● **The IoT and getting on top of smart cities**

● **Using OSS/BSS to enhance crucial network functions**

● **Interview: Microsoft and its mission to empower Africa**

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KADIUM

Eutelsat launches Konnect Africa

Eutelsat has begun what it describes as its "bold ambitions" for broadband in sub-Sahara Africa with the launch of its much-vaunted *Konnect Africa* initiative.

On 6 June, the company launched services in Benin, Cameroon, Kenya, Lesotho, Nigeria, South Africa, Swaziland, Tanzania and Uganda. This followed an earlier announcement confirming that the *Konnect Africa* initiative was back on track thanks to a partnership with Yahsat *(see News, Feb-Mar 2017)*.

Eutelsat says it will deliver "innovative" services including packaged offers inspired by 'pay-as-

By working with local partners, Eutelsat hopes to accelerate satellite broadband connectivity across Africa.

you-go' models and Wi-Fi hotspots schemes. It says Wi-Fi hotspot access will be available for a "few cents" while family offers will be optimised

for a "few dozens" of dollars. High-grade enterprise services are also proposed to enable video-conferencing, storage, multimedia

content development, and safe and reliable communication.

Some of the first partners to support *Konnect Africa* include: AfrikaNet GoSat; Bentley Walker; China Telecom, which is establishing communication links between Africa and Asia-Pacific; Terrace Projects, a managed satellite service solution provider in South Africa; amongst others.

Eutelsat says it will give partners the means to succeed through dedicated commercial, marketing and technical support. The company adds that it will also train and reward local installers to enhance service quality and drive more talent into the industry.

Pan-African Wi-Fi roaming hub from Liquid Telecom

Liquid Telecom has introduced a new roaming hub that enables operators and ISPs to access its pan-continental network of public Wi-Fi hotspots for the first time.

The company says *Africa Wi-Fi Hub* will allow the customers of its wholesale clients to connect to hundreds of locations across Kenya, Rwanda, Uganda, Zambia and Zimbabwe, with additional markets to be rolled out soon.

Partners can connect to the hub through peering points in Eastern and Southern Africa, with the option to connect to hundreds of locations in one country, or join a global network of public Wi-Fi hotspots. The hub is also available as a white label service.

Liquid claims that by joining the hub, operators will be leveraging

Africa's largest independent fibre network.

It adds that they can also make their public Wi-Fi hotspots available to some of Liquid's Wi-Fi roaming partners.

This means that they will be able to take advantage of a global network of public Wi-Fi hotspots without the need to negotiate their own roaming agreements. Liquid's roaming partners currently include major Tier 1 carriers such as BT, as well as Wi-Fi network providers such as iPass.

"*Africa Wi-Fi Hub* is an important step in bringing together the region's Wi-Fi networks, reducing cost and complexity for operators and extending coverage for their subscribers," says Ben Roberts, group CTIO, Liquid Telecom.

DRC operator first to sign-up for Angolan satellite

DRC-based satellite operator Renatelsat has signed a deal to use capacity on *Angosat-1*, Angola's first communications satellite which is due to be launched in September 2017.

Renatelsat executive director Richard Achinda says *Angosat-1* will allow the expansion of his company's services in neighbouring countries as well as into Angola.

Renatelsat joins Angolan Public Television as one of the first two companies to sign for capacity on the USD320m satellite. The deals mark the official launch of the campaign to commercialise its capacity.

Angosat-1 will be operated by InfraSat which was established in 2008 as an independent business unit of Angola Telecom. InfraSat is responsible for the management of its entire portfolio of satellite services.

InfraSat executive director Diogo de Carvalho claims the new satellite is registering a lot of interest from national operators, and that there are ongoing contract negotiations.

According to Multichoice Angola's communication director, Adilson Garcia, *Angosat-1* will enable national operators to take advantage of satcoms services locally and in national currency – unlike providers from America and Europe where payment is made in foreign currency.

Following its successful launch from the Baikonur Cosmodrome, *Angosat-1* will orbit at 14.5ºE for an expected service life of 15 years. Its payload includes 22 C- and Ku-band transponders. InfraSat adds that it has a conventional capacity equivalent to 44 transponders of 36MHz which covers all of Africa and parts of Europe.

Safaricom introduces LTE-A in Kenya

Safaricom claims it is continuing to roll out Africa's "most advanced" mobile network following the introduction of 4G+ (LTE-A or 4.5G) services in major towns across Kenya.

In June, the operator announced that it had already activated 100 4G+ sites in Nairobi, Mombasa, Kisumu, as well as parts of Kisii, Naivasha, Kitui, Machakos, Kakamega and Kericho. More territories are scheduled to be switched on during the coming months.

Safaricom says the new LTE-A technology builds on the growing footprint of its 4G network which has gone live on more than 1,100 sites across the country. It also enables carrier aggregation, allowing subscribers to benefit from increased bandwidth accessible through the aggregation of different LTE spectrum bands.

The company says the 4G+ stations will supplement its existing

sites of which 4,677 are 2G, 3,517 are 3G and 1,103 are 4G. They will also complement its fibre rollout strategy that has so far seen more than 50,000 homes and 1,500 commercial buildings passed by high speed links.

"These faster speeds not only benefit the customer, they also empower small businesses who can now use the internet for more commercial activities – democratising data access," says Bob Collymore,

Safaricom CEO Bob Collymore reckons faster network speeds are "democratising data access".

CEO, Safaricom. "We expect that our network will empower more small enterprise to participate in commerce as well as drive more data use by critical sectors in the education, health and agricultural sectors."

More than a trillion shillings carried on Kenya's mobile money platforms

The use of mobile money for the payment of goods and services in Kenya hit KES627.4bn (USD6.03bn) during the first three months of 2017, according to the Communications Authority (CA) of Kenya.

In its sector statistics report for the first quarter, the authority said the volume of transactions on mobile money platforms were recorded at KES471.1m, with KES1.1 trillion moved during the period.

The CA said mobile commerce recorded a total of 290.5 million transactions. The number of mobile money subscriptions stood at 27.5 million, while the number of active mobile money transfer agents was registered at 174,018, a rise from 161,583 in the previous quarter.

The report forecasts that growth in online shopping could fuel the volume of parcels sent in the near future, and that the relative ease of shopping online will open up international commercial opportunities.

It added: "The telecoms sub-sector continues to be a critical element of the economy, laying the groundwork for greater investment in mobile money and as well as for ICT infrastructure growth."

The report also found that the number of mobile subscriptions increased during the first three months of 2017. The number stood at 39.1 million, up from the 38.9 million reported during the previous quarter (a 0.5 per cent increase).

However, SMS traffic declined compared to the previous quarter. 12.8 billion messages were sent during 1Q17, down from 15.2 billion sent during the previous quarter and representing a fall of 18.8 per cent. The CA attributed the

Safaricom is regarded as a pioneer of mobile money platforms, such as its *M-PESA 1 Tap Card.*

decline to the end of the busy festive season during which service providers had launched numerous special offers and promotions.

ATM taps PCCW Global for network services in Algeria

ATM Mobilis (formerly Algeria Telecom Mobile) will provide customers with access to PCCW Global's international connectivity, as well as a portfolio of managed services and UCaaS (unified communications-as-a-service) products.

Last year, ATM Mobilis signed a high capacity IPX interconnect agreement with PCCW. This has now been extended to cover services beyond traditional voice.

The two partners have also extended their combined MPLS network coverage. Their cooperation to establish an MPLS node in Algeria will help expand PCCW's global infrastructure into one of North and West Africa's key markets, whilst at the same time allowing ATM to

access PCCW's extensive worldwide network for its customers in Algeria.

Meanwhile in April, ATM launched *neTWin*, its new brand for the B2B solutions and services market. This includes PCCW's UCaaS products along with its managed network and security solutions.

Sameh Sobhy, VP of MENA, PCCW Global, believes it has become "critical" for operators serving mid-market or large enterprise customers to provide global UCaaS as part of their service portfolio.

He says: "Tapping into this next growth phase in cloud communications provides a significant revenue opportunity and is key to defending international customers from growing competition."

Service enables MNOs to expand 2G to remote areas

Intelsat has introduced a managed services platform to help mobile operators provide 2G services for remote populations throughout sub-Saharan Africa.

IntelsatOne Mobile Reach Solar 2G is a turnkey package that includes all satellite, cellular and power components. It integrates satellite services from Intelsat's globalised network with a backhaul terminal solution and network deployment expertise from Switzerland-based BCom. It also leverages Newtec's *Dialog* equipment.

The service will initially be available in sub-Saharan Africa, and Intelsat claims it can be rapidly deployed and is easily scalable to serve populations of all sizes.

BCom adds that the aim is to design a solution that fits each community with basic 2G GSM services, and covers a larger area or population based on a "pay-as-you-grow" model.

Patrick Elias, the company's sales and operations director, says: "With each community having its own specificity in terms of landscape and population density, the BCom backhaul terminal solution is designed to be flexible, scalable and resilient."

Intelsat reckons that now smaller and more portable kits can be used with its *EpicNG* platform, connecting remote and rural communities will become "easier and more cost-effective".

GiSat and JUPITER to bring broadband to millions

Hughes is supporting Global-IP's mission of bringing high-performance connectivity to mobile devices throughout sub-Sahara Africa.

Global-IP will use Hughes Network Systems' *JUPITER* platform to bring high-performance connectivity to mobile devices in sub-Saharan Africa.

JUPITER will be used to provide 100 per cent of the capacity on Global-IP's *GiSat-1* 150Gbps high-throughput satellite which is expected to enter service in 2019. It's claimed to be the first VSAT system to support DVB-S2X which is widely recognised as the most bandwidth-efficient standard available.

Hughes will supply 11 gateway stations in Europe using a centralised architecture for routing traffic in and out of the internet, as well as its *HT2500* and *HT2600* terminals. Beyond supporting high-quality Wi-Fi access, the company claims its "powerful" terminals are designed with LTE acceleration technology to meet MNOs' demanding requirements, making it economical for data delivery anywhere.

Due to be launched by SpaceX

during Q4 2018, *GiSat-1* is currently being built by Boeing (*see News, Dec 16-Jan 17*) and will be the first in a series of satellites from Global-IP. The company says its network will have multiple gateways located in Europe for connectivity to the internet via Tier 1 fibre backbones. It claims *GiSAT*'s advanced digital payload capabilities will allow the deployment of multiple in-country gateways and terminals for customers who wish to have local connectivity.

FG Wilson Keeping Kenya Connected

Kenya has seen a very positive economic environment in recent years, with growing investment in infrastructure, construction and telecommunications. Growth in all things digital has played a major part in this strong economic undercurrent.

The communications industry in Kenya say that almost 38.5 million accounts were active towards the end of 2016. People in Kenya are regularly using a mobile phone and just over 25.6 million people are online. It's a country of well-educated, tech-savvy people.

FG Wilson distributor Blackwood Hodge have been part of the Kenyan economic landscape since 1949, almost 70 years, with a pitch-side view of how the country has developed in that time. Since 1993, Blackwood Hodge have been an official distributor of FG Wilson branded generator sets, in a working relationship which dates back even further.

James Rowe from Blackwood Hodge says, "If you go back 10 or 12 years, our customers were almost entirely buying for commercial buildings, shops, offices, hotels and hospitals, and the generator sets were running for standby power and sometimes prime."

The same customers are there today but the scope of their needs has increased. James puts it down to the digital mindset which we all have today. He says, "In the past, if electric power was lost, many businesses could still function offline, at least for a short time. Now it's almost impossible. Businesses are just not prepared to take the risk of even short interruptions of electric power and that means much greater scrutiny of the generator set and how it's supported."

For telecoms and internet service operators, it's even more critical. These brands win and lose based on service uptime and their customers demand 100%. In May, James was with Blackwood Hodge at East Africa Com showcasing generator sets from FG Wilson specifically developed for telecoms operators.

Speaking of the FG Wilson telecoms range, James says, "The FG Wilson design team really got to grips with what telecoms operators need in a generator set. So they focused on operating costs and have been able to achieve extended running periods of up to 6 months between service and fuel replenishment intervals. The generator sets have 600, 1,000, or 2,000 litre fuel tanks and an extended service interval option.

Plus they bring in market-leading control modules, including built-in mains sensing and changeover systems. The range can be tailored to meet all technical requirements, from configurable alarms and protections, to remote monitoring, control and preventative maintenance. There's also a new range of acoustic enclosures at different sound attenuation levels which means you choose the enclosure you really need."

Support comes via Blackwood Hodge's experienced service team. James says, "We have the complete backing of the FG Wilson global parts organisation and our team has all the tools to carry out on-site diagnostics and maintenance so we make as few visits to sites as possible. And to make service simpler, we offer comprehensive service agreements which include four annual service visits, and these can be tailored for any support needs."

Blackwood Hodge are the authorised FG Wilson distributor for Kenya and Uganda, with offices in Nairobi and Kampala. To find out more about Blackwood Hodge and the FG Wilson range of generator sets, visit:

www.blackwoodhodge.com/
www.fgwilson.com

AAE-1 cable now ready for service

What's been described as the largest subsea cable system to launch in almost 15 years has now gone live.

Asia-Africa-Europe 1 (*AAE-1*) stretches 25,000km and is the first high-capacity cable system to link all of the major Southeast Asian nations to Africa and Europe via the Middle East. It connects Hong Kong, Vietnam, Cambodia, Thailand with Malaysia and Singapore, then onwards to Myanmar, India, Pakistan, Oman, UAE, Qatar, Yemen, Djibouti, Saudi Arabia, Egypt, Greece, Italy and France.

The system is said to deploy "state-of-the-art" 100Gbps transmission technology, with a minimum design capacity of 40Tbps.

Whilst *AAE-1* terminates at two POPs in Singapore, one unique feature is that it also continues further into Asia via diverse terrestrial routes across Thailand, connecting Vietnam, Cambodia and Hong Kong. As a result of transiting through these countries and avoiding the heavily congested Malacca Straits, it's claimed this routing enables the cable to have one of the lowest latencies between Hong Kong, India, the Middle East and Europe.

By connecting major carrier-neutral POPs in Hong Kong, Singapore and Marseilles, the consortium behind *AAE-1* says members can choose their preferred

The submarine system is said to follow a route similar to the 'Silk Road Economic Belt'.

backhaul providers available in these POPs or in landing stations in Asia, the Middle East, Africa or Europe.

Members of the cable consortium include China Unicom, CIL, Djibouti Telecom, Etisalat, GT5L, Mobily, Omantel, Ooredoo, OTEG, PCCW Global, PTCL, Reliance Jio, Retelit, Telecom Egypt, TeleYemen, TOT, Viettel, VNPT and VTC.

Partners go OTT to deliver streaming video content

Falcon Media House (FMH) has joined forces with Media Nucleus and Quiptel to offer an OTT service to millions of users in Africa and Asia.

The partnership enables FMH – a UK-based global digital media group – to offer an OTT platform to medium and large sized broadcasters, as well as parts of its content portfolio to local content service providers.

Media Nucleus specialises in broadcast and pay TV solutions, and its clients include East African satellite broadcaster Zuku TV.

It will use FMH's *Q-Flow* technology to enable customers to experience high quality video streaming. It's claimed this overcomes the challenges of

congested and slow connections to deliver content to the end user using the most efficient and cost effective route. FMH reckons this results in "seamless streaming over even the most challenging networks and mobile conditions".

The two companies will work with Chinese business-to-business OTT platform provider, Quiptel. It will integrate with Media Nucleus' subscriber management software to provide billing solutions to customers.

The partners add that their joint solution will enable broadcasters and cable companies to increase their market share with lower capex, as they will not need to invest in hardware and lay new network cables.

Mobile data traffic to reach 7.4EB per month

Mobile data traffic will grow 12-fold from 2016 to 2021 in Africa and the Middle East, according to Cisco.

In its latest annual *Visual Network Index* (*VNI*) released in June, the firm forecasts that mobile data traffic in the region will rise from 610.3PB per month in 2016 to 7.4EB per month by 2021.

Cisco says business mobile data traffic in MEA grew 79 per cent in 2016. It predicts this will grow at a CAGR of 52 per cent to hit 493.9PB per month by 2021, up from 60.7PB per month in 2016.

The *VNI* reveals that the average mobile connection speed in the region was 3,778kbps in 2016. It says this will increase 2.9-fold, reaching 10,784kbps by 2021.

In terms of network connections, the index says there were 1,330 million mobile-connected devices in MEA last year. Fifty-nine million net new devices and connections were added to the mobile network during the period. The *VNI* forecasts the number of mobile-connected devices to grow at a CAGR of six per cent over the next four years, and says there will be 1,814 million by 2021.

The number of mobile-connected M2M modules rose by 33 per cent to 55 million in 2016. Cisco expects this number to quadruple between 2016 and 2021 to reach 223 million, with M2M traffic predicted to account for two per cent of total mobile data traffic by 2021 compared to one per cent at the end of 2016.

MainOne to keep African internet traffic in Africa

MainOne is aiming to become West Africa's largest internet hub with a new interconnect service for carriers, enterprises and ISPs.

The launch of *Open-Connect* follows the partnership of MainOne's data centre company MDXi with the Nigerian Internet Exchange (IXPN) to improve national transit traffic. It's claimed the new

service will allow co-located customers to connect to multiple networks while "significantly reducing" the cost of backhaul links to various providers.

MainOne reckons *Open-Connect* "guarantees the best cross connect services in Nigeria", enabling customers to bypass the public internet and connect directly to partners, cloud and SaaS providers with secure, reliable and flexible direct connections.

CEO Funke Opeke (*pictured*) says the solution will enable more operators and carriers to take advantage of IXPN's connections in MDXi's data centre, and means internet traffic originating and terminating on any network in Nigeria can remain in-country.

She adds: "This new interconnection service for customers will significantly improve traffic growth and localisation in Nigeria, with reduced latency, improved speed and better quality of services to end users."

MDXi is said to run Africa's only Tier III data centre (*see News, Oct-Nov 2016 issue*). Based in Lekki, the facility is directly connected to MainOne's 1.92Tbps submarine cable.

With connections to IXPs in Lagos, Amsterdam, London and Ghana, and more than 50 POP locations across West Africa, MainOne claims it enables carriers, ISPs, content providers and enterprises of all sizes to grow their network footprint without investing heavily in additional infrastructure.
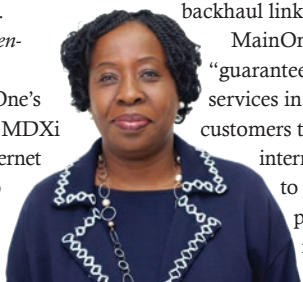
Delivering voice growth through a unique mix of wholesale & retail

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

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

The African opportunity

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

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

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

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

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

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

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

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

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

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

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

continue to provide customers with value across both communication and financial services.

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

Twice the opportunity

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

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

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

Strategic partnerships: the key to growth

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

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

idtvoice.com
idtcarrierservices.com/twice

Chris Godfrey, executive director, Qwickfone

ON THE NETWORK

Africa's mobile boom has peaked

All the signs indicate that the incredible growth of mobile telephony in Africa has hit a wall. The boom is bust and the peak has been reached. Growth has been in decline for the past two years and is rapidly heading towards zero.

There are five major obstacles to further mobile growth in Africa: the inefficiency and outdated nature of the power supply needed to run networks; the inability to maintain networks due to the lack of forex required to purchase equipment from abroad; the short-sighted competition between telcos that keeps coverage concentrated in urban areas and not remote villages; inefficient patchy network coverage (even in densely populated cities); and a lack of spectrum due to government reluctance to convert to digital broadcasting.

What Africa needs in order to reach the target of one billion people connected by 2020 is a cheap, robust and entirely self-sufficient network. This is why we developed Qwickfone: a low-cost, solar powered technology that forms a local network to connect a village to the world via satellite or long distance Wi-Fi. Our goal is to install a mobile network in every unserved and disconnected community in the world, starting with trials in Kenya, DRC, Malawi and Zambia beginning in the final quarter of 2017.

To make this a truly viable solution for millions of unconnected people, we will provide a free handset for everyone who wants network access. This should start to address basic human needs, such as better access to healthcare, education and finance.

Our dream is to make a difference to the lives of millions of people across the world by connecting them to each other.

Y'ello Box brings reliable power via mobile phones

In what's claimed to be a world first, a new solar electricity service is being pioneered in Nigeria.

Designed and operated by Abuja-based Lumos Mobile Electricity Service, the *Y'ello Box* was launched earlier this year and provides solar electricity which consumers pay for using their MTN mobiles.

Customers can sign-up for the service at their local MTN shop. After paying a one-off fee, they receive a kit that comprises a large 80W solar panel and cable, an eight-socket power unit, USB mobile phone adapter, and two LED lights.

An "easy" self-installation kit enables users to mount the solar panel on the roof and connect it to the indoor power unit. They can then access electricity from the unit by making a payment via their mobile airtime. Once the payment has been credited, the service unlocks and customers can access electricity 24 hours a day.

Lumos says the *Y'ello Box* is already benefitting more than one hundred thousand people in homes, clinics, schools and businesses across Nigeria.

"The *Y'ello Box* saves customers money all while providing better and more reliable electricity," says Lumos

Thousands of people are said to be using the system in Nigeria to run lights, watch TV, etc.

CEO Yuri Tsitrinbaum. "It's time we did more to harness the power of the sun. That is why the *Y'ello Box* is changing so many lives. It is affordable, it is reliable, and paying by mobile phone makes it easy."

Linking firms and customers with A2P SMS

Algerian operator Icosnet has introduced an A2P SMS service for domestic and international companies who want to communicate directly with their customers across the country.

Businesses in Algeria are said to be increasingly turning to text messaging to connect with their customers as it has a greater chance of being successfully received and read than email.

Icosnet is rolling out its new A2P messaging service with the help of Belgium-based communications specialist, World Telecom Labs (WTL).

Initially, the company helped Icosnet establish its service quickly through the provision of SS7 signalling gateways. But as its business expanded and evolved, WTL provided a variety of equipment, including its VoIP switches. The new A2P service will run over the existing WTL platform that was developed to support both VoIP and SMS services. An IP interface connects Icosnet to the platform which then switches and routes messages to the right operator in what's claimed to be an "efficient, cost-effective way ensuring the best possible delivery success".

WTL adds that its platform also enables Icosnet to accurately bill clients for the number of messages sent.

Sudatel Telecom Group joins GSMA's Humanitarian Connectivity Charter

Sudatel Telecom Group (STG) has joined the GSMA's Humanitarian Connectivity Charter.

Launched in 2015, the charter is supported by 112 mobile operators spanning 77 countries. The aim is to bring the telecoms industry together to provide connectivity during wars, famine and natural disasters. Other MNOs in the region who have signed the charter include Airtel, Millicom, Etisalat, Ooredoo and Zain.

Given Sudan's geographic location, STG says it will continue to play a strategic role in connecting Africa and the Middle East to the rest of the world. "We are operational across Northern and Western Africa where unfortunately crises are frequent," says

STG CEO Tarig Hamza Zainelabdin. "We will continue to aim to keep our networks up and running in the most adverse of conditions as we know that connectivity is a lifeline for those affected."

As well as providing mobile and fixed networks across North and West Africa, STG also offers wholesale services to international carriers. It has built a fibre network across Sudan, Senegal, Mauritania, Guinea Conakry, Chad and Ethiopia, and also has interests in several submarine cable systems including *SAS 1* and *SAS 2* (*Saudi Arabia Sudan*), *ACE*, and *EASsy*.

Additionally, it owns 75 per cent of Dubai-based Expresso Telecom Group which provides mobile

and digital services in Senegal, Mauritania and Guinea Conakry.

SDT is more than 60 per cent government-owned and is the first Sudanese company to have been listed on regional stock exchanges.

CEO Tarig Hamza Zainelabdin says the company will endeavour to keep its networks running in the "most adverse" of conditions.

Linking Mastercard with mobile wallets

MatchMove will provide Youtap's customers in Africa and Asia with an off-the-shelf payment acceptance solution for mobile money wallets.

Founded in New Zealand in 2007, Youtap is a global provider of contactless mobile money payments and financial services software. Airtel and MTN are listed as among the MNOs in Africa that use *Youtap Pay*, its mobile money payment processing platform.

The firm has integrated MatchMove's secure mobile wallet solutions with its platform for the acquisition, processing and settlement of credit, debit and pre-paid cards linked to a mobile money wallet.

The companies say their partnership follows growing global demand for Mastercard companion cards connected with mobile money accounts.

They say their combined solution will enable MNOs to issue Mastercard companion cards to their customers. Cards can be branded and integrated with the cellco's current mobile wallet app and enable users to buy products online and in stores.

Shailesh Naik, CEO of Singapore-headquartered MatchMove, says: "Our partnership with Youtap will expand the availability of our secure
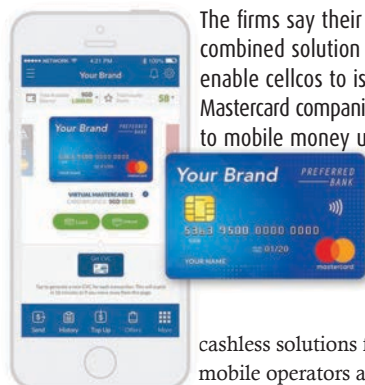
The firms say their combined solution will enable cellcos to issue Mastercard companion cards to mobile money users.

cashless solutions for mobile operators around the world, thus creating a new channel to bridge the gap between mobile money and end users."

As well as offices in Asia and the US, MatchMove plans to open new premises in South Africa and Dubai to support its global growth.

Microsoft cloud services for Africa

Microsoft plans to deliver its complete range of cloud services for the first time from data centres in Africa.

The company will offer products such as *Azure*, *Office 365* and *Dynamics 365* from its own facilities in Johannesburg and Cape Town with initial availability anticipated in 2018.

According to Microsoft, many companies in Africa currently rely on cloud services delivered from outside of the continent. It claims its investment will provide highly available, scalable,

and secure cloud services across the continent with the option of data residency in South Africa.

Scott Guthrie, EVP, cloud and enterprise group, Microsoft Corp, says: "With cloud services ranging from intelligent collaboration to predictive analytics, the *Microsoft Cloud* delivered from Africa will enable developers to build new and innovative apps, customers to transform their businesses, and governments to better serve the needs of their citizens."

Microsoft claims it has helped to bring 728,000 SMEs online across the continent and supported them to transform and modernise their businesses. The firm adds that more than 500,000 firms are now utilising its cloud services, with 17,000 using the *4Afrika* hub to promote and grow their businesses.

In addition, its says the *Microsoft Cloud* is helping Africans build job skills, with 775,000 trained on subjects ranging from digital literacy to software development.

SES to provide connectivity in Burkina Faso

SES has been selected to lead a project to extend high-speed communications infrastructure throughout Burkina Faso.

The satellite operator will provide the full end-to-end solution – including wireless terrestrial communication and integration with the available optical fibre backbone – to connect 881 sites for nationwide e-government, education and health services.

In order to enhance connectivity in the landlocked country, SES will use satellite capacity via its medium Earth orbit fleet which was previously run by O3b Networks but is now 100 per cent owned by SES. The company will provide managed service and maintenance support from Luxembourg and via a local presence in Burkina Faso.

SES will provide managed service and maintenance support through a local presence in Burkina Faso as well as from its facilities in Luxembourg (left).
PHOTO: BUSINESS WIRE

The terrestrial wireless part of the network will be operated by Burkina Faso's National Agency for Promotion of Information and Communication Technology.

SES says the combination of terrestrial and satellite links provides an "optimal" solution, empowering network reliability and increasing IP throughput.

SES' solution is specifically designed for the Support Programme of the

Reinforcement of Communication Infrastructures (PARICOM). This underpins Burkina Faso's e-governance policy through a Luxembourg development cooperation project which is part of the Indicative Cooperation Programme.

The initiative's aim is to improve the quality, reliability and accessibility of ICT infrastructure throughout Burkina Faso over 2017-2021.

Intelsat 35e launched

Intelsat has launched the fourth of its *EpicNG* high throughput satellites. *Intelsat 35e* left Earth on board a *Falcon 9* on 5 July and will orbit at 325.5°E where it replaces *Intelsat 903* which will be redeployed by year-end. The new satellite will deliver C- and Ku-band services for wireless infrastructure, mobility, broadband, government and media customers in the Americas, Caribbean, Europe and Africa. Orange, INWI, Sonatel and Speedcast are named as among some of the first customers who will deploy services once the satellite goes live.

ABS supports DTH platform

ABS and Telcom Satellites TV (TSTV) have signed a multi-transponder agreement for the delivery of DTH broadcast services into Nigeria. The new platform was due to be launched in July and is ultimately expected to air around 150 TV channels. TSTV will use *ABS-3A* which orbits at 3°W. According to ABS, its wide Ku-band beam offers new possibilities for video distribution across Africa as well as MENA, Europe and the Americas.

NCA must stay focused

Ghana's communications minister has called upon the new directors appointed to the National Communications Authority (NCA) to meet the challenges in creating a "robust and secure" information and knowledge society. Speaking at the inauguration ceremony in early July, Ursula Owusu-Ekuful said the NCA had to work with all stakeholders for the continuing development of ICT infrastructure and services, and in the spirit of public-private partnership. She urged board members to use their expertise to "enrich" the strategic decision-making process, and guide the management of the NCA to deliver on initiatives.

Boost your Business with Fixed Wireless Broadband and Wi-Fi

Wi-Fi is a critical component of creating the fabric for a fixed wireless broadband network. There's just one problem: how to get Wi-Fi where you need it. The solution doesn't have to be difficult or expensive – as long as you make the right choices.

Do I have to dig a trench?

The most common problem with getting Wi-Fi to new locations isn't the Wi-Fi itself – it's the connection from your router back to the internet. Extending that cabling to where you need Wi-Fi access can be very expensive and often impossible if you need to cross large outdoor spaces or someone else's property.

If it's an outdoor space or remote building, chances are that your ISP won't offer coverage there either. Even if they're willing to, you'll be stuck with the costs for them to lay cable, install equipment and then a monthly fee thereafter.

Wireless backhaul and Wi-Fi

The leading technology to resolve this issue over long distances with high bandwidth and high reliability is wireless backhaul, provided by ePMP or PMP solutions from Cambium Networks. Operating in licensed bands and at 5 GHz, it operates like a wireless network cable.

A point-to-point wireless backhaul link is made up of two radio units, each with a standard RJ45 Ethernet port. To create Wi-Fi access, install one radio unit at the Wi-Fi router and the other at the internet source. After a short alignment process to get the best signal, you can easily achieve speeds up to 200 Mbp/s, with no monthly fees or expensive cable runs.

Network integration

Integrating wireless backhaul with your existing network is easy. At its simplest, a wireless distribution network works as a transparent bridge, so data coming in one end of the wireless link leaves the other. This gives IT full, transparent management remote access to the router (and the distribution network) from the office.

If more advanced configurations are needed, such as NAT and QoS, these can be configured directly on the distribution network, without the need for a dedicated router to handle the functions in every location.

Security

Every piece of data transmitted and received across the link is encrypted with AES-128, and none of it is stored on either radio unit. The IT department can handle firewall rules, access control and other security issues just as they would for Wi-Fi inside the enterprise.

Proven solutions with leading spectral efficiency

With more than 7 million wireless broadband modules deployed in 150 countries, Cambium Networks has specific experience in developing solutions for industrial, enterprise and service provider network operators. Our solutions provide the highest amount of usable throughput in the smallest amount of RF spectrum.

Where do I start?

• Check out the stories and discussions among network operators on our online community, or view one of the webinars and our case studies

• Design your own solution with our free LINKPlanner software. See a detailed model of your solution, make adjustments and tailor the network to meet your exact needs

• Contact Cambium Networks and one of our local representatives will work with you to design and build your network

solutions@cambiumnetworks.com
**www.cambiumnetworks.com/NAWC**

Spam calls "big business" in Africa

Five African countries are among the top 20 affected by the growing number of spam calls, according to Truecaller.

India, the USA and Brazil top the list with phone users in those countries receiving more than 20 average spam calls each per month. South Africa came in at number five with an average of 15 spam calls per user per month, followed by Nigeria at number nine with 10.4 calls and Egypt at 10 with 9.9 calls. Morocco and Kenya occupy the bottom with an average 7.7 spam calls received per user per month.

Truecaller provides a suite of phone services including one that enables users to see all caller IDs, block calls as well as texts, and report spam callers and messages.

For its study, the Sweden-based company aggregated data anonymously from incoming calls that had been marked as spam from January to May 2017. During this period, Truecaller says its worldwide users received more than 5.5 billion spam calls.
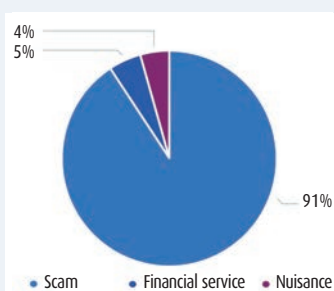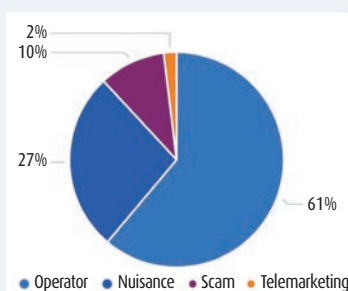

Left: Scam callers are a major problem in Kenya. **Right:** in Nigeria, operators were responsible for most of the reported unsolicited calls.
SOURCE: TRUECALLER INSIGHTS: TOP 20 COUNTRIES AFFECTED BY SPAM CALLS IN 2017

Globally, the company says there are common categories that link all such calls together. Some of the most common ones it identifies include local scams, telemarketing and debt collection calls, and unsolicited finance and insurance product offerings.

In Kenya, the research revealed that scammers made up 91 per cent of the reported spam calls. The rest were made up by financial services such as banking product offers, unsolicited credit union offers, or cold calling by credit card companies.

Nigeria also has an issue with scam calls, but unlike Kenya this was smaller at 10 per cent of all reported spam calls.

Truecaller says one major problem in Nigeria are spam calls from operators; these amount to the majority (61 per cent) of the total that are reported. During these type of calls, it says call centre agents attempt to upsell data plans or push promotional offers.

Nuisance calls present a further problem for users in the country. Accounting for 27 per cent, these are generally unwanted and unsolicited calls that are a disturbance for users, or at the very least amount to prank calls and at worst, harassment.

Rounding off the spam call list in Nigeria are telemarketers at two per cent. These could be promotional calls from companies, surveys, political or automated calls, or new client outreach for services and subscriptions.

According to Truecaller, spam is "big business" in South Africa. The country's direct marketing industry reportedly employs more than 150,000 workers, with the average call centre agent logging around 1,600 calls on a monthly basis. The company says this amounts to phone users in South Africa being collectively bombarded by tens of thousands of spam calls every day, with telemarketing leading the way at 39 per cent. Only one per cent of local calls in the country were marked as scams.

Turmoil for Etisalat in Nigeria

Etisalat Nigeria has reportedly been re-branded as '9Mobile' amid disputes about its ownership and financial difficulties.

Abu-Dhabi-based Etisalat Group owns a 45 per cent stake and 25 per cent preference shares in Emerging Markets Telecommunication Services (EMTS) which traded as Etisalat Nigeria.

According to some reports published by local outlets in mid-July, Etisalat gave EMTS a three-week ultimatum to stop using the Etisalat brand for its business in Nigeria. This followed the collapse of negotiations between Etisalat Nigeria and its lenders that comprise 13 local banks.

In 2013, these banks loaned Etisalat USD1.2bn for a network upgrade and expansion. But according to reports, the operator has told its creditors that it is unable to make any further repayments without raising further funds, blaming economic recession and the devaluation of the naira.

The banks rejected Etisalat's argument and threatened to take over its local operation. This prompted the Nigeria Communications Commission (NCC) to convince subscribers of Etisalat's "network integrity". In a statement issued on 20 June it said:

"The NCC wishes to reassure the over 21 million Etisalat subscribers that it will do all within its regulatory power to ensure that [they] continue to enjoy the services provided by the operator.

"The commission has taken proactive steps to cushion the impact of the takeover, this is without prejudice to the ongoing effort between Etisalat and the banks toward negotiated settlement."

The NCC continued by reminding the banks of the Nigerian Communications Act 2003. This states that a license is personal to the holder and cannot be operated by, assigned, sub-licensed or transferred to another party without the commission's prior written approval.

In conjunction with the Central Bank of Nigeria, the NCC mediated by holding several meetings with the banks, Etisalat and other stakeholders with a view to finding a resolution. However, talks between all parties ultimately collapsed, leading to the Emirates Telecoms Group walking away from the negotiations and the resignation of its board and management staff.

On 10 July, EMTS issued a press release stating that it has a "valid and subsisting" agreement with the Etisalat Group which entitles it to use the Etisalat brand. It said that discussions pertaining to the continued use of the name were ongoing between the two companies. It added: "The final outcome on the use of the brand in no way affects the operations of the business as our full range of services remain available to our customers."

A few days later, EMTS introduced '9Mobile' as the new brand identity for its operations.

Intelsat-OneWeb merger collapses

Intelsat has terminated its proposed merger with OneWeb.

The combination of the two companies was announced earlier this year in a share-for-share deal *(see Wireless Business, Feb-Mar 2017 issue)*. But on 1 June, Intelsat said that following the expiration of the deal on the previous day, the minimum tender conditions for the exchange offers and consent solicitations had not been satisfied.

A company press statement said: "The Issuers have not accepted any of the Existing Notes for exchange; any Existing Notes tendered for exchange will be promptly returned to holders, and the Exchange Offers and Consent Solicitations have accordingly been terminated."

According to Intelsat CEO Stephen Spengler, there were many stakeholders' interests that needed to be satisfied in the "complex" transaction, and bondholders were unwilling to accept the terms of the exchange offers presented.

Japan's SoftBank Group owns 40 per cent of OneWeb and had agreed to make a cash investment of USD1.7bn in exchange for common and preferred shares of the combined company. But although this is now off, Spengler said the pre-existing commercial agreement between SoftBank, Intelsat and OneWeb will still continue.

"Under this agreement, we plan to jointly develop integrated solutions utilising both of our fleets and to act as a sub-distributor to SoftBank for the attractive application segments of mobility, energy, government, and connected car," said Spengler. "As we create integrated services for these applications, we expect to accelerate and enhance our goal of unlocking new and larger opportunities in the communications landscape."

NSR sees huge future for satellite-based mobile backhaul

Cellular backhaul is expected to be one of the fundamental growth pillars in the satellite industry, according to Northern Sky Research (NSR).

In its latest *Wireless Backhaul via Satellite* report published in early June, the analyst says the days of satellite being a "last resort" for USO with "negligible" returns for MNOs are now gone.

NSR expects satellite backhaul to generate large global growth opportunities in the next 10 years. It forecasts growth at double-digit CAGRs with more than 110,000 units installed by 2026.

The firm believes the arrival of HTS together with advanced ground segment is making satellite a viable option for backhauling 3G and 4G base stations.

"Looking forward, the majority of new opportunities will be generated from 3G and 4G/LTE deployments,"
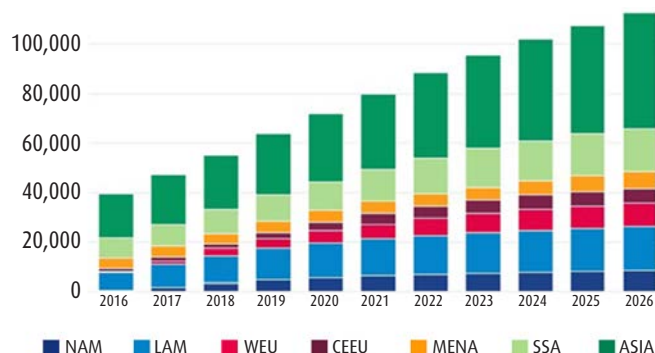
Satellite-based cellular backhaul in-service units.   SOURCE: NSR

writes NSR analyst Lluc Palerm-Serra. "2016 marked a key milestone in this transition. For the first time, 3G global data traffic surpassed 2G demand despite the latter still comprising 65 per cent of the installed base."

NSR adds that broadband is taking over even in less developed markets like Africa where many new deals progressively include a 3G footprint. It predicts that the shift will be nearly complete by 2026 as more than 90 per

cent of the installed satellite base will service broadband sites.

But the firm warns that price per Mbps is critical to facilitating broadband services. "The efficiency at which the system transforms MHz into Mbps has an obvious impact in this equation," says Palerm-Serra. "Satellite power, ground segment design, modem and other elements all have their roles to play in end-to-end system efficiency."

E-government services in Senegal boost GDP
The impact of digital technology as a wealth creator in Africa is such that some countries like Senegal outperform many Western countries in the contribution of new technologies to GDP.

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
11/5/17	Ahmad Farroukh	Smile Telecoms	Executive director, operations	Mobily	CEO
26/5/17	Kyle Whitehill	Neotel	CEO	Vodafone Qatar	CEO
1/6/17	Arnaud de Puyfontaine	Telecom Italia	Executive chairman	Vivendi	Chief executive. Vivendi owns a 24% shareholding in Telecom Italia.
13/6/17	Tarik Zilate	Neural Technologies	EMEA business development manager	Roscom	Business development manager
30/6/17	Gregory Lee	Nokia	Head, Nokia technologies	Samsung Electronics North America	President & CEO
30/6/17	José Manuel do Rosário Toscano	Intelsat	Head of international government affairs & asset management,	International Telecommunications Satellite Organisation	Director general & CEO
3/7/27	Godfrey Sserwamukoko	iWayAfrica Uganda	MD	iWayAfrica Uganda	Acting head of business
4/7/17	Dirk Karl	MTN Group	Procurement & supply chain head	BuyIn	SVP for network technology. BuyIn is the procurement JV between Deutsche Telekom & Orange.
18/7/17	Jean-Philippe Gillet	Intelsat	VP & GM of broadband	Intelsat	VP EMEA
18/7/17	Mark Rasmussen	Intelsat	VP & GM of mobility	Intelsat	VP Americas
18/7/17	Robert Cerbone	Intelsat	VP & GM of media	Time Warner Cable	VP & GM for wireless products
21/7/17	Tony Gray	TCCA	CEO	Regional business director	P3 Group
21/7/17	Phil Kidner	–	–	TCCA	CEO; retiring as of September 2017

INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
22/5/17	VEON	Sberbank	Loan	RUB110bn	The five-year agreement will refinance existing loans between Sberbank & VEON's subsidiary, VimpelCom Holdings, as well as provide additional funds for general purposes.
26/5/17	Hytera Communications	Sepura Group	Acquisition	GBP74m (reported)	Hytera has now completed its acquisition of Sepura. It's added around 700 staff to its organisation & expanded its European operations with innovation centres in the UK & Spain. Hytera founder & president Qingzhou Chen said: "With enhanced capabilities, we can better serve local markets & help to address increasing security challenges in Europe."
30/5/17	Cevian Capital	Ericsson	5.6% stake	USD1bn	Said to be one of Europe's largest activist investors, Cevian Capital is now Ericsson's third-largest shareholder, but is likely to raise its position to be come the biggest, according to some reports. Cevian co-founder Christer Gardell has blamed Ericsson's board for doing "a very poor job" and is looking for people with greater industry experience.
22/6/17	Globetouch Inc.	Teramatrix	Acquisition	NA	Globetouch will integrate Teramatrix's *xFusion* platform to create IoT applications that support connected cars, autonomous driving, predictive maintenance & edge intelligence.
7/7/17	Liquid Telecoms Financing	Debt capital markets & banks	Bond & term loan financing package	UD700m	Liquid Telecom's financing arm has raised USD550m in the international debt capital markets in its debut bond, in addition to a USD150m term loan. The notes will bear an interest rate of 8.5% p.a. Funding will enable Liquid to further expand & enhance its pan-African fibre network.
12/7/17	CommScope	Cable Exchange	Acquisition	NA	US-based Cable Exchange manufactures a variety of fibre & copper cables, trunks & related products used in high-capacity data centres and other enterprise applications.

That's according to France-based digital archiving specialist Mobilitas which has been helping the Senegalese government on a project to digitise public services. Citing statistics from McKinsey Global Institute, Mobilitas says 3.3 per cent of Senegal's GDP comes from internet-related activities and as a result it does more than many Western countries, including France and Germany.

"In ten years, the digital economy will probably weigh 10 per cent of African GDP," says Alain Taïeb, chairman, Mobilitas. "Digital should be an integral part of the services provided by the public authorities."

Mobilitas has been working with ADIE, the Senegalese state agency in charge of IT policy. It has setup the Tele-Request of Authorisation to Build ('TeleDAc') platform which facilitates the conditions for obtaining building permits through the complete digitalisation of the procedure.

"Eighty per cent of the work of an administration consists in sharing information with users as well as with the other services of the state," says ADIE DG Cheikh Bakhoum. "In this respect, the implementation of TeleDAc is essential for the modernisation and effectiveness of public action."

Since being launched, TeleDAc is said to have made a significant contribution to improving access to public services in Senegal, reducing administrative costs for users by 25 per cent and reducing the risk of corruption. Mobilitas says the time required to complete and issue planning certifications has been cut from a minimum of three months to approximately 28 days.

It adds that the platform also strengthens the standardisation of public electronic archiving, with 200,000 applications for building permits digitised following the introduction of the system at town planning departments in Dakar.

CETel to acquire Onlime's managed satellite services business

CETel has agreed to acquire Onlime's managed satellite services for an undisclosed amount. Onlime says the spin-off will help it to fully concentrate on the expansion of its existing African focused software and communications businesses. According to the firm's CEO Paul Ziegler, this present a "coherent value-added service" to CETel's strength in the provision of VSAT and managed satellite service.

He adds: "Onlime continues to operate its teleport facility to serve satellite operators and service providers with enhanced teleport and data centre services. But our future focus will definitely lie in working together with CETel to serve customers in the African and Middle East markets offering both satellite and terrestrial solutions."

Orange to invest millions in African startups

Orange is creating a new Africa section in its flagship programme for investment in startups.

Orange Digital Ventures Africa is the group's investment vehicle for early-stage innovation projects in areas such as new connectivities, fintech, IoT, energy and e-health. The company says its aim is to target startups solutions responses to the continent's fundamental challenges while leveraging its own assets on the continent.

It is committing EUR50m to support new entrepreneurs on the continent. This corresponds to half of the direct investments that will be made via the

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Deputy CEO Pierre Louette says Orange is supporting Africa's digital ecosystem.

Orange Digital Ventures programme; the other half is devoted to indirect investments through specialised funding for Africa. All innovative startups will be legible for support, whether they're based on the continent or address its issues from elsewhere.

Orange plans to setup a dedicated Digital Ventures team based in Dakar in September in order to respond to the startups' need for responsiveness and simplicity.

Pierre Louette, deputy CEO and chairman of Orange Digital Ventures, claims new services and business models in Africa have been one of the priority investment themes of the group's corporate venture business.

He adds: "With this announcement, we are engaging a bit further alongside the African digital ecosystem which, like everywhere else and maybe even more than elsewhere, carries with it a development challenge."

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
10/5/17	Safaricom	Kenya	FY17	KES	212.89 (bn)	103.61 (bn)	1.21	Service revenue grew 14.8% YoY to KES204.1bn driven mainly by growth in active users & increased usage of non-voice services, mainly *M-PESA* & mobile data. Non-voice service revenue accounted for 54.2% of service revenue, recording a growth of 27.3% to KES110.7bn. Overall voice service revenue now stands at 45.8% of service revenue.
6/6/17	IDT Corp.	US	3Q17	USD	370.0	9.1	0.28	Earnings up 4.2% compared to 3Q16, driven by wholesale carrier services & payment services. But revenue from retail communications fell 8.9% YoY to $148.6m. *BOSS Revolution* calling service negatively impacted by increased competition from wireless operators' 'unlimited' offerings & rise of OTT voice & messaging.
6/7/17	Lancom Systems	Germany	FY16	EUR	>50	NA	NA	Grew by 22% &, for the first time, generated revenues of more than EUR50m. Growth was across all product lines – routers & VPN gateways, switches & WLAN.
18/7/17	C-COM Satellite Systems	Canada	2Q17	CAD	3.03	NA	0.0125	Earnings for the VSAT antenna specialist increased 68% QoQ.
18/7/17	Ericsson	Sweden	2Q17	SEK	49.9 (bn)	−788	-0.30	Reported sales down 8% YoY; plans to accelerate actions to cut costs & ensure it can meet target of doubling 2016 operating margin beyond 2018. MEA accounts for 13% of sales, & YoY earnings for the region were down 17%. Sees some limited signs of recovery in MEA's macro-economic environment, but challenges in capacity business continued, accompanied by decline in services domains.
20/7/17	Millicom	Luxembourg	2Q17	USD	1,517	535	0.22	Total revenue of declined 1.5% YoY. In Africa, the telco says its primary objective this year is to ensure that the region can fund itself going forward. Results exclude Tigo Senegal which was sold to Wari group for USD129m earlier this year.
28/7/17	Eutelsat	France	FY16-17	EUR	1,477.9	1,133.6	1.21	Like-for-like earnings down 2.2% but in line with expectations. CEO Rodolphe Belmer said performance supported by "solid" commercial momentum in core video business & other verticals, particularly mobile connectivity.
28/7/17	SES	Luxembourg	1H17	EUR	1,048.7	687.1	0.56	Expected improvement in YoY development between 1Q17 (-4.2%) & 2Q17 (-1.9%) led to overall reduction of 3.1% for 1H17 compared with prior period.

Airbus promises "new era" in PMR communications with TETRA server

Airbus reckons its new IP-based *Taira Tetra Server* for PMR networks can replace conventional switches

MANUFACTURER: Airbus

PRODUCT: Taira Tetra Server

MORE INFORMATION: www.securelandcommunications.com

and operates at much lower costs. According to the company, the server is smaller than a typical switch and works more efficiently and economically while still providing high service availability.

It has also been designed to be easily managed as it fits into existing IT environments. Airbus says using modern IT server technology in the framework of a TETRA network enables operators to integrate a TETRA system into their existing

data centres. The network can then be operated with the same processes and personnel used for other IT services.

The *Taira* consists of standard solutions with virtualisation layers. Airbus says this ensures true hot standby redundancy even in extreme situations.

It adds that thanks to the virtualisation of COTS hardware, server capacities can be exploited in a better way. For instance, Airbus says the server enables the installation of TETRA in complicated and narrow surround-

ings, such as in mining, airports or in underground systems, for example.

The company goes on to claim that all this helps operators to reduce their opex, and marks the start of "a new era" in critical communications infrastructure.

© AIRBUS

Monitoring tool can reveal 'silent unhappy customers'

Cloud-based customer experience

MANUFACTURER: SpatialBuzz

PRODUCT: RF measurement tool

MORE INFORMATION: www.spatialbuzz.com

analytics and service monitoring specialist SpatialBuzz has launched a new handset measurements tool to help MNOs to identify customers receiving poor service levels.

It works by collecting radio related measurement data in real-time. Using a unique set of algorithms, SpatialBuzz claims its solution allows cellcos to geospatially visualise RF conditions on the network. It says

the tool is quick and easy to deploy, and can be embedded into existing operator self-service apps.

The tool retains anonymity for the customer, and is said to be optimised to minimise battery usage. Subscribers can choose to opt-in or out of the service at any time.

According to SpatialBuzz, device measurements not only help diagnose dissatisfaction hotspots faster, they

also help identify where dissatisfaction might be increasing. It adds that the new tool also allows for a "deeper, relevant and more meaningful" conversation to be had with customers experiencing network problems.

Furthermore, the company says hotspots of 'silent unhappy customers' can be revealed by using the tool for subsequent experience optimisation and engagement.

G+D SIMs for secure connection of IoT devices

G+D Mobile Security reckons its *IoT Attach* and *IoT Advance* SIMs are "essential solutions" for connecting billions of IoT devices.

It says the two modules have been developed in cooperation with reference mobile operators and IoT application providers. According to the company, the dedicated SIMs not only offer the benefit of network protection to MNOs, but also protect IoT data and help tackle the major concern of IoT device lifecycle management.

IoT Attach and *IoT Advance* are

MANUFACTURER: G+D Mobile Security

PRODUCT: IoT Attach & IoT Advance

MORE INFORMATION: www.gi-de.com

the first in a series of IoT-specific products from G+D. While further form factors are under development, the company says the current solutions offer operators the required services and performance with "ultimate" flexibility.

Both SIMs come equipped with end-to-end security which secures data from the IoT endpoint, through the LPWAN (low power wide area network), and onto the application server.

In addition, it's claimed *IoT Advance* provides further flexibility in terms of power optimisation, root-of-trust for firmware updates over the air, and QoS.

Infinera launches *XTM II* for metro packet-optical apps

Infinera has unveiled its next-generation packet-optical platform for delivering rich Layer 0, Layer 1 and Layer 2 services with high density, low latency and low power consumption.

A key component of the new *XTM II* platform is the 400G Flexponder. This is a dual, 200G muxponder that uses 16QAM for high-capacity transport, or a dual 100G transponder that uses QPSK for longer reach operation.

Infinera says the device provides 400G of line and client capacity per slot, giving an eight-fold density increase over the previous generation.

Including optics, it adds that the device operates at as low as 20W per 100G service which it believes is the lowest power consumption per 100G available in the industry on any WDM-based platform.

The *XTM II* also includes the

EMXP440 transport switch which provides Layer 2 packet-optical switching with dual 100/200G ports and 12 or 24 10G ports.

The switch supports CE and MPLS-TP, packet transport with sub-50ms protection, MEF CE 2.0 service creation, and QoS-aware traffic aggregation.

MANUFACTURER: Infinera

PRODUCT: XTM II

MORE INFORMATION: www.infinera.com

R&S signal generator offers lowest possible phase noise

Rohde & Schwarz (R&S) has introduced a high-end analogue RF and microwave signal generator.

The *SMA100B* has a frequency range up to 20GHz and is claimed to be the most powerful analogue signal generator on the market. R&S says it provides the "purest"

MANUFACTURER:
Rohde & Schwarz

PRODUCT: SMA100B

MORE INFORMATION:
www.rohde-schwarz.com

signals with the "lowest possible" phase noise at all offset frequencies (1GHz, –152dBc/Hz, 20kHz offset). A 6GHz instrument generates up to 38dBm RF output power, and a 20GHz instrument generates up to 32dBm in the microwave frequency range.

The vendor adds that harmonics are extremely low across the entire frequency range; above 6GHz it says they are even significantly lower than 70dBc at 18dBm output power. Non-harmonics are also said to be below 110dBc at an output signal of 1GHz.

The *SMA100B* is also claimed to be the world's only analogue signal generator that can simultaneously provide a second, independently configurable, extremely pure and synchronised clock signal up to a frequency of 6GHz. As a result, R&S says users can characterise ADCs with a single signal generator.

New cellular router offers power versatility and SDN management

Lancom Systems has extended its range of LTE/4G cellular routers with a new *700* series device. The *730-4G* is aimed at supplementing network infrastructures with LTE/4G and, when used in combination with the vendor's routers, is said to be "ideal"

MANUFACTURER:
Lancom Systems

PRODUCT: 730-4G

MORE INFORMATION:
www.lancom-systems.com

for intelligent backup scenarios.

The *730-4G* has an integrated LTE/4G modem with 2G/3G support, and provides a wireless broadband connection at speeds of up to 100Mbps.

Power can be supplied via a GbE connection with PoE support (as per IEEE 802.3at). As a result, Lancom says the device can be positioned to take direct advantage of the best available cellular signal without expensive cabling for the power supply or for external LTE/4G antennas. Alternatively, the device also operates with the standard power supply unit it is shipped with.

The *730-4G* can be managed either with Lancom's conventional management tools or from the *Lancom Management Cloud (LMC)*. It's claimed the *LMC* is the world's first management system to employ SDN technologies for the intelligent orchestration, optimisation and control of an entire network (SD-WAN, SD-LAN and SD-WLAN). The firm says this "greatly" simplifies the management of installations of any scale, from small to very large.

Wi-Fi Alliance adds indoor positioning

The Wi-Fi Alliance says its new certified *Wi-Fi Location* feature has "advanced" capabilities to meet growing market demand for mobile location-based services (LBS) indoors. It believes this will enable the creation of new, feature-rich applications

MANUFACTURER:
Wi-Fi Alliance

PRODUCT: Wi-Fi Location

MORE INFORMATION:
www.wi-fi.org

and services that will benefit many markets including enterprise, retail, manufacturing and healthcare.

Based on the Fine Timing Measurement (FTM) protocol from IEEE 802.11-2016, it's claimed *Wi-Fi Location* delivers metre-level accuracy for indoor device location data. By leveraging the ubiquity of Wi-Fi networks, it is said to deliver accurate and reliable position data without the need to deploy a separate or proprietary network infrastructure.

Wi-Fi Location works by determining the distance between two Wi-Fi devices, such as an AP and smartphone. It then

measures the time that it takes for the wireless signal to travel from one device to the other.

Until now, devices typically determined indoor location by measuring signal strength, which has limited accuracy, or fingerprinting, which is more difficult to maintain, according to the Wi-Fi Alliance.

The first *Wi-Fi Location* products which comprise the testbed for interoperability certification include Broadcom's 802.11ac *Acculocate* AP, Mediatek's *MT663X* 802.11abgn/ac Ref. STA, Realtek's *RTL8812B*, amongst others.

ALSO LOOK OUT FOR

Researchers develop wearable power sources

Researchers at the UK's University of Surrey are developing technology that will allow people to act as their own power source through 'smart' clothing.

The wearable power sources are triboelectric nanogenerators (TENGs). These energy harvesting devices convert the movements of materials that produce static charge into usable electricity. This can then be stored in batteries or supercapacitors, and used to charge mobile phones or power medical devices. It's claimed large scale TENG networks could also provide household power requirements in off-grid areas.

The researchers have introduced a new model of the TENG concep which was originally invented by Prof. Zhong Lin Wang at Georgia Tech. The researchers say they have improved the sensors and energy generating devices that can be made into wearable applications, such as sewn into a tee-shirt like a patch (*pictured below*), or attached inside a pair of shoes.

Principle project supervisor and Advanced Technology Institute director Prof. Ravi Silva says: "Wearable TENGs can be made from natural fabrics, such as cotton or wool, so the idea is carbon-friendly 'renewable' technology that could be used for years."

TENGs could also be used in a sensor pad on a pavement which, when stepped on by pedestrians, would create the energy needed to light streetlamps. They could also be placed inside a tyre and connect to the vehicle's battery to generate electricity.
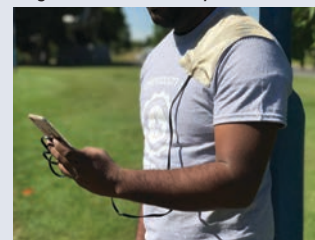
Located 60km away from Nairobi, Konza is expected to be the largest technology city in sub-Saharan Africa when it's completed by 2030.

Getting on top of smart cities

There has been a lot of talk about smart cities in recent years, but what's actually happening in Africa? RAHIEL NASIR finds out.

Kigali is aiming to become a smart city model for other African nations to follow. And as reported in our last issue, it moved a step closer to that ambition with the launch of a government-backed IoT project featuring technology from Actility, Inmarsat and Nokia.

What's happening in the Rwandan capital is significant because although there is currently a great deal of talk about smart cities around the world, the reality in Africa is that nothing seems to have progressed beyond the disparate private sector IoT deployments, independent technology trials, and various PoCs being currently conducted. For instance in late 2013,

IBM opened its first research lab in Africa. With facilities in Nairobi and now also Johannesburg, the company said the lab gives researchers the ability to analyse and draw insight from vast amounts of data in the search for solutions to the continent's "most pressing challenges. So what has it achieved over the last four years?

IBM research scientists Tapiwa M. Chiwewe and Bonolo Mathibela say that the Kenyan and South African centres are focused on brownfield developments and smart hubs that are theme-based projects. These include using smart solutions to cover infrastructure gaps and single solution city-wide systems, such as IBM's

traffic optimisation and air quality management projects, for example.

"We have also been looking at adding intelligence to city microcosms which have all the characteristic city flows, such as waste, water, energy, people and goods, but at a smaller scale such as in airports, hospitals and campuses. For example, we are using machine learning and IoT technologies to ingest and learn from vast amounts of Big Data, including weather and pollutants, to create some of the world's most-accurate energy and environmental forecasting systems."

More specifically, Chiwewe and Mathibela explain that the researchers are using data from three

air quality monitoring networks in Johannesburg, Thswane, and the Vaal Triangle in South Africa. These provide forecasts for the following day, and the plan is to provide daily forecasts for up to seven days in advance to enable city officials to track down polluters and police them.

Citing reports from Frost & Sullivan, the scientists say Africa is expected to get five smart cities by 2030, including the USD14.5bn Konza Technology City development in Kenya which IBM is involved with.

Located 60km away from Nairobi, Konza is a flagship project that is part of the Kenya Vision 2030 initiative, and was initially conceived to capture the country's growing global business process outsourcing and IT services sectors. Development on the 5,000 acre site is currently ongoing, and when it is completed by 2030, Konza is expected to be the largest technology city in sub-Saharan Africa.

It will have an integrated urban ICT network that supports delivery of connected urban services and allows for efficient management of those services on a large scale. Data will be gathered from smart devices and sensors embedded in roadways, buildings and other assets. The collected data will then be shared via a smart communications system and analysed by software that delivers valuable information and digitally enhanced services to citizens. For example, roadway sensors will be able to monitor pedestrian and automobile traffic, and adjust traffic light timing accordingly to optimise traffic flows. Furthermore, Konza's population will have direct access to the data, enabling them to participate directly in city operations and practice more sustainable living patterns.

Africa's unique challenges

While it is arguably comparatively easier to factor in smart city functionality with greenfield city developments, how can existing cities be made 'smart' using technological interventions?

In the words of Chris Mason, EMEA sales director and VP of business development at mesh wireless network specialist Rajant, the IoT cannot be brought to life without a robust infrastructure surrounding it. "IoT connects separate 'things' that we never imagined combined – such as a traffic light and artificial intelligence – which are able to come together to create something innovative. IoT has the potential to transform businesses, changing the way they operate to keep up with growing competition."

According to Ammar Sabbagh, Ericsson's global principal consultant for smart sustainable cities, smart city transformation is a journey: "It starts with vision and then a proof a concept, then a trial, and finally a deployment. To build a smart city you need to have access to every corner of the city (parking areas, airports, malls, ports, streets, buildings) to deploy sensors and connect them to the IoT network. So connectivity plays a major role in any city planning to deploy smart solutions."

This is where network operators play their part. As IBM points out, more people in developing countries have access to telecoms networks than to basic services such as electrici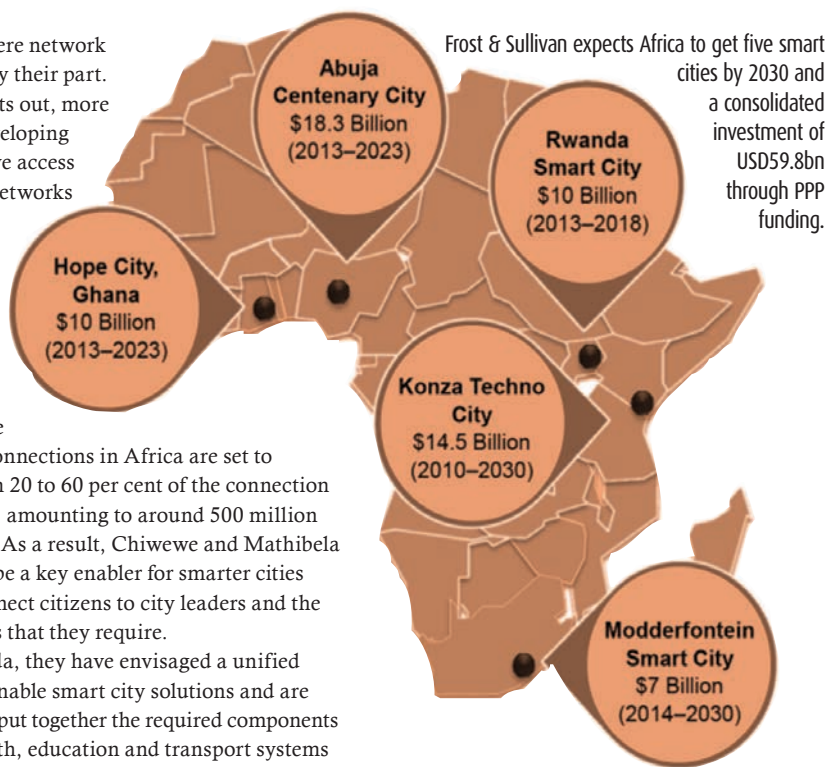ty, running water and sewerage facilities. It says mobile broadband connections in Africa are set to increase from 20 to 60 per cent of the connection base by 2020, amounting to around 500 million connections. As a result, Chiwewe and Mathibela say this will be a key enabler for smarter cities as it will connect citizens to city leaders and the basic services that they require.

"In Rwanda, they have envisaged a unified platform to enable smart city solutions and are beginning to put together the required components for their health, education and transport systems to connect to it, share data and create end-to-end solutions. More than 4,500km of fibre optic cable has been rolled out across the country so far, with investment estimated at USD120m."

As a network operator, Vodacom's view is that the smart city ecosystem is modular. Deon Liebenberg, the company's managing executive for the IoT, says: "There are many examples of modular deployments in cities across Africa – from smart metering through to video analytics for security. The next phase of these modular executions is to combine the data in its entirety and to look at how it can be used in creative and different ways to establish smart communities and, eventually, fully integrated smart cities. Our focus should be placed on driving solutions to the socio and economic challenges that are unique to Africa."

Liebenberg adds that Vodacom recently launched a citizen engagement app to allow communities to report service delivery issues directly to their local municipalities. "User-based content such as this, being fed into platforms and complemented by sensors and Big Data analytics, will also contribute towards the development of smart communities and, in time, smart cities."

Nick Ehrke, Southern Africa sales director with wireless equipment specialist RADWIN, agrees that smart city solutions should focus on meeting the continent's unique challenges. He says: "In May, Rwanda hosted the third *Transform Africa Summit* that focused on developing smart cities. Smart cities aim to leverage technology solutions to improve the efficiency of cities in Africa. Specifically mentioned was the need to develop and roll out services like public Wi-Fi, as well as implement cashless payment systems. From this summit, it is apparent that the concept of a 'smart city' in Africa is simply the desire to develop our emerging continent to developed world standards."

Frost & Sullivan expects Africa to get five smart cities by 2030 and a consolidated investment of USD59.8bn through PPP funding.

Abuja
Centenary City
$18.3 Billion
(2013–2023)

Rwanda
Smart City
$10 Billion
(2013–2018)

Hope City,
Ghana
$10 Billion
(2013–2023)

Konza Techno
City
$14.5 Billion
(2010–2030)

Modderfontein
Smart City
$7 Billion
(2014–2030)

UK-based Telensa specialises in wireless smart city control systems and was formerly part of electronic design consultancy Plextek. Its director of strategy Jon Lewis admits that progress in Africa has been slow, and like his peers above he says many of the continent's cities suffer from precisely the kind of problems that can be solved by smart city technologies.

For instance, like IBM, he notes that air quality is a common problem throughout Africa and believes it is directly related to traffic flows. He says Telensa is currently trialling a system that combines video-based traffic analytics with air quality sensors in order to provide real-time, hyper-local data to help cities identify and reduce pollution.

The company is also assisting cities that suffer from power outages at peak times. "This is a problem that we help mitigate in several ways," says Lewis. "It includes providing improved control over street lighting, enabling dynamic dimming during periods of peak demand, and also a demand/response system that can be used to switch off electric water heaters under the control of the electricity utility.

"These are just two examples of how smart city technology can bring benefits by reducing electricity requirements at peak times, which in turn can help reduce the number of blackouts."

He adds that Telensa has deployed its first African smart lighting network for an unnamed West African country, but does not give further details.

When it comes to the IoT technologies that are used to deliver smart city services, Cisco Jasper points out there are a number of critical components that cities need to consider. (Cisco completed its acquisition of IoT platform provider Jasper earlier last year.) Sanjay Khatri, the company's head of platform product marketing, says: "In most cases, cities are likely to use a combination of several

connectivity types (fixed/wireless, narrowband/broadband, licensed/unlicensed) given the diversity of smart applications. As a result, cities will also need common platform(s) for managing connectivity, data and hosting applications."

And as with all technologies, he says metro authorities need to consider security and privacy: "This is not just about securing the connectivity and data (although those are critical). Cities also need to determine how they will handle the sharing of city data with private third parties."

During the planning stages, Khatri says Cisco Jasper has seen a number of best practices that can lead to success. He advises that the process should begin by assessing which areas of city life can be impacted with smart technology applications. "Planners should then develop a public-private partnership to address those opportunities. Start small, but keep your eye on where you want to grow eventually. And embrace open and standards-based solutions wherever possible."

Smartening the city

While Khatri's advice is to "embrace open standards", when it comes to wireless communication technologies for enabling the IoT networks needed for creating smart cities, there seem plenty to choose from.

Industry body OneM2M was setup to develop technical specifications and architecture for machine-to-machine services and the IoT. Omar Elloumi, chair of the organisation's technical plenary, says it's all about covering the city with the right types of connectivity, from a low power wide access type of network through to pervasive fibre infrastructure for high bandwidth use cases.

"Each city will have its own priorities and vision; there is no one-size-fits-all approach, and deployment strategies will also differ. All cities will, however, share the common goal of cost efficiency, choice of technology, and secure handling of data that can be used to enrich the

IBM research scientist Bonolo Mathibela and her colleagues have developed a traffic optimisation tool that can help city officials dispatch traffic volunteers, known locally as 'pointsmen', to intersections where they're most needed due to unreliable traffic lights.

services offered to consumers."

Elloumi goes on to point out that there are certain capex and opex costs attached to deploying a specific technology, so limiting the number used should be an important goal for city planners. He says a "smarter" approach should be adopted to smart cities through what OneM2M describes as the "horizontal" approach. This enables different IoT use cases to be supported by the same platform. It differs from the "vertical" approach where cities might have several dedicated IoT platforms, such as one for smart metering, another for waste management, etc.

"Interoperability of this sort, where different apps can use the same device management and security software, or where sensor-generated data is put to multiple uses, can reap huge cost savings for city authorities, especially as apps and devices proliferate."

Narrowband RF mesh network specialist CyanConnode supports this view. In early 2015, it signed an agreement with XLink Communications for the distribution of its smart metering and lighting solutions as well as related IoT applications in South Africa. (As an aside, XLink is now 100 per cent owned by Vodacom, and in its latest trading update for 1Q17, the mobile operator reported that its IoT revenue in South Africa was up 28.9 per cent to ZAR192m (USD14.6m), and that it now had 3,100 IoT (M2M) connections in the country, a 23.3 per cent rise YoY.)

CyanConnode's SVP of global sales and marketing Geoff Sarney says having separate communication infrastructure for each application is costly so collaboration amongst stakeholders is key. He adds that also having a solution that can scale as the market and technology evolves will ensure that current and future services can be connected. "This phased approached allows stakeholders to leverage investment in one application, for example smart metering, to build-out smart city services."

Sarney continues by saying that one of the key challenges facing smart metering and IoT is the future sustainability of bandwidth at the frequencies needed to support solutions already deployed in certain countries.

"In parts of the spectrum currently used, there is a finite amount of bandwidth across which to send data. And with more devices being connected every year, the spectrum is filling up.

"One way to continue adding devices without further congesting the spectrum is to send information via lower bandwidth radio frequencies, or 'narrowband'. Narrowband RF technology is usually considered to cover frequencies 300 to 3400Hz and is sufficiently narrow that its frequency response can be considered flat."

Sarney explains that applications using narrowband consume considerably less power (a key requirement for IoT applications) and are not as spectrum-intensive as those using higher frequencies such as 800MHz and above. As a result, he says narrowband RF networks enable significant growth in the number of connected

devices and conserve valuable bandwidth.

Lewis adds to this by claiming that the investment required to roll out Telensa's ultra narrow band (UNB) network is "tiny". And once they have rolled out the network, he says authorities can try different applications in order to assess what mix of technologies works for them. "Purely in the context of smart street lighting, we would expect the network to pay for itself within four to six years from energy and maintenance savings alone. However, the payback time can be reduced to as little as two years if the city deploys other services over the network. Therefore, there should be no real financial barriers, and it is only the imagination and will of politicians that needs to be unlocked."

On the subject of spectrum, Lewis says UNB networks operate in license-exempt frequencies and use base stations that can be placed on street lights or low-cost poles. "Unlike mesh network technologies, which require complex installation and management, a UNB network can be installed in a matter of hours," he claims.

Naturally, the mesh specialists disagree here: "As experts in managing data communication our *Omnimesh* platform enables customers to build-as-you-go, cost effective networks," says Sarney. "[This is] ideal for smart cities, as gateways and devices can be deployed for the first application, such as smart metering, which creates coverage for future applications. This approach supports cash flow, uptime and verification of end to end efficiency."

Rajant's Mason adds his voice to the debate by saying: "Without a mobile, scalable, reliable wireless network that allows real-time data transfer, many parts of a city may be running on outdated data, or not be able to access data at all. *Rajant Kinetic Mesh* technology seamlessly integrates with existing communications infrastructure to support these highly varied users and needs."

The right technology platform

There are several IoT technologies for connecting devices over long distances without internet connections. For instance, IBM says it was a founding member of the LoRA Alliance that promotes the use of *LoRaWAN*, a low power wide area network (LPWAN) specification intended for wireless battery operated 'things' in a regional, national or global network. Kigali's IoT deployment mentioned at the start of this article is based on a *LoRaWAN* platform.

Despite advice from the likes of oneM2M about minimising technology platforms in order to keep costs down and simplify deployments, the reality is that there will be a possibility for several networks to be implemented in a smart city since every corner of the metropolis needs to be covered, according to Ericsson's Sabbagh: "So we will see 4G/5G networks deployed for critical smart city applications, and LoRA and Sigfox or other low bandwidth connectivity options for non-critical applications."

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

MobileMark
antenna solutions

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."

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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.

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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.

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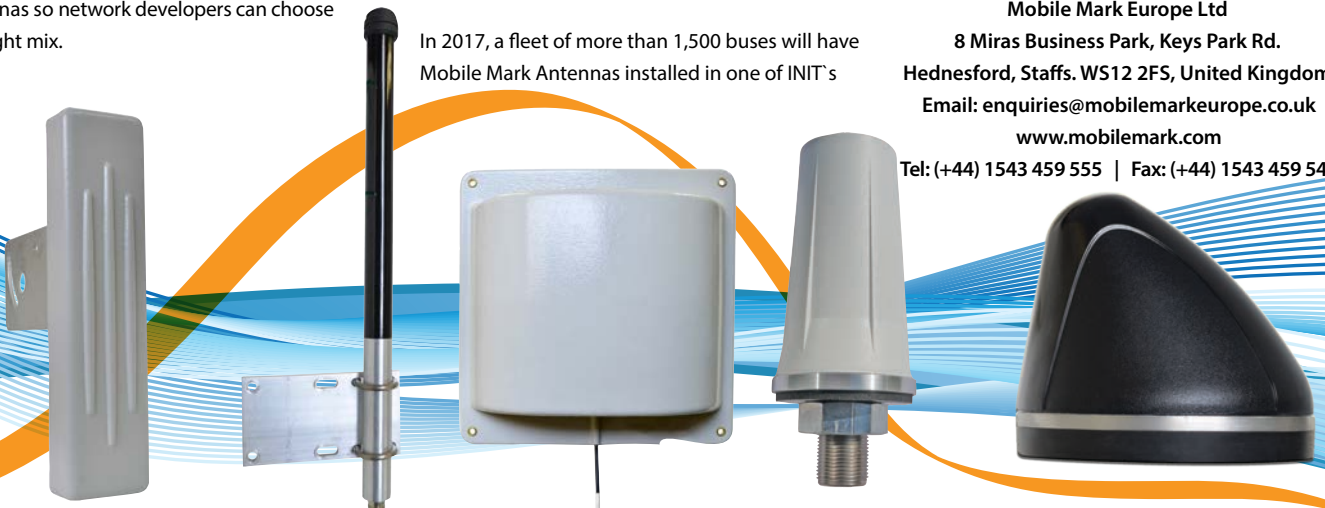
IBM's Chiwewe and Mathibela say that more specifically in South Africa, companies are rolling out extensive IoT networks that make use of sub-gigahertz wireless communication such as LoRa, DASH7, amongst others. "SqwidNet, for example, already has 38 per cent population coverage and this is expected to grow to 85 per cent in the next year."

SqwidNet is a subsidiary of South African open-access fibre connectivity provider DFA. It is the country's licensed operator of Sigfox, the France-based connectivity provider that has built a global IoT network.

RADWIN's Ehrke believes "without a doubt" that to create smart cities requires multiple technologies, including both wireless and wired systems. "Wireless systems will be used for a variety of applications, from metering systems, sensors, actuators and networking systems etc., through to mobile security, building connectivity and voice services. For any smart city to work, be beneficial and fulfil its promise, all these systems would need to work together."

Another M2M/IoT technology standard that has been around for a while now is Weightless. Developed by a special interest group (SIG) whose board members are Accenture, ARM, Sony Europe and Ubiik, the latest version of the standard was due to be officially launched in early August 2017.

It's claimed *Weightless-P* is an open standard for a high capacity LPWAN designed for performance. According to the SIG, when IoT connectivity technologies are being considered, users factor-in parameters like cost, battery life and range. While this is not wrong, the group says it is easy to overlook the importance of network capacity. "Capacity is not just about the number of simultaneously connected nodes," it states. "It is about mean data packet length, transmission time, frequency of transmissions and interference mitigation."

Alan Woolhouse, chair of the Weightless SIG's marketing working group, says a Weightless-based network is currently being deployed in Réunion. While he is unable to divulge further details, he says the operator there was aware of all the LPWAN options, such as LoRa and Sigfox, but opted for Weightless as it "ticked all the boxes".

"He didn't say exactly what these were but I can give you an outline of what the differences are," says Woolhouse. "*Weightless-P* is narrowband modulation scheme technology and *LoRaWAN* is a spread spectrum technology. What that means is that a LoRa data packet occupies the entire bandwidth available in ISM spectrum, whereas a narrowband scheme communicates in narrow channels. So you have a much higher spectral efficiency with a narrowband technology solution than you do with a spread spectrum solution, and that translates into higher network capacity. Very roughly – depending on different regulations and implementations – *Weightless-P* has 100x the capacity of *LoRaWAN* (that's based on a typical data packet size and a typical interval between transmissions)."

According to Woolhouse, *Weightless-P* "listens before it talks" and that enables it to schedule uplink traffic from end device to gateway. "If you

can do that, you can guarantee that that piece of data will join the traffic stream in a way that avoids data collision."

He continues by saying that a few years ago Sigfox seemed destined to be the winner for LPWAN technology, and now *LoRaWAN* is in the ascendancy. "But today, people are generally fairly confident that NB-IoT is going to be a core technology that will prevail over the longer term. Weightless agrees with this, but we also feel that there is space for complementary, private network technology in unlicensed spectrum. The MNO's business model says there is much higher ARPU from people using their mobile phones to access *YouTube* videos than from a machine that might, once in a while, send a few bytes. So it makes sense to offload some of that traffic to a different network in the same way that 4G and Wi-Fi are complementary today. Weightless and NB-IoT will therefore be complementary."

Woolhouse adds that the two standards have exactly the same benefits. He also points out that Ubiik, the primary vendor of *Weightless-P* technology, and the 3GPP community have each chosen 12.5kHz as the channel width for their transmissions as this offers optimum performance Furthermore, he emphasises that Weightless is a genuinely open standard: "The technology is available for developers to use on a FRAND and zero royalty free basis. That cannot be said for technologies like LoRa which use SEMTECH chipsets and chirp spread spectrum modulation schemes that are proprietary."

Interoperability or bust?

Is the idea of a smart city doomed to failure if there are no agreed industry standards? "We see lot of broad-based initiatives stall due to lack of common technology and policy frameworks," says Cisco Jasper's Khatri. "So even as a city considers its first connected services, it should have a roadmap of future connected applications and outcomes it may want to pursue, and select technologies and platforms that will enable broader systems."

He adds that although most cities start with a single connected project, they must understand from the beginning that this isn't about enabling a single application: "Rather, it's about starting with a particular application to enable a specific outcome – while enabling future connected services. Ultimately, a fully-realised smart city consists of a range of applications that are interconnected and inter-dependent."

Khatri points out that where standardisation has to happen is at the data model and application enablement layer. Vodacom's Liebenberg agrees here when he says that it's all about the data that's used, as opposed to the devices being interoperable. "The devices don't necessarily interconnect – rather, it's the data that is extracted from those devices that creates the value positioning of a smart city. It's the way that the data joins dots that's important, not the devices interconnecting.

Dr. Omar Elloumi,
Technical
plenary chair,
oneM2M

"Each city will have its own priorities and vision; there is no one-size-fits-all approach, and deployment strategies will also differ."

"Vodacom's Our view is that the smart city's success is based on how you use the data and the outcomes of the data as well as the outcomes of the use cases which are implemented. For example, you could be collecting sensor data from traffic lights, you could be embellishing that with anonymised slow vehicle traffic and combining it with weather data to create a smart traffic flow."

For Ericsson's Sabbagh, there is no real requirement to have interoperability on the connectivity layer. He reckons the only need is to ensure everything is connected using 4G/5G, LoRa, fibre, Wi-Fi and other networks to create blanket coverage for the city. "There will be a data management layer that all data coming from different connected assets via different networks will use plus analysis all without the need to have any interoperability in the connectivity layer."

OneM2M concurs and says a smart city network will succeed if there is a platform that enables interoperability at a higher layer. "Most city planners contemplating a move from a 'stove pipe' to horizontal architecture will not want to disrupt legacy IoT implementations," says Elloumi. "Instead, they will want an integration path to bring existing rollouts on to the new platform."

He says oneM2M enables this through the use of adaptors, which can potentially interwork with any IoT wireless protocol in the field area network. These include LoRa, Sigfox, ZigBee, amongst others, as well as cellular-based LPWA systems such as NB-IoT, EC-GSM and LTE-M.

While Telesna's Lewis says standards will help to bring the IoT to consumers and will be useful in the smart city as more applications become available, he rejects the view that projects will fail without any industry agreed IoT standards.

"This should not be a reason to delay taking advantage of solutions today. Imagine if you were to put off buying a television 40 years ago because you wanted to wait for technology that you couldn't possibly have envisaged to be available. You would have been waiting for colour, then HD then 3D, then 4k. "The key thing to ask is whether technology will make a difference to my city today. And if it can and does, then you need to look for a reliable partner to deliver it." ∎

Keeping customers happy

With the right BSS and OSS platforms in place, MNOs can reduce subscriber churn and rapidly launch enhanced network services.

Orange Egypt was formerly known as Mobinil and is the Orange Group's largest operation in terms of customer numbers. With 33.9 million subscribers, it is bigger than the company's mobile operation in its home country of France where it has 30 million users (both figures reported as at end 2016).

Like many other MNOs across the world, Orange Egypt analyses CDRs in order to understand its subscribers' modes of consumption, ensure invoicing for its services is reliable, detect fraud, and for the creation of various reports for its marketing and accounts departments.

With millions of customers making around 200 million phone calls per day, the company has to manage huge volumes of data in quasi real-time. In order to improve its services, invoicing and marketing practices, it needed to extract different types of information from the CDRs, and then integrate these data into three different marketing campaigns, pricing simulation and revenue assurance management systems. Orange Egypt therefore needed a solution capable of organising these data movements and transformations.

At the same time, it had to provide adequate levels of openness to facilitate integration, not only initially with the three management systems, but also in the future with other applications, for example fraud management or legal action.

After a pre-study phase, the operator launched a call for tenders to which two major market players responded. They included GlobServ which specialises in telecoms services in France and Egypt, and offers consultancy, system integration and application solutions. Orange Egypt selected the firm to implement a solution from Talend that is specifically dedicated to managing Big Data and offers fast processing times.

Mohamed Hajji, GlobServ's business development director, says: "We completed a demonstration showing that Talend and GlobServ could meet all of the requirements. Talend also provided performance studies (benchmarks) and recommended hardware configurations. Ultimately, Orange Egypt felt that our joint offer best met its needs: GlobServ capitalised on its broad knowledge of the industry and telecom operator issues, and Talend contributed its well-known expertise in terms of integration."

According to Hajji, *Talend Big Data* uses open source, open standards technology, is easy to deploy and use, and also offers reduced implementation and integration costs. He explains that the solution

distributes data traffic loads on multiple servers (load balancing in 'active/active' mode) according to availability. This allows Orange to optimise the use of their capacities, in addition to the number of processors available to considerably improve processing times. Furthermore, the solution is said to offer horizontal 'scale out' possibilities, enabling the cellco to easily add additional servers with no restriction on the quantity allowed.

During the initial phase, the implementation involved just the management of marketing campaigns. GlobServ developed an 'Operational Data Store' for the extracted data which were then integrated into Orange Egypt's CRM application which is based on Siebel software.

"In practical terms, the Talend solution processes the Big Data originating from the CDR data or from the invoicing application," says Hajji. "After quick formatting, this data is inserted into Siebel to manage new marketing campaigns.

"In addition to marketing activities, we are also developing integration flows for two other components of this project – revenue assurance and pricing – which will be launched over time."

The CDR data comes from several systems: Ericsson network equipment; a real-time invoicing

platform for data services from Volubill; and a business support control system.

With reference to Ericsson's equipment, Hajji says this generates data in a specific format – ASN.1 – which was not originally supported by Talend. As a result, GlobServ developed an external library by adapting a market product and then integrated it into the Talend solution to guarantee the performance of the integration jobs. "Ultimately, we plan on developing a Talend-specific library which will take the form of an ASN.1 connector," says Hajji. "The scalability of the open source solution gives us great flexibility in integrating various types of data."

Orange Egypt hopes the Big Data solution will improve its effectiveness in several key areas where the financial stakes are said to be high.

Firstly, the company is looking to revitalise its marketing campaigns by increasing their responsiveness and reacting in quasi real-time as its customers' needs evolve. Data analysis also enables the operator to study its subscribers' consumption behaviour and launch marketing campaigns, for example, to offer new products.

Secondly, it is seeking to improve precision pricing by completing simulations based on the data collected. These *what if?* scenarios will help the firm analyse the accuracy of its prices and forecast potential changes by comparing several hypotheses.

Finally, Orange Egypt aims to ensure that all of the revenue expected from its service and product sales is invoiced and accounted for. The Talend platform enables the company to compare invoicing data with the actual flows passing through its network. The matching of these data from different systems then helps it track even the slightest loss of information that could have a significant impact on billing."

Cashing in on mobile data

Green Com runs the Muni branded mobile network in Equatorial Guinea. In late 2016, it launched 3G with ambitious plans to position itself as a pioneer in offering the most sophisticated data plans and promotions based on real-time business intelligence and value-added services.

However, its legacy BSS platform lacked the capability to quickly evolve to changing subscriber demands, thereby restricting its service offerings. As a result, the company turned to US-based Alepo to transform its legacy BSS environment.

Green Com's aim was to improve network operations and achieve real-time service creation capabilities. What it explicitly needed were complete, carrier-grade solutions for advanced policy control with real-time business intelligence. This would reduce time to market for new services and enhance the subscriber's digital experience.

Alepo deployed its *Service Enabler* platform and had to coordinate with multiple vendors to perform business configuration and subscriber migration from Green Com's legacy BSS system. This would ultimately reduce the operator's dependence on various suppliers with Alepo

becoming the end-to-end solution partner.

The vendor integrated its SCP, SMSC, USSD and IVR systems with a Nokia MSC. Alepo also integrated its PCRF with Nokia's GGSN.

According to the firm, *Service Enabler* features a number of components that specifically met Green Com's requirements. For instance, it features a converged system that enables real-time charging and billing, as well as a roaming and interconnect platform with billing. It also includes subscriber data management and CRM which is integrated with Green Com's legacy HLR from Nokia.

Alepo says it successfully delivered a complete business transformation within 10 months which was "well before" the project deadline. It adds that there were zero customer disturbances and zero reported data errors. The company claims *Service Enabler* has meant that Green Com has accelerated service creation and monetisation, and that it now has "rich out-of-the-box" capabilities to launch on-the-fly innovative data plans, dynamic discounting, personalised offers, application bundling, etc. As a result, the cellco can introduce additional VAS to generate revenues beyond voice and data.

As well as replacing manual billing and charging with automated real-time billing and charging, Alepo says its BSS platform prevents revenue leakage and delivers a "transparent" customer experience.

Service Enabler has also allowed Green Com to offer round-the-clock managed services support for prompt resolution of user queries and change requests – this was said to be a big challenge with the previous vendor (which is not named).

Furthermore, Alepo says it has evolved the operator's existing network and IT infrastructure to streamline overall business processes and operations.

Policy control to accelerate data innovation

Moroccan operator INWI wanted a policy-based solution enabling it to rapidly deploy new services

and create new revenue streams. Its ultimate aim was to unlock data innovation, accelerate time to market, and offer more visibility to its customers.

The solution came from Ireland-based software specialist Openet and its *Policy Manager* platform. The firm claims it was the first vendor to virtualise its BSS offers, adding that it keeps costs down by using proven open source software. All Openet solutions are built on its *Fusionworks* framework which runs on a fully virtualised automated networks platform and is claimed to ensure "ease of integration".

Policy Manager features a variety of components that have provided INWI with a number of benefits. For instance, it includes a single PCRF that interoperates with a wide array of other vendors in the operator's network. Openet says it has the ability to shape network traffic according to the type of service being accessed and the time of day, and there are QoS controls for different users, such as pre-paid versus post-paid, for example. INWI is also able to enforce user terms and conditions and bandwidth limits in real-time, thereby maximising the amount of available capacity for other customers.

Other features include support for VoLTE, enablement of shared data plans, and policy and charging control monetisation use cases. Examples of the latter include 'one day' application service passes to *Whatsapp* and *Facebook* (combined).

Openet says the new services ensure new levels of offer transparency and balance management for INWI. It says this has enabled the operator to maximise customer QoS, control local and roaming traffic, and reduce bill shock.

"Being agile and having the flexibility to react to, and capitalise on, new market opportunities is a critical contributor to our ongoing success," says Bernard Buyat, CTO, INWI. "Our partnership with Openet ensures we offer a high quality and differentiated service to our customers and ensure they remain firmly in control of their service usage."

By using *Openet Policy Manager,* Moroccan operator INWI can enforce bandwidth limits in real-time, thereby maximising the amount of available capacity for other customers.

Polystar says *KALIX* gives "clear performance indicators presented through rich, visual Insight Portals".

Automating business processes

With its headquarters in the US and R&D facilities in India, Panamax specialises in mobile financial solutions, and earlier this year, it announced it had helped Sudatel to streamline its interconnect billing, roaming, reporting, fraud management and dispute management systems.

The Sudatel Group provides mobile and fixed networks as well as wholesale services to international carriers. Among its other interests, it also owns 75 per cent of Dubai-based Expresso Telecom Group which provides services in Senegal, Mauritania and Guinea Conakry.

According to Panamax, Sudatel was using a "conventional" approach for its day-to-day management of business. This included manual billing, ineffective dispute handling, manual creation of ERP sheets, differential partner invoicing, etc. The company says the operator was creating manual rate sheets which were constantly generating negative margins and causing losses. In cases of dispute, it says Sudatel was conducting manual reconciliations which did not lead to accurate results and also consumed a lot of time and manpower.

As a result, such practises were increasing the company's overall operational cost and contributing to revenue losses. Panamax provided a solution in the form of its BSS platform, *BillCall*. The firm claims this facilitates higher operational efficiency, along with accurate interconnect billing, roaming, rating, fraud management, rate and policy management, deal and dispute management, and order management.

The platform is designed to offer business process automation with network, service and customer agility. Panamax reckons it gives carrier service providers accelerated time to market for new products and services, and also optimises development and deployment costs while supporting operators during every phase of the customer lifecycle.

For Sudatel, *BillCall* has enabled automatic near real-time billing with added features such as A-number billing. Panamax says the system is easy for the telco to access due to the availability of widgets that offer direct dashboard access, and identify partner-and destination-wise negative margin. Other platform features include *Dynamic Routing Manager* for offering flat and percentage-based margin configuration for routing, and a dispute module for CDR and invoice reconciliation.

As a result of the implementation, Panamax says Sudatel has been able to speed up its operations and make more savings. It says the accuracy of the operator's reports has been greatly enhanced with a 95 per cent success rate, and they can now be generated immediately – unlike the 6-12 hours taken prior to *BillCall*'s deployment.

Furthermore, dispute management has become streamlined with either a limited or zero number of disputes. Panamax says this has helped Sudatel to generate revenue while saving costs. Furthermore, negative margin identification has minimised losses by about 35 per cent. The company adds that CDR generation is no longer a cumbersome task for the operator, thanks to direct downloads available from the *BillCall* dashboard.

Gaining rich customer insights

Ooredoo Tunisia is aiming to gain rich customer insights and improve its subscribers' experience with the help of Polystar, the Sweden-based network and customer analytics specialist.

Previously known as Tunisiana, the operator was re-branded in 2014 after Orascom sold it to Qatari telco Ooredoo in 2011. In its recently reported financial statement for the first half of 2017, Ooredoo said its subscribers in Tunisia increased six per cent to reach eight million, which means it remains the country's market leader.

In addition to its mobile network, Ooredoo Tunisia offers a range of services for enterprise customers such as fixed broadband, cloud solutions and managed services including security and IP telephony. Additionally, the company operates a national fibre network as well as *Didon*, its submarine system that connects Tunisia to Europe.

Ooredoo Tunisia is said to have embarked on an ambitious programme of operational change to introduce a more customer-centric focus. As part of this, the company needed the abilities to more rapidly generate attractive offers for its subscribers, and to perform accurate segmentation. As a result, it sought a solution that would not only provide network quality monitoring but also crucial insights that could be used to more effectively target its marketing efforts.

Polystar says the combination of its *KALIX* and *Customer Insights Solutions* has enabled Ooredoo Tunisia to meet its goals. It claims they provide a "comprehensive platform" that delivers both the network performance information and the insight into subscribers and services required.

According to the vendor, *KALIX* provides clear performance indicators that are presented through "rich, visual Insight Portals". It says these indicators reveal valuable information regarding service usage, device activity and subscriber performance. Ooredoo can then use this intelligence to drive highly targeted and segmented campaigns to promote new offers to different subscriber groups.

"We needed to replace a legacy solution that did not provide the insight and intelligence with the flexibility we required to support our customer-centric focus," says Hatem Mestiri, CTO, Ooredoo Tunisia. "The Polystar team not only met all of our technical requirements, but also gave us additional functionality to enrich our knowledge of customer experience."

With clear visibility of real-time subscriber experience available from a range of measures, Ooredoo Tunisia now has the insights it needs to implement its customer-centric transformation plans. It can leverage these insights to proactively plan and execute relevant, targeted campaigns, based on clear segmentation of its user base, across subscribers, devices and services.

Polystar adds that its solutions also support virtualisation and are fully compatible with the overall vision of the Ooredoo Group as it moves to adopt virtualised network technology and infrastructure in the future. ∎

The Sudatel Group offers mobile services in Sudan under the Sudani name. It launched 4G earlier this year.

Cloudy forecast for Africa

Microsoft and its local partners started Project Mawingu in Nanyuki, a market town in Kenya, four years ago. It was the first time TV white space frequencies were combined with solar powered base stations to deliver low-cost broadband to a rural area that lacks even basic electricity.

Microsoft aims to "empower" every person and organisation on the planet to achieve more. AMR KAMEL is responsible for the company's mission in Africa, and describes the progress made so far.

Africa is cloud computing's next "great frontier", according to Amr Kamel. He believes this is being driven by mobile growth, decreasing connectivity costs, and more international and local vendors offering a variety of new services.

In a mobile- and cloud-first world, Kamel claims Microsoft is "deeply invested" in Africa, and that it continues to educate businesses and government organisations across the continent about the benefits of cloud.

But he acknowledges the need for tech companies, communities and governments to work together to achieve Africa's digital ambitions. As a contribution to this, Microsoft has published a book, *A Cloud for Global Good*, that details 78 public policy recommendations in 15 categories to help make cloud technologies more trusted, responsible and inclusive.

"By encouraging the adoption of cloud computing, we are also committing to the SME sector – the backbone of the African economy,"

says Kamel. "SMEs are at the heart of our *4Afrika* initiative. This was launched in February 2013 to aid in accelerating the continent's economic development and also to improve global competitiveness. Through this, Microsoft has been able to deliver on its promise to develop affordable access to the internet, skilled workforces, and innovation to increase economic opportunities in communities."

Here, Kamel cites *Project Mawingu* in Kenya as a key highlight. *Mawingu* (the Kiswahili word for

'cloud') started four years ago in collaboration with the Global Broadband and Innovations Alliance, a partnership between USAID and NetHope. It was the first time TVWS frequencies were combined with solar powered base stations to provide internet access to communities in the surrounding countryside at rates as low as USD3 per month.

Today, *Microsoft 4Afrika* currently has 15 TVWS connectivity pilots running across six countries in Africa which, as well as Kenya, also include Botswana, Ghana, Namibia, South Africa and Tanzania.

Education is the key

Kamel says there are several examples of how entrepreneurs and countries are using Microsoft and wireless comms technologies to act as digital enablers and accelerators across all sectors.

"For example, CHIFCO is a Tunisian tech startup specialising in the IoT and M2M. By using Microsoft's *Azure* platform it has developed technological infrastructure that allows users to connect their daily devices to the internet, therefore enabling them to be in control of their surroundings, wherever they are, and whenever they want.

"The adoption of IoT and wireless technology is also present in Ethiopia where individuals can walk into clinics using a biometric scanner to check in. This technology can also pick up their previous visits as well as check their medical records. After examination, prescriptions can be sent wirelessly to the nearest pharmacy."

Other examples include Botswana where Microsoft and its partners are introducing specialised telemedicine services along with a cloud-based records management system for women at local clinics. In Namibia, the company is working with MyDigitalBridge to connect three provincial regions across a 9,000km^2 area, and is also bringing 28 schools online.

Working with Africa's educators is clearly another key focus for the software giant. For instance in Ghana, it has collaborated with SpectraLink Wireless to deliver affordable

In 2014, Spectra Wireless worked with Microsoft to launch what was claimed at the time to be the first commercial TVWS services in Africa. Spectra's *djungle* service enables university students to apply for zero-interest financing to buy selected internet-enabled devices.

campus-wide internet access and cloud services along with device financing to university students for the first time *(see News, Dec 2014-Jan 2015 issue)*. And in 2016, the company teamed-up with the Ministry of Education in Rwanda to develop employment skills among students and educators through its *Partners in Learning* programme.

"The programme helps teachers and schools around the world improve students' experiences and skills through technology," explains Kamel. "It has already reached 12 million educators in 134 countries worldwide. In sub-Saharan Africa, over 13 million students have benefited from the programme to date."

He continues by saying that Microsoft has introduced its *Showcase Schools* in Kenya.

"This is a global community of schools engaged in digital transformation to improve learning outcomes. *Showcase Schools* create immersive and inclusive experiences that inspire lifelong learning, stimulating development of essential life-skills so students are empowered to achieve more.

"In Africa, 42 schools were selected as *Microsoft Showcase Schools* for 2016, boasting the highest intake in any region across the globe. It is our goal that in five years' time every African country with a national technology deployment will have a core 'army' of 21st century-ready schools. These will model new competencies and accompany other schools in their journey to transformation."

Creating "digitally savvy" societies

When asked about the challenges in Africa over the next year or so, Kamel says organisations are now managing data that are more diverse and greater than ever before. "It is estimated that by the year 2020, 30 million devices will be connected to the internet. This will include 30 billion connected 'things' that are largely driven by intelligent systems collecting data.

"In terms of the IoT, modern organisations in Africa will continue to face a variety of challenges. Microsoft recognises that advancements in technology can be exciting but also challenging to assess from a business perspective. However, with the correct tools, organisations can ensure that these new technologies generate profit. The valuable information that is obtained from these tools, along with the appropriate skills, will aid companies across the board to achieve more."

One of the challenges Kamel identifies is the skills gap. Here, he advises companies to invest in programmes that complement and strengthen curricula, thereby better equipping students for the demands of the working world.

"Education campaigns are needed to encourage citizens to participate in the digital lifestyle. Cloud computing as an example, is specifically beneficial for users in developing markets.

"Applications developed must be relevant – and this is often driven by local demand. Local developers must be given guidance to create local applications that meet local need.

"Infrastructure is of the utmost importance

Amr Kamel, GM, WECA & Indian Ocean Islands, Microsoft

"It is our goal that in five years' time every African country with a national technology deployment will have a core 'army' of 21st century-ready schools. These will accompany other schools in their journey to transformation."

for bridging the digital divide as well as democratising the information revolution by ensuring widespread access to technology.

"Power shortages and limited internet access are preventing organisations from fully embracing cloud and digitally transforming. However, African innovators are serving up technologies that address this problem."

Here, Kamel mentions Schneider Electric which has partnered with the Lagos State Electricity Board to use the cloud to deliver clean, renewable and reliable power to rural schools and healthcare centres that aren't connected to the public grid. He also talks about M-KOPA Solar in Kenya which has combined the power of mobile payments with the need for electricity.

"M-KOPA is the first company in Africa to launch a SIM-enabled pay-as-you-go solar system, allowing people to access affordable solar power in their homes. They currently facilitate over 10 million mobile payments every year and hope to connect one million homes by the end of 2017."

In conclusion, Kamel believes that a society that is "digitally savvy" will not only consume technology but create it.

"With the onset of digital transformation comes the concept of the smart cities and digitally transformed governments. Government policy in many territories is leaning towards the creation of smart nations through cloud technology, data analytics and IoT.

"One of the ultimate goals of smart nations is to reduce costs for all stakeholders, increase the efficiency in delivery of services, and democratise technology. We base our theory of the smart nation on four basic citizen rights which smart cities must be able to deliver: education, healthcare, freedom and social justice and equality. This, coupled with attention to infrastructure, investment climate, innovation and execution capability, must all be underpinned with technology for a smart nation to be achieved." ∎

New algorithms for evaluating satellite data helps create 3D maps

Researchers from the Technical University of Munich (TUM) claim to have set a world record in information retrieval from satellite data.

Using three million measurement points in one square kilometre from image stacks captured by *TerraSAR-X*, the researchers created '4-D' point clouds of Berlin, Las Vegas, Paris and Washington D.C.

Germany's *TerraSAR-X* is said to be the world's highest resolution civilian radar satellite. It has been orbiting the Earth at an altitude of around 500km since 2007, sending microwave pulses to the planet and then collecting their echoes.

However, these measurements only yield a 2-D image with a resolution of one metre, as Xiaoxiang Zhu, professor for signal processing in Earth observation at TUM, explains:
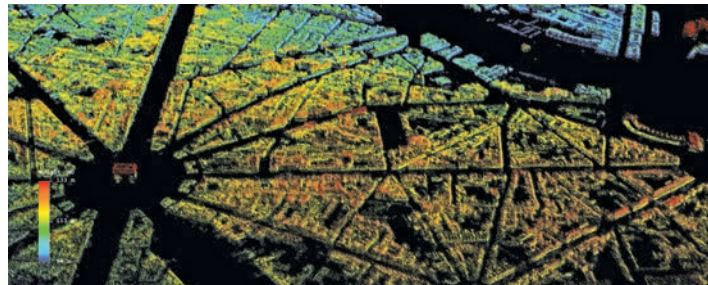
Using satellite tomography, researchers can map Paris in 3D, and show the deformation and subsidence of structures down to the millimetre. PHOTO: UNIVERSITY LIBRARY OF TUM

"The significance of the images is limited by the fact that reflections from different objects that are at an equal distance from the satellite will layover with each other. This effect reduces the three-dimensional world to a two-dimensional image."

TerraSAR-X flies over a region of interest every eleven days but its orbital position is not always the same and varies by 250 metres. As a result, the researchers use radar tomography to localise every point, and a variety of radar images taken from different perspectives are combined to create a 3-D picture. Additional compressive sensing methods are then applied to improve resolution by 15x.

Zhu has developed her own algorithm which makes it possible to reconstruct the third and even fourth (time) dimension. Since the images are taken at different times, the resulting 4-D model reveals tiny changes with a precision of around one millimetre per year, for example, the thermal expansion of buildings in the summer or deformations resulting from subsidence below the Earth's surface.

"The method is suitable for the detection of danger points. Satellite technology can thus make an important contribution to making our urban infrastructure safer," says Zhu.

Her team now plan to create four-dimensional models of every city in the world. The scientists will use various Big Data sources for the first time – measurements from satellites will be fused with data from Open Street Map and the practically unlimited stream of images, text and activity patterns provided by social networks.

Fleet to build nano satellite network to backhaul IoT

A new company is embarking on a global tour to raise funds to launch a constellation of nano satellites connecting billions of devices with the IoT.

South Australia-based Fleet Space Technologies secured USD5m in funding in April to help it launch its first two satellites in 2018. It has booked its first satellite launch with SpaceX with a second deployment planned for the middle of the year. The company aims to have a constellation of more than 100 of its nano satellites, which measure just 30 x 30 x 40cm, in orbit by 2022, potentially connecting up to 75 billion devices to the IoT.

CEO and co-founder Flavia Tata Nardini says: "With one satellite in low Earth orbit you more or less cover all of Earth – almost 90 per cent of the planet. So the first two [launches] will do a couple of tricks for us: they will show our tech and start connecting our first customers,

CEO Flavia Tata Nardini needs funding for over 100 nano satellites.

and they will secure frequencies." Nardini did not say exactly how much investment is being sought in the latest bid but it is hoped that it will fund at least half of the constellation.

Fleet believes nano satellite technology is ideal for creating a low-bandwidth global network to directly connect the millions of digital sensors already in the IoT.

It adds that vital remote areas, such as the Great Barrier Reef and Amazon Rainforest, could also significantly benefit from improved connectivity. Nardini says: "We are working in the Amazon Rainforest where people physically measure 500,000 trees a year with calipers in the middle of nowhere because there is no connectivity. People? You can do this with a sensor."

Eurasia Tunnel critical comms system features FM break-in

The Eurasia Tunnel, the first undersea road tunnel to connect two continents, has been equipped with a public safety network from Cobham Wireless.

The multi-band, multi-technology coverage solution provides the emergency services communication within the 5.4km tunnel which links two areas of Istanbul and spans both Europe and Asia.

The customised solution incorporates Cobham's digital channel selective repeaters and band selective repeaters. It supports UHF, VHF, DMR and FM technologies to ensure emergency services and operational teams can communicate at all times throughout the tunnel.

The network features two master sites. These include one combiner and one optical master unit, and sit at either end of the tunnel with one providing essential backup coverage. The sites are connected via fibre to multiple remote locations.

Each of the master sites contains a VHF repeater for communication between ambulance services, one UHF repeater each for the police and fire departments, and DMR for Istanbul's Disaster and Emergency Management Authority. In addition, a break-in system enables operational teams to access the FM channel and alert drivers to safety issues via their in-car radios.

The entire system can be overseen and controlled off-site using Cobham's *Active Element Manager*. Also, as the digital off-air repeaters are software-based, the company says new features can be easily added via a remote download.

Cobham was awarded the contract in September 2016 and worked with integration partner Yapı İDİS to

The 5.4km tunnel links two areas of Istanbul and spans both Europe and Asia.

install the system. The deployment was completed within three months in time for the Eurasia Tunnel's inauguration in December 2016.

DAS used to integrate operators

Copenhagen's new Royal Arena has overcome the problem of integrating three wireless carriers onto a single common DAS (distributed antenna system) with the help of US wireless specialist Microlab.

The 35,000m² multi-use venue opened earlier this year in February. It has a capacity of up to 16,000 seated and standing guests for cultural and musical shows, and up to 12,500 spectators for sporting events.

Eltel Networks, the Sweden-based technical services provider for critical infrastructure networks, carried out the DAS deployment at the arena. Lars Jessen, the company's business development manager, says: "Our challenge was to integrate a triple-band, high-power MIMO DAS solution for three operators. The main challenges were combining all services and operators in a compact, low-loss POI [point of interface] design with high performance and low PIM."

Microlab provided the solution with two POI designs, the *DCC601-B19* and *DCC601-B22*. These include nine inputs supporting different output configurations, and cover the Royal Arena's many sectors.

The vendor says its designs integrated the three carriers with three operating bands into common outputs. It claims that they also provided low loss solutions while achieving very low PIM and better than 55dB inter-band isolation to the passive DAS installation.

RSCC upgrades compression and multiplexing system

The Russian Satellite Communications Company (RSCC) has upgraded compression equipment at its Shabolovka Technical Centre in Moscow.

It says the refurbishments will give a boost to TV channels and media companies who want to more effectively use their orbit-frequency resources, as well as improve the quality of broadcasts without increasing costs.

The compression system is part of RSCC's technology platform, enabling it to provide what it describes as a "comprehensive, one-stop shop" service to broadcasters. The platform comprises space capacity, the radio-electronic facilities of the company's space communication centres, a programme package generation complex, and a terrestrial network. Services provided through the platform are focused primarily on media

RSCC's Shabolovka facility in Moscow is one of six technical centres operated by the company and is said to have capabilities beyond teleport services.

structures that distribute their content in Russia's cable television networks.

RSCC operates six space communications centres. As well as Shabolovka in Moscow, which offers more advanced technical capabilities, there are teleport facilities in Dubna, Medvezhyi Ozera, Skolkovo, Zheleznogorsk, Khabarovsk.

Established in 1967, RSCC owns

Russia's largest satellite constellation. Its current fleet of 12 spacecraft covers Russia, CIS, Europe, Middle East, Africa, Asia-Pacific, Australia and the Americas. It also runs its own fibre network in Russia.

The company's terrestrial spacecraft control complex monitors not only its own satellites but also those of other operators, such as Eutelsat.

Brazil FPSO fleet connects with ITC Global

ITC Global is delivering communications services to seven floating production, storage and offloading (FPSO) vessels located offshore Brazil for an unnamed oil and gas service company.

The customer provides floating production solutions to the offshore energy industry over the full product lifecycle and specialises in the construction and operation of FPSO vessels. These have been outfitted with ITC Global's VSAT solution to enable the fleet

to manage essential business communications and applications. The new infrastructure components include dedicated bandwidth links ensuring speed and uninterrupted service. All services include ITC's round-the-clock network monitoring and support.

This latest deal for ITC follows the successful deployment of its services to four vessels in West Africa last year. It represents the second of three deployment phases for the customer's globally dispersed FPSOs as part of a three-

year, multimillion-dollar contract that also covers North America.

Panasonic acquired ITC Global in 2015. It's claimed the combined company has become the world's largest buyer of commercial space segment with coverage spanning all major oil and gas hotspots, and more than 98 per cent of the busiest maritime routes globally.

The Panasonic network is comprised of traditional wide beam and HTS capacity as well as planned extreme high throughput satellite (XTS) capacity.

TETRA secures Guarulhos International Airport

Guarulhos International Airport (GRU) in São Paulo, Brazil, is using a TETRA system from DAMM to secure passenger safety and improve efficiency.

It has deployed the Danish vendor's fully redundant *TetraFlex Indoor High Power 7* carrier platform. This is said to offer a secure and reliable voice and data system which enables airports to efficiently respond to any potential danger. It includes features such as Dynamic
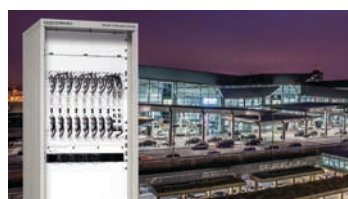
GRU is said to be Brazil's number one airport in terms of cargo passenger traffic.

Group Number Assignment (DGNA). According to DAMM, this makes it easy to create dynamic

work groups used for apron services such as luggage handling, jet-fuelling and catering.

The new IP-based, decentralised network was designed, installed and commissioned by local DAMM partner ALCON Engenharia. Its CEO Gilberto Koza says *TetraFlex*'s open API offers easy integration of third-party applications like the Siemens dispatcher solution, and was key to the airport.

GRU is said to be Brazil's number

one airport in terms of cargo passenger traffic, and reportedly saw more than 38 million customers in 2015. It has undergone an intense transformation since it began operations in 1985, and in May 2014 the airport inaugurated TPS3, a new passenger terminal geared toward international flights.

The new terminal, which covers 192,000m² and has an apron with 34 aircraft stands, has an initial capacity for 12 million passengers per year.

Avalanche detection devices using IoT connectivity

Wyssen is using IoT connectivity in its monitoring systems that help detect and prevent avalanches in the Swiss Alps.

The company uses various systems such as radars, infrasound sensors, geophones, etc., and artificial triggering techniques with explosive charges. It designs and manufactures avalanche towers which are solar powered and fitted with a deployment box holding the battery, electronics and the charges.

What's said to be a "sophisticated" algorithm is used in combination with sensors to provide an early warning of increasing avalanche activity in a given area based on detection of infrasound emissions.

All the data monitored by the towers (including feedback from weather stations), along with the results from radar installations and sensors, and footage from cameras, is sent to a central control centre where they can be analysed. Should action be required, an explosive charge can be detonated once it is confirmed no humans are in the danger area.

Due to the remote nature of the towers and the need for resilient, mission critical connectivity, Wyssen integrated multi-network SIM cards from PodsystemM2M into its devices.

According to PodsystemM2M, its solution includes global connectivity across multiple networks on one SIM, connection to the best signal on device start-up, and the ability to automatically swap to a backup network if signal is lost. It claims this gives the "most reliable and flexible" coverage for Wyssen's devices wherever they may be situated.

"The flexibility of the PodsystemM2M SIM card was paramount", says Wyssen engineer Bejamin Meier. "We wanted a single SIM card, interchangeable for each device that makes up our system. This makes management of the SIMs simple and straightforward."

Connect overcomes WiMAX and Wi-Fi-based outages

Connect has upgraded its network using InfiNet Wireless' equipment.

The Lebanese ISP uses a WiMAX network at 2.3GHz to serve residential customers, but the platform is limited to 5Mbps for downlink and 2Mbps for uplink. This meant it could not meet the high bandwidth requirements demanded by its premium residential and corporate customers.

To serve these users, Connect had to use Wi-Fi-based PTP solutions. But the frequency bands it was operating in started to suffer from major interference issues, resulting in a further drop in capacity and decreasing reliability.

"Links would go down frequently and we had to deploy field engineers to troubleshoot outages and maintain the network daily," says Jubran El Ayan, the company's RF manager. "Not only was this a drain on our resources and added significant costs to our operations, but we had several unhappy customers which was starting to hurt our reputation and revenue streams."

Connect deployed InfiNet's *InfiLINK XG* as part of its backbone network. The radio is said to be capable of reaching a peak net throughput of 500Mbps in 40MHz of spectrum and more than 130Mbps in 10MHz. It then installed the *InfiMAN 2x2* range of PTMP solutions to connect customers with higher bandwidth needs. More than 30 base stations and 250 subscriber terminals were implemented across Lebanon in just a few months.

El Ayan says that while the previous Wi-Fi-based PTP links were cumber-

InfiNet's technology has given Connect a more reliable and higher performing network across Lebanon.

some to manage and also expensive to procure and deploy, this is no longer the case with the *InfiMAN 2x2* platform. "All we need to do now is set up a base station sector in a specific area and we can provide, almost instantly, a large number of customers with high bandwidth connectivity, all achieved without disrupting any other customer or our wider network."

Platform solves three challenges for WISP

Wireless ISP Boundless Networks has replaced more than 300 of its 550 APs and is applying an over-the-air performance-improving software upgrade for thousands of its subscribers.

Boundless is said to be one of the UK's largest WISPs with a footprint running coast-to-coast across northern England. It is using Cambium Networks' *ePMP Elevate* platform to double the available capacity at each of its base stations, enabling new subscribers to be added and services to be expanded with a 50Mbps product.

The new platform is installed on subscriber modules from other manufacturers already in Boundless' network. These modules are then connected to a Cambium base station, adding critical features to Wi-Fi equipment such as frequency re-use enabled by GPS synchronisation, airtime fairness and smart beamforming.

As no hardware upgrade is required at the subscriber's location, Cambium says substantial investment in new hardware and installation crews is avoided.

Boundless CEO David Burns says the new system has solved three problems: speed, spectrum and service. "As our customers' expectations for bandwidth and service level rose, and our success in high-demand areas decreased spectrum availability, we were faced with a significant business challenge to deliver better service and higher performance in crowded airspace, without making the huge investment of replacing every access point and customer radio."

AER2100 helps break underwater record

Cradlepoint has helped a Dubai radio presenter break the world record for broadcasting live underwater.

The cloud-based network solutions specialist supplied one of its routers to Channel 4 104.8 FM radio presenter Stu Tolan, enabling him to set a new record of five hours, 25 minutes and 25 seconds.

The owner of the radio station, Al Murad Group/Channel4 Radio Networks, uses Cradlepoint devices for pop-up networking in remote areas while on the air.

Channel 4 presenter Stu Tolan was broadcasting from the 11m litre aquarium tank at Dubai's Atlantis Palm Resort.
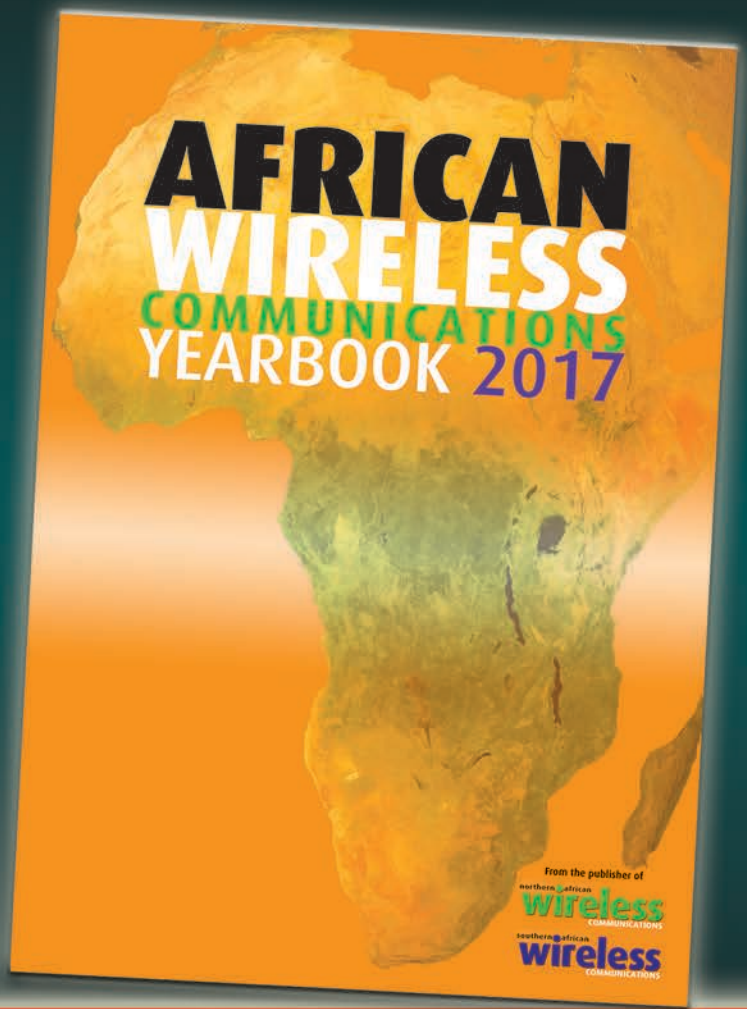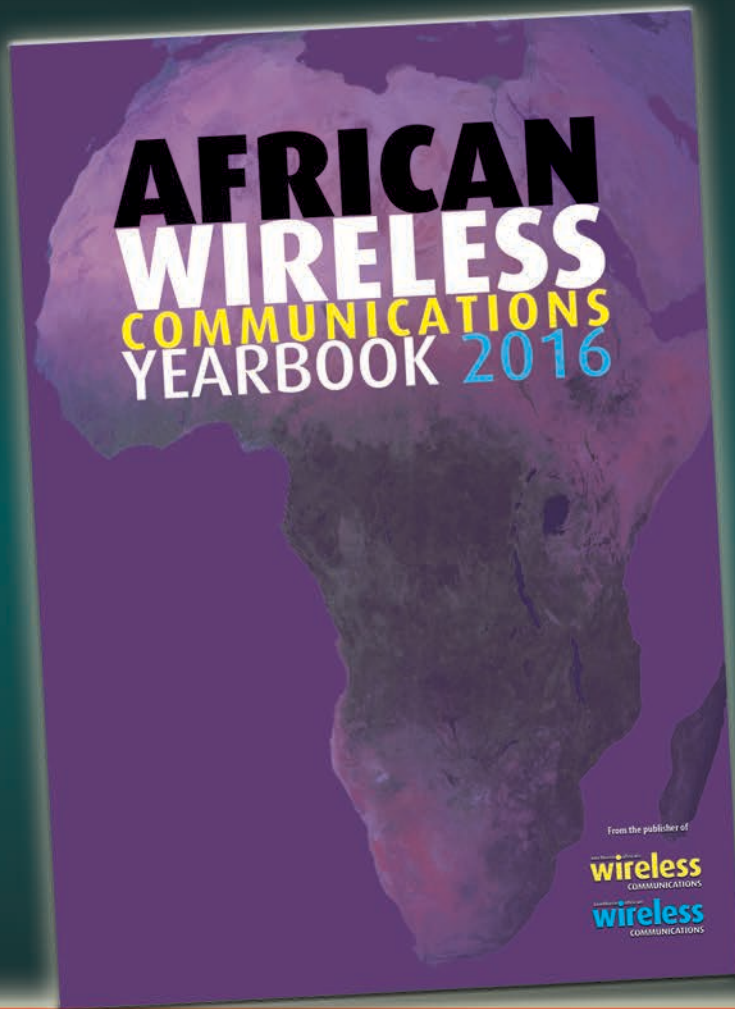
Muhammed Rafeeque, the firm's assistant manager IT, headed the technical team at the record-breaking event. "We used an *AER2100* router to provide the connectivity between the radio studio and the outside broadcast location. It was critical to have uninterrupted uptime to ensure that the record was achieved."

Tolan beat the previous record of four hours and 33 minutes set by a UK radio station. He achieved the feat in the aquarium at Dubai's Atlantis Palm Resort on 13 May, and was submerged three metres below the surface in the 11 million litre tank as he played music, conducted interviews, and talked to his listeners while surrounded by 65,000 marine animals, sharks and stingrays.