money and bank accounts."

Pepper also highlights the importance of interoperability, particularly when it comes to running VAS on any type of phone. "The ecosystem needs to be established so that everyone can avail of the service, and that it can operate on every type of mobile device handset, in good and poor coverage situations," he says.

That requires a solid mobile device management (MDM) according to Sicap which specialises in this area. Magnus Moller Petersen, its EVP of sales and marketing, says operators are not knowledgeable about what is needed here and that MDM is not a focus area for them. "If you buy this kind of solution to have in-house, you need to have dedicated people working with it. Otherwise, it will be a black box and operators will lack the knowledge to maintain and manage that solution.

"It is very old school to do these things with this kind of solution. It needs to go into the hands of the vendors or those who can deliver a managed service. You minimise your operational costs and have a reliable partner that you can engage with and get help and training. The operator can also have discussions with the vendor about how to maximise data penetration and create strategies. That is the way forward."

Orange believes that encouraging, supporting and nurturing local, entrepreneurial innovation is essential. Chalumeau says that's why the company created new R&D centres and

development teams, including *Orange Fab*, its accelerator programme that offers selected startups three months of support to allow them to develop their products and services. In Africa, Orange has opened incubators in Senegal, Mauritius, Niger, Mali and Guinea. In June 2017, the operator also launched a new investment initiative of EUR50m devoted to startups in Africa (*see Wireless Business, Jun-Jul 2017*).

"Orange's investment in Africa is around EUR1bn each year, making us one of the largest private investors on the continent," says Chalumeau. "We also invest heavily through research and development because we know that by boosting growth in Africa, we can create new income not just for Orange but for the countries. We help to create jobs, support locally grown talent, help skills development and create new opportunities and usages for Africans.

Tola Mobile says it works extensively with MNOs in Kenya, Tanzania, Uganda, Ghana, Mozambique, Rwanda and South Africa to integrate its platform with their networks. "Our developers have already integrated and deployed additional services in each of these countries, processing many millions of financial transactions and SMS messages, as part of service delivery offerings to the subscriber base in these countries," says Pepper.

As well as MNO, the company's platform is also used by other digital service providers. For example in Tanzania, online sports betting company Mkakabet is said to be using *Tola Wallet* to streamline mobile payments, fuel expansion and simplify admin.

Tola claims its services enable companies looking to receive payments from mobile money. It says a single API connection allows organisations to receive and make real-time payments at the same rates as bank or credit card transactions. The company adds that it can also reconcile transactions that would previously have been delayed or even potentially lost when mobile network outages and downtime occur.

The future

On the subject of network infrastructure, without greater access to mobile broadband and more affordable smartphones, does Africa's VAS future look bleak?

Sterlite's Mehta says high-speed internet and the affordability of smartphones are the basic infrastructure requirements to launch innovative VAS services anywhere in the world. Chalumeau agrees when he says that smartphone penetration and access to very high-speed broadband networks are key for a better customer experience. But he also points out that operators can and have already deployed VAS through USSD and SMS and call centres to bring value to users. "These are equally important as they enable us to keep providing valuable services to customers while we continually improve network bandwidth, coverage and access to smartphones for our African customers."

Mahindra Comviva's Krishnan supports this view when he says that USSD is a key growth driver in VAS, adding: "USSD-based services are allowing Africa's VAS providers to offer products to both feature phone as well as smartphone users."

Pepper is also in no doubt that Africa does not necessarily need mobile broadband and sophisticated phones to capitalise on VAS. "We support communication methods that operate on all handset regardless of being smartphones or not. In fact, for many subscribers, their package doesn't include a data provision thereby rendering a smartphone and its focus on internet-based communication null and void. ∎
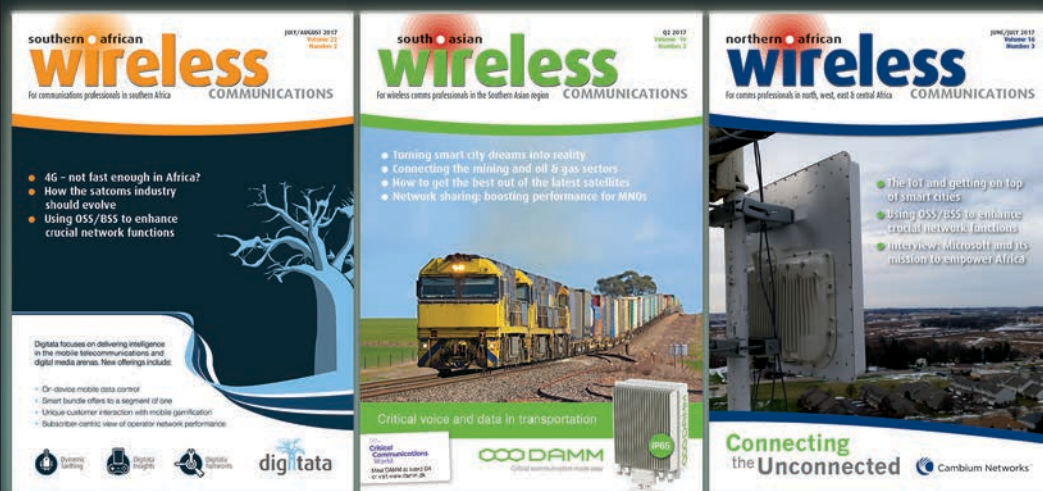
How wireless radio frequencies enable the IoT

When it comes to implementing an RF-based solution in IoT architecture, Amphenol RF says the quality of the connectors used will go a long way to determining how well the solution will perform.

PHOTO: GSMA

Due to the wireless nature of applications in the Internet of Things, RF components are positioned to be an integral part of the network infrastructure, as AMPHENOL RF explains.

The Internet of Things is delivering the promises of greater efficiency, improved production, enhanced and new services, as well as deeper levels of control and data acquisition for city planners, city managers, agriculture, manufacturing and consumers.

The widespread availability of wireless connectivity is fuelling the growth and success of IoT solutions. And because such solutions typically rely on resources distributed over wide geographical areas for system operation, RF-based infrastructure is ideal.

The benefits of the IoT are well documented, and as well as being used to deliver optimised use of existing infrastructure, solutions also promise:

- Decentralised access to legacy databases to facilitate self-service by stakeholders in various instances such as license renewal and registration
- Integration of AI for semi-autonomous operation of manufacturing, agricultural and urban processes
- Acquisition of larger volumes of more detailed data to support continual process optimisation

While IoT solution architecture includes both software and hardware components, let's focus on hardware.

Widely distributed hardware resources are used to provide the localised control, communication and data acquisition capabilities required for effective operation. These resources can include: existing Wi-Fi networks; smart or internet capable devices such as sensors and environmental monitors; hubs collecting input from several wireless and wired devices; and additional devices required to manage the efficient flow of communications and commands, including internet and other network servers.

Challenges of IoT implementation

Smart city IoT solutions are designed to improve utilisation of capital investments including optimisation of traffic flows on highways, light rail and public transportation management, provision of online services from existing systems, etc.

However, impediments to deploying smart city IoT solutions can include:

- Establishing locations for the distributed devices
- Gathering the necessary permits required for co-location on or in existing utility infrastructure
- Implementing the solution quickly and cost effectively
- Operating and maintaining the deployed solution

Meanwhile, smart agriculture IoT solutions address water management, monitoring environmental variables relating to soil, plant health, water and heat stress of animals, monitoring animal health, managing livestock feeding on a per animal basis through RF tags, integration of weather data for crop management, links to commodity markets, and use of distributed or mobile devices. Impediments here can include:

- Distances between IoT hardware components
- Lack of existing utility infrastructure (poles, cell service, etc.)
- Harsh operating environments

The idea of Industry 4.0 might be considered more akin to smart agriculture than smart cities because of the harsh environments encountered in many situations and the potential for significant distances between hardware components.

Consider, for example, mining, refining, and chemical production operations. These situations typically occupy sizeable areas and many of the process components are located outside. Structures for attaching wires may be widely separated or be unsuitable for direct attachment.

Furthermore, IoT components can be exposed to the weather as well as dusty, caustic or corrosive environments that can impact hardware life and functionality.

Regardless of the IoT application, RF provides an optimal solution in many, if not the majority of, cases.

Wired solutions, on the other hand, bring a number of issues. For instance, running additional wire (copper, fibre or coaxial) on poles requires permits and permission from the host utility. Adding wires may also necessitate a loading study to confirm the ability of the poles to handle the extra wire's weight, weight from icing on the new wire, as well as wind loading. What's more, co-location on utility poles and other facilities typically incurs an ongoing, periodic fee.

Meanwhile, underground wiring involves expensive excavation and repair of disrupted
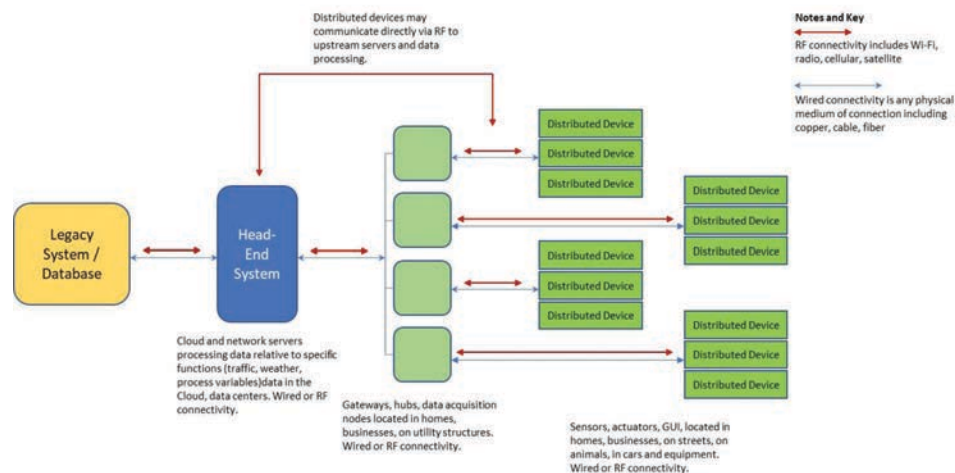
Simplified IoT architecture and connectivity.

surfaces. If the wiring breaks, it must be repaired by qualified crews, and if it is underground, the cost and delay is significant.

On top of all this, there may actually not be any poles available when it comes to smart agriculture deployments, and going underground is rarely practical.

Solutions that are based on RF are ideal for a number of reasons: there are fewer co-location requirements; they are easier to maintain (a failed unit can often be put back into service with a board replacement); they provide architectural

design flexibility and support 100 per cent wireless or hybrid approaches; and they create the infrastructure for connecting mobile distributed devices carried on vehicles and farm equipment.

The perfect connector for optimal RF performance

More devices than ever before are being sold with a wireless connectivity capability. This additional capability is an acknowledgement of the flexibility RF provides, and is a response to widespread

availability of radio frequency systems that provide internet access for cloud-based control and data analysis.

This rapid growth can put engineers at a disadvantage if they do not have RF experience or lack a track record of integrating RF capable components in their designs. Amphenol RF claims to be the largest RF connector provider globally, and the company says engineers and installation technicians should be able to address a number of key issues when deploying wireless connectivity solutions such as:

- Does the RF device's PCBA (printed circuit board assembly) use through board or surface mount components? Which connector is best suited for the situation?
- Are the PCBA launch geometries (antipads, trace widths, and gaps) optimised to handle the project frequency?
- What type of antenna connection is preferred to meet initial cost requirements and ease of future maintenance?
- What type of data and command communication is required in terms of quality, packet size, and speed?
- Where will the RF device be mounted – in an enclosure, corrosive environment or harsh weather environments?
- What are the RF frequency and quality requirements?
- Are the antennas mounted internally or externally?
- What type and form factor of antenna is being used? How far is it from the RF Hardware?
- How many distributed devices will be connected to a single antenna? Is a multi-port connector or single connector more applicable?
- Can the design utilise pre-configured, off-the-shell assemblies or is a custom connector more beneficial?

Table 1 (*above right*) is taken from an article review written by Judith Sobotie[1] regarding the Padova, *ITALY Smart City* project. The table illustrates the complexity of a smart city technical architecture in terms of integrating the various components into a properly functioning IoT solution. It lists communication options, data timing, packet sizes, and more.

It is crucial for engineers to select the right connector for each layer in any proposed

Service	Network type(s)	Traffic rate	Tolerable delay	Energy source	Feasibility
Structural health	802.15.4; Wi-Fi and Ethernet	1 pkt every 10 min per device	30 min for data; 10 sec for alarms	Mostly battery powered	1: Easy to realise, by seismograph may be difficult to integrate.
Waste management	Wi-Fi; 3G and 4G	1 pkt every hour per device	30 min for data	Battery powered or energy harvesters	2: Possible to realise, but requires smart garbage containers.
Air quality monitoring	802.15.4; Bluetooth and Wi-Fi	1 pkt every 30 min per device	5 min for data	Photovoltaic panels for each device	1: Easy to realise, but greenhouse gas sensors may not be cost effective.
Noise monitoring	802.15.4 and Ethernet	1 pkt every 5 min per device	5 min for data; 10 sec for alarms	Battery powered or energy harvesters	2: The sound pattern detection scheme may be difficult to implement on constrained devices.
Traffic congestion	802.15.4; Bluetooth and Ethernet	1 pkt every 10 min per device	5 min for data	Battery powered or energy harvesters	3: Requires the realisation of both air quality and noise monitoring.
City energy consumption	PLC and Ethernet	1 pkt every 10 min per device	5 min for data; tighter requirements for control	Mains powered	2: Simple to realise, but requires authorisation from energy operators.
Smart parking	802.15.4 and Ethernet	On demand	1 min	Energy harvester	1: Smart parking systems are already available on the market and their integration should be simple.
Smart lighting	802.15.4; Wi-Fi and Ethernet	On demand	1 min	Mains powered	2: Does not present major difficulties, but requires intervention on existing infrastructures.
Automation and salubrity of public building	802.15.4; Wi-Fi and Ethernet	1 pkt every 10 min for remote monitoring; 1 pkt every 30min for in-loco control	5 min for remote monitoring, few seconds for in-loco control	Mains powered and battery powered	2: Does not present major difficulties, but requires intervention on existing infrastructures.

Table 1: Services Specification for the Padova City Project

solution. Amphenol RF can help by offering an extensive array of technical product and product application data in addition to its engineering capabilities. One example is the availability of *ANSYS HFSS 3D* component models (*see figure 1 below*) for many Amphenol RF connectors. These free downloadable files allow engineers to test a PCB connector's performance in their PCBA design with an extremely high degree of accuracy. These files eliminate the need for building prototypes to determine performance, reducing both development costs and time.

When it comes to implementing a RF-based solution, the quality of the connectors used will go a long way to determining how well the solution will perform. Regardless of the type required, a reliable, durable, high-performance connector is a necessity for optimisation of RF signal transmission. Proper connector specification and procurement is critical.

Examples of end use applications

Prefabricated wireless modules that incorporate Amphenol RF connectors are commercially available. These modules are designed to provide engineers with compact, functional sources of wireless and RF connectivity including Wi-Fi, ZigBee, and Bluetooth. The modules are frequently part of the reference designs that engineers utilise to speed development of their own products.

RF connectors are designed into a PCBA to facilitate connection of antennas, support the frequency and impedance of the solution, and protect against environmental conditions (IP67 or IP68 spec connectors).

Pre-configured cable assemblies are designed to provide affordable, proven antenna connectivity to antennas located outside the electronics case or inside larger hardware cabinets. They are also ideal for prototyping hardware designs.

Custom cable assemblies can be engineered and manufactured to solution specific requirements that existing, off-the-shelf alternatives cannot satisfy. For instance, Amphenol RF can manufacture cable assemblies that: incorporate any connector configuration; use any cable type including those that are ruggedised and armoured; support hybrid RF/digital solutions; support ganged connectivity; comply with IP67 and IP68 protection.

Every RF device has an antenna and nearly every antenna needs a connector. Amphenol RF connectors employ the most advanced materials and production methods without compromising manufacturing efficiency and productivity. The company's connectors' role in the IoT ecosystem is fundamental to the proper functioning of IoT solutions by providing sound, reliable, durable, and high performance connection to antennas and delivery of the RF signal with minimal loss and distortion. ∎

The above feature is based on the article Amphenol RF enables the Internet of Things, *first published in January 2018. All content and material is published here with kind permission of Amphenol RF.*
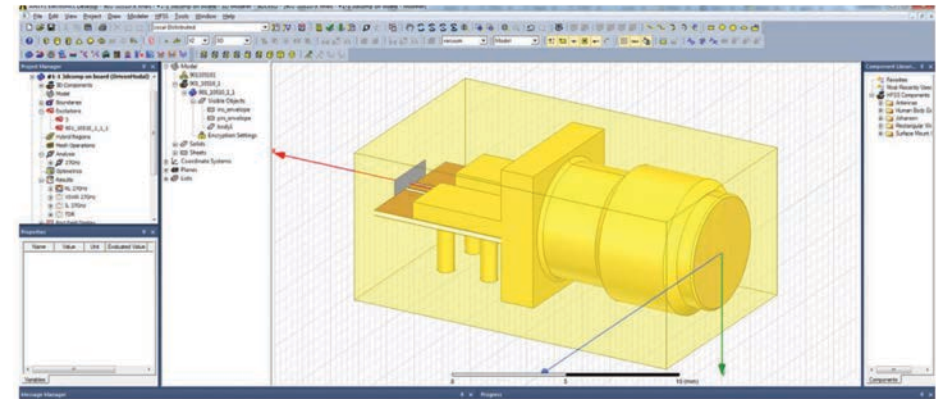
[1] http://www.etcs.ipfw.edu/~lin/CPET581-InternetOfThings/1-Lectures/2-5-2016-PaperPPT-slides/IoTResearchDirection_JS.pdf with her review being taken from the following source: A. Zanella, N. Bui, A. Castellani, L. Vangelista and M. Zorzi, 'Internet of Things for Smart Cities', IEEE Internet of Things Journal, vol. 1, no. 1, pp. 22-32, 2014.

Figure 1: Amphenol RF's ANSYS HFSS 3D component model is available for many of its range of connectors.

YouTube is said to be driving mobile video growth in Africa and is now considered to be the continent's top app. Other companies have also been helping to satisfy African appetites for mobile video content such as Netflix, Facebook and Nigeria's iROKO TV.

Quality *and* quantity

The challenge for MNOs to drive data revenues and manage subscriber Quality of Experience has never been greater. And yet MATT HALLIGAN says many operators are building out infrastructure based on an incomplete picture of the mobile data trends that are actually taking place.

As the old saying goes, 'You can't please all of the people all of the time…' Yet if you are a mobile operator, that is exactly what you need to do in order to prevent subscriber churn.

Of course, this task just keeps getting more difficult with mobile data traffic growing at a phenomenal rate. In fact, according to Cisco's latest *Visual Network Index* forecasts, mobile data is expected to rise at a CAGR of 65 per cent over the next five years in the Middle East and Africa. This is the strongest mobile data traffic growth of any region worldwide, and is followed by Asia Pacific at 49 per cent.

A key reason for this growth is the exploding popularity of mobile video. In 2017 alone, the number of new television serials being produced was roughly 500. What's more, it's estimated that 300,000 hours' worth of videos are uploaded online every minute. And all this video content is not being watched just on TVs or desktop PCs; increasingly, it is being streamed on smartphones and other mobile devices. It seems that mobile subscribers can't get enough *Netflix*, *Hulu* and *YouTube* content, not to mention Facebook videos.

This is compounded by the fact that, according to Openwave Mobility's Mobile Video Index, nearly 40 per cent of all mobile video traffic was HD last year requiring 3 to 4 times more bandwidth than standard video. This figure is likely to reach at least 50 per cent of total video traffic by the end of 2018, due to several factors:

◆ Greater dependence on smartphones as the primary device for viewing video
◆ A proliferation of new and more efficient codecs (i.e. VP9), and video hardware acceleration in mobile devices
◆ Bigger and higher quality displays and mobile camera
◆ Extensive social media sharing services

Of course, all this increased traffic load adds extra stress on today's already burdened mobile networks. Operators are struggling to cope as

some networks are stretched to the breaking point, resulting in subscribers experiencing buffering, stuttering and other video quality issues.

Unfortunately, customers don't have the patience for poor video performance. Our research shows they will only put up with six seconds of buffering, on average, before abandoning a video. This contributes to overall poor subscriber QoE, and the blame is typically placed squarely on the shoulders of mobile operators, not OTT content providers.

A world growing dim

In addition to an increasing volume of data traffic, mobile video content is also contributing to traffic management challenges related to poor network visibility. Operators are grappling with a sharp increase in the amount of traffic flowing through their networks that is encrypted. According to our index, as much as 75 per cent of all mobile traffic is now encrypted.

Much of this encrypted traffic growth is due to video content as OTT content providers strive to protect copyrighted material. In addition, Google's QUIC protocol has grown at a jaw-dropping rate of 284 per cent in just two years. (The search giant developed 'Quick UDP Internet Connections' as a transport layer that offered less latency compared to TCP.)

And with the need to secure customer e-commerce transactions, plus the new encryption protocol recently introduced by Facebook known as 'Zero Protocol' (0-RTT), the pace of encrypted traffic growth is not likely to slow down anytime soon. On the contrary.

What's more, there are additional factors that have not even impacted the mobile industry yet. For example, there's the continuing uptake of smart video-capable devices (even in developing markets), and the trend towards video as the default content type versus text and images (particularly for advertising). Based on these trends, our research indicates that the percentage of encrypted mobile traffic could reach 90 per cent by the end of this year.

The spread of all this encrypted content is effectively darkening the network, further complicating mobile operators' challenges to manage subscriber QoE. Operators cannot gain visibility into encrypted mobile traffic, which means they are unable to troubleshoot subscriber quality issues. According to our consumer surveys that were carried out independently towards the end of last year, subscribers find buffering and poor video quality to be even more frustrating than a dropped call. But if they cannot 'see' the traffic on their network, it is nearly impossible for operators to manage subscriber QoE, particularly with conventional mobile optimisation tools.

What's an operator to do?

Given the massive growth in mobile data (particularly encrypted OTT video content) and the network management difficulties that this

has created, one might wonder if operators have any options at all. Can they take proactive steps to address this growing issue? Or are they destined to be just 'dump pipes' and suffer subscriber churn due to poor QoE?

In order to stay one step ahead of OTT players, cellcos need the capability to make informed decisions about their networks. Success will be defined by how well they manage their data, and whether or not they can monetise their networks. Forward looking operators have started to fight back to take control of their networks and their subscribers.

Operators require technology that delivers insight into the precise type of data travelling on the network, even when the traffic is encrypted. With accurate video streaming analytics an operator can determine key factors about video traffic, enabling more effective troubleshooting. For example, is a video from Netflix, Amazon or YouTube? Is it standard definition at 480p resolution or Ultra HD? Is the video being live streamed or downloaded?

Determining the codec being used to deliver the video is also important, as this has a bearing on the bitrate at which the content is being delivered. Furthermore, a fundamental factor involved in troubleshooting user QoE is knowing the type of device to which the video is being delivered.

Gathering all of this crucial analysis is not only complicated by encryption, but also by a dramatic shift to the cloud, with an increasing amount of network traffic being delivered via network functions virtualisation (NFV). In fact, experts predict that 92 per cent of network traffic will be delivered via the cloud by 2020. This is where traffic management tools uniquely designed for encrypted cloud-based data traffic can make a crucial difference.

Conventional, appliance-based DPI and traffic management technologies were never designed for encrypted video streaming, and nor are they capable of spanning physical and virtual infrastructures. Operators need pure software solutions that manage streaming video. They need to look for platforms that are evolved to be agile, with heuristics designed for encrypted video and virtualised so they can be easily deployed in the cloud.

Additionally, operators require the flexibility to not just manage the encryption protocols of today, but to anticipate and manage future data traffic as well. Mobile operators will soon begin deploying 5G networks, which will consist of edge computing capabilities, virtualised elements, slicing platforms and centralised orchestration. In most cases, 5G will be implemented alongside legacy network technologies, further compounding management challenges and the need for complete visibility into traffic.

Money to burn

The sad fact is that while mobile operators are faced with the challenges of managing OTT encrypted content, the OTT content providers are busy raking in profits. Therefore, in addition to getting a handle on encrypted traffic

Matt Halligan, CTO & head of engineering, Openwave Mobility

management to optimise subscriber QoE, MNOs also need to find new ways to monetise data in order to grow revenues.

In saturated markets, the best and most likely path for revenue growth is by monetising mega-consumers of video. Once operators have solutions in place to better manage encrypted data traffic, they can implement a pricing plan that encourages these users to consume more video. In addition to these video mega-consumers, another likely target group are sports fans who are often the most dedicated video users. Thus, streaming of live events is another great opportunity for operators to generate new revenue.

Mobile video has already transformed viewing habits, with at least half of YouTube's 1.5 billion visitors accessing services on mobile. Netflix now has 100 million total subscribers across the world, many of which also watch content on mobile devices, while Amazon claims just over 76 million users for its *Prime Video* service. In Africa, companies such as Nigeria-based iROKO TV (which bills itself as "the Netflix of Africa"), as well as more established regional broadcasters such as MultiChoice, have already geared-up for the continent's growing appetite for video on the go.

It's not far-fetched to think that mobile video could soon overtake traditional television. Now is the time for mobile operators to find innovative ways to share in the revenue stream, rather than just being passive conduits for OTT content.

QoE is in the eye of the user

Ultimately, the subscriber will decide if the Quality of Experience with their current service provider is good enough, and poor QoE eventually leads to churn. Typically, the operator will not be aware that a subscriber is unhappy until it's too late. Measuring and tracking key user experience parameters for data services like mobile video is therefore critical.

Encrypted traffic flow is now the predominant form for data transfer. While some operators are still struggling with new encryption protocols that negate their ability to manage subscriber QoE, others are taking decisive action.

Furthermore, proactive next-generation planning requires agility and willingness to embrace change, both from an NFV perspective as well as with regard to value-added services. With appropriate network visibility and intelligence, today's mobile operators can take back control of their networks and their subscribers. If your customers are not 100 per cent satisfied with the QoE on your network, you shouldn't be either. ∎

MTN and Ericsson trial 5G in Africa

MTN and Ericsson are claiming a first in Africa with the trial of 5G technology and applications.

The demonstration took place at MTN's headquarters in Johannesburg in January 2018 following an MoU signed between the two companies at *AfricaCom* last November.

The trial was based on 5G prototype radios and commercially available baseband hardware, with 5G mobility supported. According to Ericsson, it saw throughput rates of more than 20Gbps with less than 5ms latency which is claimed to be the highest achieved on an African mobile network.

The vendor added that MTN has been assessing a range of 5G use cases and applications in its test lab proof of concept which is expected to lead to commercial deployment in the "near future". The two companies are also continuing to collaborate on identifying further use cases and applications for the digital transformation of industries such as mining, transportation, agriculture, manufacturing and utilities.

MTN SA CTIO Giovanni Chiarelli said 5G offers a whole new world of potential for South Africa and the continent. He said: "With 5G, remote healthcare through connected robots could offer world-class surgery in the most remote parts of the continent and the world. Self-driving cars could change the face of road safety, along with smart agriculture, smart mining, and smart cities."

Chiarelli added that while the technology will offer higher speeds and lower latencies, greater capacity is needed to achieve this. "Thus, once again we call on the government to urgently release the much-needed spectrum that is required in South Africa, to lower the cost of data and drive growth and development for all South Africans," he said.

OBS wins ICT contract for world's tallest building

Orange Business Services (OBS) has won a consulting contract to design the ICT infrastructure and smart services for the Jeddah Tower, currently being constructed by the Jeddah Economic Company in Jeddah, Saudi Arabia.

Due for completion in 2020, the tower will be the world's tallest building at 1km (3,281ft). Its 200 floors will include a 200-bed hotel, offices, flats and shops. Dubbed a "vertical city", it is located in Jeddah Economic City (JEC) 12 miles north of Jeddah and between Mecca and Madinah on the Red Sea coast.

JEC aims to become the sustainable new northern district of Jeddah

Planned for completion in 2020, the Jeddah Tower has a preliminary cost of SAR4.6bn (USD1.23 bn)

and the focus of economic growth along the coast, a destination for business, housing, tourism, leisure, entertainment, retail, medical centres and government offices and services.

OBS says it will make extensive use of digital technologies for smarter living and working. It will create a blueprint for the ICT infrastructure of the tower, from the plan and design, to the build and run phases.

The company is working on a number of major smart city projects in Saudi Arabia. They include the King Abdullah Financial District being built by the Al Ra'idah Investment company, which is the largest of four smart cities in Saudi Arabia being built with a collective investment of over USD70bn.

Orange has operated in the Middle East for more than 50 years and has offices in the main cities across the three provinces of Saudi Arabia – Riyadh, Jeddah and Dammam.

Airport introduces first cloud-based flight display system

Gatwick is said to have become the world's first major airport to introduce a cloud-based Flight Information Display System (FIDS).

While legacy FID systems require software to be loaded on a separate PC behind the screen to run them, Gatwick's 1,200 cloud-based screens now connect via a web browser from any operating system. It's claimed this takes up only 3Mbps of bandwidth which makes the new real-time system "extremely" fast and responsive to updates, a key benefit in times of disruption.

The new VisionAir FIDS was developed by AirportLabs and went live in mid-2017.

The system can run natively on smart TVs which is said to save on infrastructure and maintenance costs. It is also said to offer flexibility and can be run from a mobile device without the need for any software to be installed. Content can be managed collaboratively with other organisations, such as airlines and ground handlers, and different types of content can be hosted depending on requirements (disruption, weather, advertising, etc.).

Furthermore, unlike legacy FIDS,

Gatwick says its new system is more robust to network blips or power failures with mobile battery power and 4G backup available if required. It also includes a fully independent management interface that supports operation completely independent from any airport infrastructure or system if required.

The system also has awareness of screen positions with respect to the airport layout and can target appropriate messaging depending on the situation, and can control backlighting to help reduce energy consumption where possible.

"The solution we now have in place is resilient, flexible and low cost with highly optimised data transfer," says Gatwick CIO Cathal Corcoran. "We are transforming the way airport information is communicated and will soon allow passengers to interact with chatbots using Facebook Messenger, Whatsapp and other popular apps."

Corcoran adds that Gatwick is also exploring the use of the IoT for improving situational awareness and machine learning for accurately predicting flight departure times. Last year, the airport also became the world's first airport to deploy AR wayfinding.

The airport's 1,200 cloud-based screens now connect via a web browser from any operating system.

Police tackle city traffic thanks to hundreds of new radios

Milan's police service has been equipped with 1,750 new TETRA radios to aid road safety.

The radios were supplied by Hytera's German subsidiary Hytera Mobilfunk and its Italian partner Telecomunicazioni Professionali.

On the congested road network in the Milanese metropolitan area, tailbacks, accidents and traffic problems are said to be a continuous challenge. Hytera reports that officers of the Polizia Locale di Milano have their hands full controlling and monitoring the traffic, and that smooth, fast communication is critical to both ensure the safety of all road users as well as to be able to act quickly and effectively in the event of an incident.

The city police force has replaced all of its radio equipment with Hytera's TETRA portable and mobile digital radios. Handheld radios make up 1,350 of the new devices that have been supplied. This includes the lightweight and slim (23mm) *Z1p* that features 3W power, GPS, encryption, duplex calls and a man down feature. Hytera says the device complies with IP67 for resilience and that it continues to be operational after immersion in a metre of water for 30 minutes.

In the patrol vehicles, there are now 350 *MT680 Plus* mobile radios (*pictured above*). With 10W of transmit power, the device also offers group call, PSTN calls, emergency button and 16 programmable keys. Police motorcycles have also been equipped with new TETRA radios.

The new radios are said by Hytera to have passed their first major test when crowds were attracted by the Pope's visit to the city.

Viasat launches 'fastest' satellite internet service

Households in the US can now benefit from what is said to be the world's fastest satellite internet service, a claimed 100Mbps.

Viasat is offering unlimited plans at USD65-USD150 per month – after three-month discount deals – with unlimited VoIP calls to US and Canadian numbers at an additional USD29.99 per month.

The company, which uses its *ViaSat-2* satellite system for the service, offers free installation for a satellite dish, modem and router. In addition, Viasat says the service will be expanded to aircraft over North America, the Atlantic and western Europe as well as to business and government. And it says the planned launch of its *ViaSat-3* satellite – which is currently under construction – will offer a service to billions of people globally.

Viasat's chairman and CEO, Mark Dankberg, says the *ViaSat-2* service helps to bridge the digital divide in the US, giving customers new choices.

Features of the new offering include a home gateway with built-in Wi-Fi and two Gigabit Ethernet ports so that everyone in the building can connect wirelessly. It also has a phone port, eliminating the need for a separate ATA (analogue telephone adaptor).

Viasat says its future *ViaSat-3* system will offer global coverage with just three satellites. The first is expected to go into service in 2020 for the Americas, with the second – covering satellite for Europe, the Middle East and Africa – expected to launch about six months later. A third satellite is planned for the Asia Pacific region.

Peruvian villages go online for first time

Remote settlements in Peru have been connected with mobile broadband for the first time.

The deployment is a technology pilot and part of a project called *Internet Para Todos* developed by Telefonica with equipment from US company Parallel Wireless.

To keep costs down, the service uses mostly off-the-shelf components and open standards. They include a converged wireless system (CWS), a low power base station made with commonly-available components which integrates 3G and 4G access in the same form factor.

The pilot also features the *Parallel Wireless HetNet Gateway* (*HNG*) which is said to be a carrier-grade software platform that enables an open network architecture by using standard-based and open interfaces between network components to simplify network management and integration of new RAN products.

Parallel Wireless says the deployment used the full SDR capability of wireless open RAN technology to provide data and voice services over both 3G and 4G technology to thousands of clients.

It adds that the pilot has validated the maturity of these technologies to provide a cost-effective connectivity in low density areas, getting a voice growth of 12 per cent per month and Circuit Switch Fall Back (CSFB) success call rate of 99 per cent.

According to the vendor, intelligent packet processing delivered more than 10GB per settlement of daily 3G and 4G data traffic and each cell availability was 99 per cent.

Parallel Wireless also claims that the service, available globally and deployed on six continents, offers the lowest total cost of ownership to connect the unconnected.

Space weather global comms impact study

In what has been hailed as a world first, a new experiment to study the effects of space weather on global communications is being launched by the UK and US governments.

The Wideband Ionospheric Sounder CubeSat Experiment (WISCER) uses specially designed shoebox-sized satellites known as 'CubeSats'. These have been designed to help scientists study the Earth's upper atmosphere and find out how it impacts radio frequencies through space.

The project is being coordinated in the UK by the Defence Science and Technology Laboratory (DSTL), an executive agency sponsored by the Ministry of Defence. Dr. Mike O'Callaghan, space programme

The WISCER project uses shoebox-sized satellites known as CubeSats.
PHOTO: OXFORD SPACE SYSTEMS
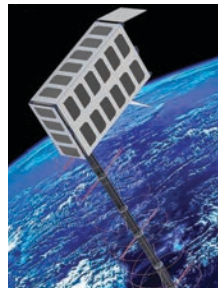
manager at the laboratory, said: "We're trying to find out how the ionosphere might affect us when we communicate. For example, are signals weaker during specific space weather conditions? It's important to understand the effects and how it might impact our communications around the world, specifically with military operations."

The WISCER project forms part of a joint programme with the US Naval Research Laboratory. Plans are now in place to launch two CubeSat satellites during 2020-21, each with a UK and a US payload.

The UK payload will contain a WISCER antenna and waveform generator that will transmit a signal to a bespoke ground signal receiver, assessing the impact of the ionosphere on the signal. The US payload will measure how electron density changes with altitude. The collaboration is said to offer the opportunity to generate data cost effectively, with both countries potentially sharing results.

In the UK, Thales Alenia Space has been awarded a GBP1.5m contract to build the WISCER payload and ground signal receiver.

5G launches in Qatar

In what it says is a world first, Ooredoo Group has launched 5G, initially for business customers, in its home country of Qatar. Using its 3.5GHz spectrum, the operator claims speeds of 2.3Gbps – twice that of the current 4G network – with 3.5ms latency. Ooredoo says the launch is part of its *Evolution to 5G* network modernisation programme, and that it plans to roll out the service across its global operations that include Southeast Asia, the Middle East and North Africa where it runs networks in Algeria and Tunisia.

New group for wireless

Two industry groups have combined in a bid to make radio networks more open, maximise the use of off-the-shelf hardware, minimising proprietary equipment, and specifying APIs, interfaces, and driving standards. The founding members of the Open Radio Access Network (ORAN) Alliance are AT&T, China Mobile, Deutsche Telekom, NTT Docomo and Orange. They say it will extend the efforts of the C-RAN Alliance and the xRAN Forum into a single operator led effort that will innovate quickly to meet expectations.

Free Wi-Fi on board

Passengers on board Finnlines' ships can now benefit from Wi-Fi thanks to equipment installed by Telenor Maritime. The connectivity platform includes 3G, Ka-band VSAT and mobile broadband backhaul in a bid to enhance the customer experience on board. Particular emphasis was put on covering areas such as cabins and other previously non-covered sections on the ship. The service is available on Finnlines' roll-on roll-off passenger vessels which operate between six ports in three countries. Kielo Vesikko, head of passenger services, line manager, says moving from a free to paid service was a "smooth" process.

Researchers simulate living conditions of Mars

Scientists have recently completed a four-day project in the harsh desert of southern Israel to simulate living conditions on Mars.

Six researchers occupied a mock space station powered by solar panels and linked to an off-base operations and control centre. The daily routine, food and communication was the same as it is expected to be during a real planetary mission, including wearing a space suit when venturing outside. They ate mostly freeze dried food and drank three litres of water per day.

Spacecom and the Desert Mars Analog Ramon Station (D-Mars) jointly carried out experiments in which

Aerial view of the Desert Mars Analog Ramon Station (D-Mars).

Spacecom's *AMOS-7* satellite provided the communication links. There were simulated blackout periods where, from Earth's perspective, Mars passes almost entirely behind the Sun.

The aim of the experiment – conducted with the Austrian Space Forum (OeWF) – was to test aspects of long range interplanetary space communications as well as examine challenges and issues that arise from manned planetary missions.

The site of the project, near the Ramon Crater, was chosen for its similarities to the surface of Mars, including its geology, aridity and isolation.

One of the participants, Guy Ron, a nuclear physics professor from the Hebrew University in Jerusalem, says: "D-Mars is half about the research, and the other half is about the outreach. A major part of this project is getting public interest and getting students interested in space."

Air Alliance offers 5G service from your seat

Airline passengers will be able to use their smartphones and tablets in the air as easily as they do on the ground, says a new non-profit industry group.

Called the Seamless Air Alliance and announced at Mobile World Congress in February, it aims to cut costs with working groups which will develop open standards for third-party manufacturers and for billing and deployment.

The five founders – who are

encouraging others to join – include US airline Delta, Airbus, Bharti Airtel, Sprint, and OneWeb. The latter has struck a deal for Airbus to build a fleet of low-Earth orbit communications satellites with the first set for launch later this year.

The alliance says that when the project is operational passengers' devices will seamlessly connect via satellite, through their current mobile operator, for 5G quality without the need for login or credit cards.

It says the goal is to create an improved passenger experience to enable the same level of connectivity they experience in their living room anywhere they fly. The alliance claims the project will also "significantly" reduce costs while creating a "smooth, positive user experience". It adds that the internet experience itself will be as good as, and in many cases better than, the home experience, including low latency, high speed, and a gate-to-gate continuity of service.

Vodafone introduces 4G mini mobile mast

Vodafone UK claims it has achieved an industry first with the successful trial of a new 4G mini mobile mast.

The operator said customers in the village of Porthcurno and on the local beach can now experience 4G data speeds of more than 200Mbps as well as a "strong" voice signal.

Situated on England's southern coast in the county of Cornwall, Porthcurno is significant in the history of telecoms as it served as a major international submarine cable station, and the beach was the landing point for Britain's first submarine telegraph cables in 1870.

Vodafone's telescopic mini mast is just eight metres high when extended to its tallest point, and is around half the height of the shortest standard mast. It can be painted to blend

in with its environment in Areas of Outstanding Natural Beauty.

Unlike other mobile masts, Vodafone said the mini mast does not require a large technology cabinet to house the power supply and electronics.

The mini mast is also said to be much quicker to install, taking around six months to become fully operational – that's around a third of the time it takes to install a standard mast, according to the company.

The mini mast has been introduced to address 'not-spots' and hard-to-reach coverage areas such as small villages and business parks.

A Vodafone spokesperson said that it uses the same output of power as a traditional mast for the actual radio equipment. But she added: "However, a mini mast has less such radio

equipment and is therefore more focused on a particular area, whilst a traditional mast may cover a larger range, with greater numbers of cells."
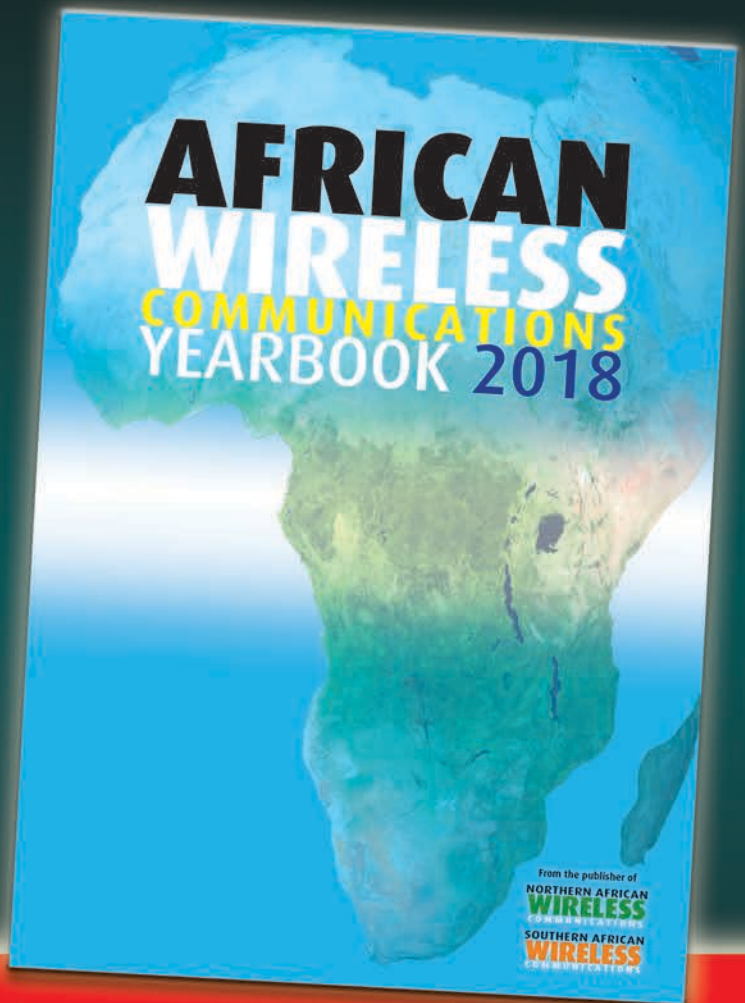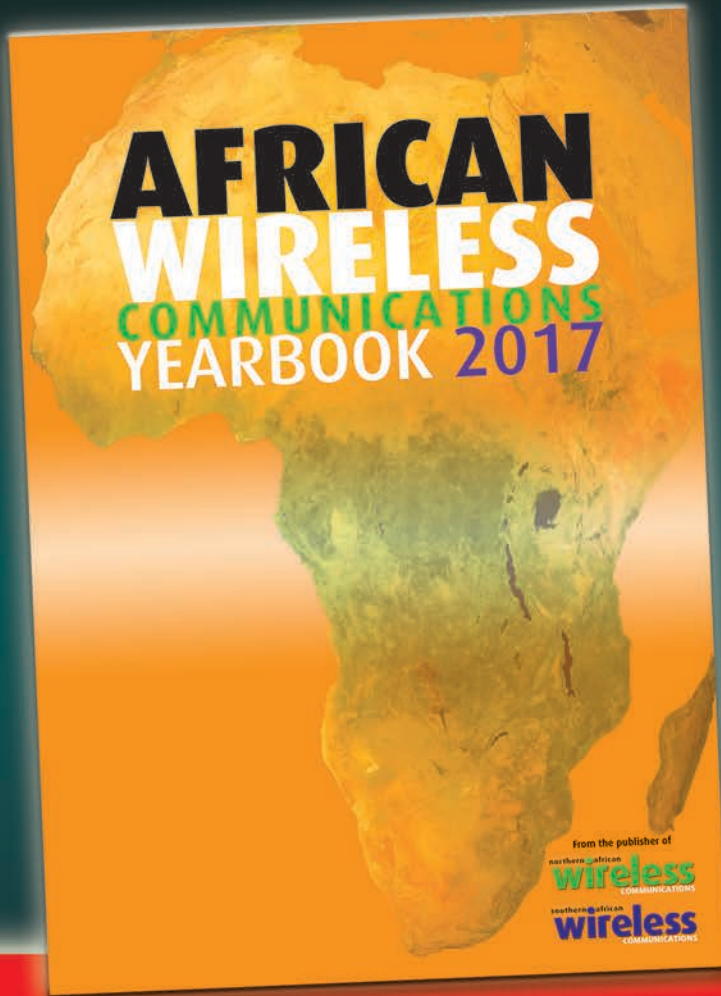
The spokesperson said it was difficult to specify the mini mast's actual reach as this very much depends on the local environment, geography, etc.

Vodafone said the mini mast was installed in ''significantly'' less time than full-sized versions.

East Africa Com

15 - 16 May 2018, Radisson Blu, Nairobi Upper Hill, Kenya

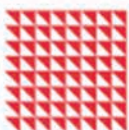## Connectivity champions unite: Bridging Africa's digital divide.

600 ENGAGED ATTENDEES

30 SOLUTIONS-FOCUSED EXHIBITORS

50 VISIONARY SPEAKERS

27% CXO LEVEL

> 66
>
> We saw a fabulous speaker line up – some of the biggest names in the industry and I made very useful contacts."
>
> Ishkhan Alexio Manyonde,
> Senior Engagement Manager
> Information & Analytics,
> Unilever