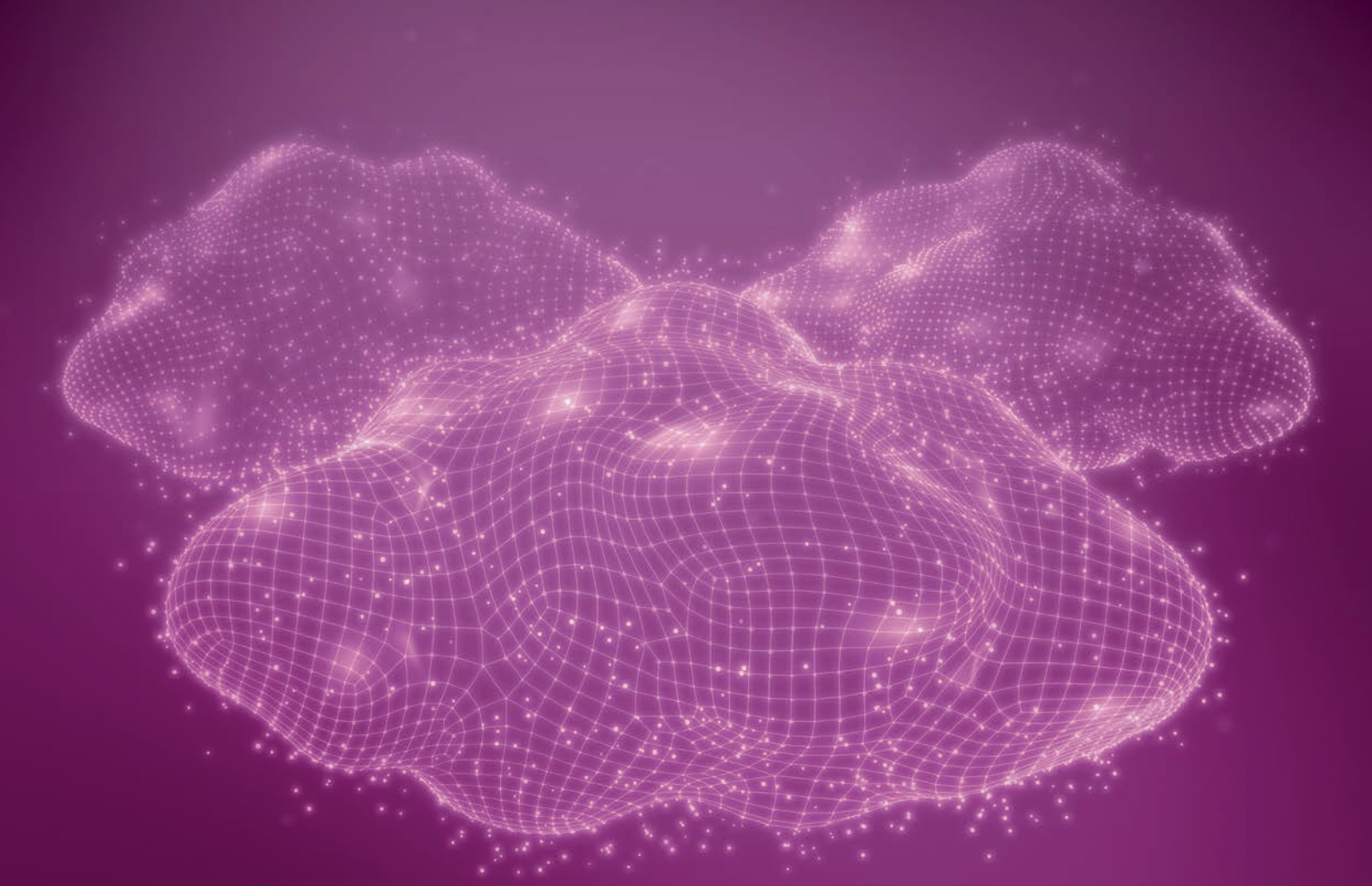
AUGUST/SEPTEMBER 2017
Volume 16
Number 4

northern african wireless COMMUNICATIONS

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

- 4G: not so fast in Africa?
- Connecting users in the health sector
- Creating networks for the web-scale era



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February 2017: Ooredoo Tunisia lands in Sparkle's Sicily Hub in Palermo and expands reach across Europe.

Ooredoo's multiservice PoP in Sicily Hub will serve as main European point of presence, offering an enhanced data experience for consumers and businesses and providing direct access to new markets in highly growing regions. Discover Sparkle's Cloud & Data Center Platform, an interactive ecosystem based on a global communication network in constant evolution. Its governance ensures the creation of value for customers, suppliers and partners, every day, before they even know they need it. Because we're always looking ahead.

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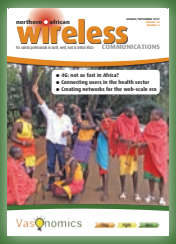

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This cover is dedicated to the spirit of entrepreneurship and the dream of a digital Africa.

We are pleased to present to you one such dreamer, who started his African adventure with less than USD7,000 in his hand and has today connected some 250 million SIM cards with super returns from high-risk markets in sub-Saharan Africa, and who has reinvested the USD6.5m he has made so far.

The year was 2010 when Mr Vikas Dixit, founded Vasonomics in Nigeria, with a mission to connect the unconnected and provide low-cost, meaningful and life-changing feature & smartphone-based apps for bottom of the pyramid customers.

Today his first product, StoryBox, is a major revenue spinner for leading cellular networks in Nigeria, Kenya, Uganda, Tanzania and is being deployed in major markets in the region. With the success of StoryBox, more voice, SMS, USSD products soon followed and there are 8 to 10 data products due for release by Vasonomics this year including Topup & Wallet, Video Streaming and iGaming apps.

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Turn to page 12 to find out more.

KADIUM

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Digitata Networks expands existing offering to enable a subscriber-centric view of mobile networks

Digitata Networks offers a range of software products developed to control, monitor and automate all major mobile technologies (2G, 3G, 4G and WiFi) across the different domains within a telecommunications network (Subscriber, RAN, Core and TX). These vendor-agnostic products include Configuration Management, Performance and Revenue Monitoring and Asset Tracking. With the recent acquisition of NetTrax from RanWorx Solutions (rebranded to NetCE), Digitata Networks is able to also offer Mobile Network Operators a subscriber-centric view of their network performance.

"The synergies between the newly-acquired NetCE and Digitata Networks' existing solutions ensure a combined offering that will be of great benefit to our current and future customers. The addition of NetCE gives Digitata Networks the subscriber component that the Digitata group is proud to support in all of its product streams."

Philip Korf, **CEO: Digitata Networks**

About NetCE

Customer Experience App
NetCE is a Customer Experience app residing on subscriber handsets. It monitors the customer's experience of the network and reports back to a centralised server for further analysis by network engineers.

Passive Monitoring
For subscribers, the app runs in passive monitoring mode. It collects data about call quality, call drops etc, in the background without the subscriber doing anything. This data is then sent to a centralised server.

Online Analysis
Data collected from subscribers can be viewed and analysed by an engineer on an online portal. This includes reports on the different events in tabular, graphical and geographical formats.

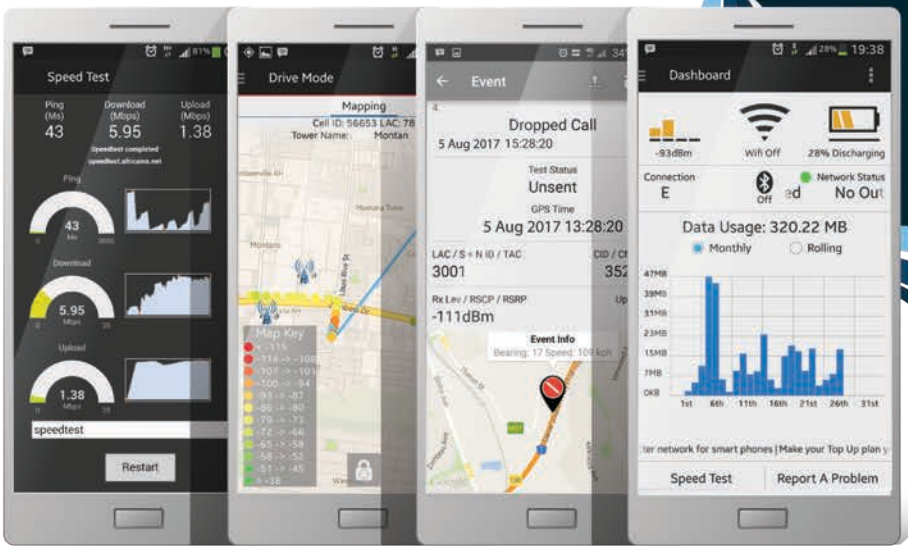
Crowd Sourcing
If many subscribers install the app, the operator essentially has a team of network quality testers. If multiple people in the same area experience similar problems, engineers can react quicker to fix the issues.

Drive Tests / Active Monitoring
Engineers can use the app in active monitoring mode for drive tests. Data is collected along the route and uploaded to the centralised server for analysis of problem areas.

Customer Complaints
Customers can also log specific complaints directly on the app, and receive feedback on these complaints too.

digitata networks

www.digitata.com



Contact us at
info@digitata.com

NetCE

Liquid Telecom upgrades fibre ring to 100G

Liquid Telecom has completed 100G upgrades to key routes on its East Africa Fibre Ring. The operator says the enhancement to its pan-African fibre network that now stretches more than 50,000km enables it to offer the largest lit backhaul capacity on the continent.

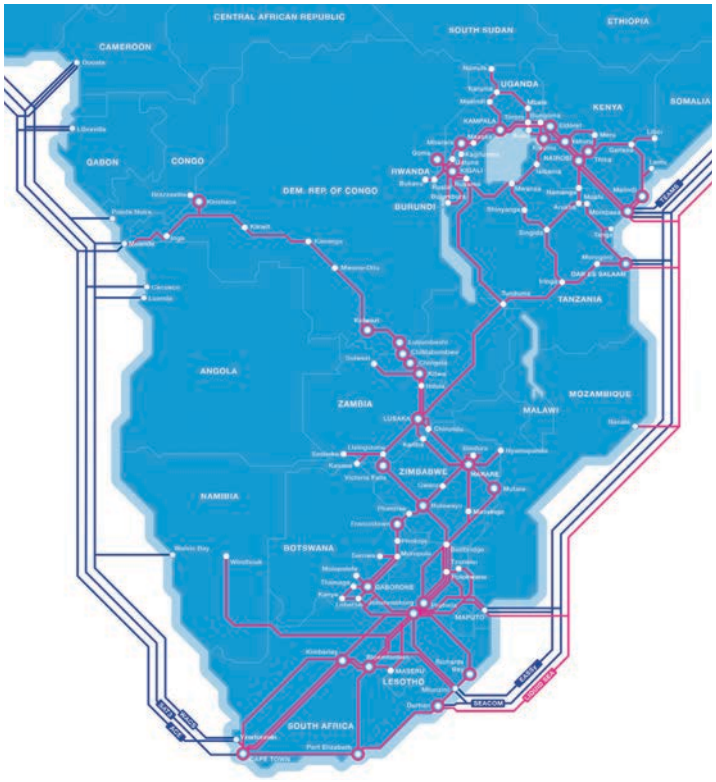
The upgrade to 100G wavelengths takes advantage of the latest DWDM technology from Ekinops. Liquid says it delivers up to 10 times the speed of previously used 10G waves.

The 100G links are available in the cities of Kigali in Rwanda, Kampala and Tororo in Uganda, and Nairobi and Mombasa in Kenya, with further 100G upgrades planned for the East Africa Fibre Ring in the near future.

Liquid Telecom group CEO Nic Rudnick says: "By upgrading to 100G, Liquid Telecom is ensuring that its fibre backbone can meet the rising demand for high-bandwidth, video and internet services from businesses and consumers across the region."

Liquid claimed it had made history when it announced the completion of the *East Africa Fibre Ring* in 2014 *(see News, Jun-Jul 2014).* Built at an initial cost of USD20m, the network connects Kenya, Uganda, Rwanda and Tanzania, with onwards connectivity to Liquid's fibre networks in Burundi and eastern DRC. It also offers direct access to international subsea cables.

The company says it remains the first fully redundant regional fibre ring with multiple routing options ensuring that customers are not affected by fibre cuts and network outages. "In the event of an incident, internet traffic is automatically and instantly re-routed around the ring, giving consistently high speeds and continuous uptime for customers," states the firm.



The East Africa Fibre Ring now spans 50,000km. The upgrade means users in Rwanda, Uganda and Kenya will be able to experience 100G network connectivity for the first time.

Progress made in bringing electrical power to Africa

More than 50 million people on the continent can now access electricity for the first time, according to Power Africa.

As has been well documented, a lack of reliable electricity is a major obstacle in emerging markets and is one of the key challenges faced by mobile operators when it comes to expanding networks to remote and rural communities.

Launched in 2013, Power Africa is a US government-led initiative to double access to electricity in sub-Saharan Africa, and is claimed to be one of the world's largest PPPs in development history. It consists of more than 150 public and private sector partners which have collectively committed more than USD54bn towards achieving the initiative's goals. The aim is to increase installed generation capacity by 30,000MW and add 60 million new electricity connections by 2030.

In its annual report published in August 2017, those behind Power Africa state that the programme continues to lay the foundation for sustainable economic growth in Africa while creating opportunities for American businesses.

Netsanet Kinde works on one of the solar home systems that she designed in her workshop in Addis Ababa. PHOTO: NBK ELECTRICAL CONSULTING ENGINEERS

It says that since 2013, Power Africa has facilitated 80 financing agreements valued at more than USD14.5bn with projects that have generated more than USD500m in US exports. These are expected to generate more than 7,200MW of power across the region. This is in addition to the more than 10 million electrical connections that have been facilitated by the project which have brought electricity to millions of people for the first time.

The report also highlights the role of women in Africa's power sector. For instance in 2016, microelectronics engineer Netsanet Kinde won a USD100,000 grant from the Power Africa Off-Grid Energy Challenge. Kinde has developed the first solar home system designed for Ethiopians, by Ethiopians. Using her electrical engineering background, she has designed a solar home system that includes two lamps and a charging system for devices, such as mobile phones and radios. According to the engineer, off-grid systems that are independent of the national grid are an essential part of the solution for rural electrification.

Over the next year, Power Africa says it plans to work with more than 100 US companies, African partners, donors and the private sector to harness the technology, ingenuity, and political will necessary to bring the benefits of modern energy to even remote parts of Africa while promoting economic growth. The initiative will also expand beyond its initial focus on solar lanterns and renewable energy to support more on-grid power projects in natural gas and other sources.

New launch date set for *Intelsat 37e* after anomaly

The launch of the fifth of Intelsat's next-generation high throughput satellites has now been re-scheduled following an earlier failed attempt.

Intelsat 37e was due to go up from French Guiana on board Arianespace flight VA239 together with its co-passenger, Japan's *BSAT-4a*, on 5 September. But the launch was stopped due to an "out of specification condition" on the launch vehicle.

The following day, Arianespace said: "Just after the ignition of *Ariane 5*'s main stage *Vulcain* engine, the on-board computer detected an anomaly affecting electrical equipment on one of the two solid-propellant boosters (EAP). This anomaly led to an interruption of the automated lift-off sequence."

The electrical equipment has now been replaced and after carrying out all related checks Arianespace said that it was planning for a launch as "early as possible". At the time of writing, this was scheduled for 29 September.

Intelsat says *Intelsat 37e*'s payload represents a significant evolution of its *EpicNG* platform. Built by Boeing, the all-digital satellite has full beam interconnectivity in C-, Ku- and Ka-bands, and also includes enhanced power sharing technology and steerable Ku- and Ka-band beams. It will be used by broadband, mobility and government customers in the Americas, Africa and Europe.

Intelsat 37e will be placed into service at 342°E where it replaces *Intelsat 901* which will be repositioned to another location.

An anomaly was detected just after the ignition of the *Ariane 5* rocket's main engine.

Safaricom aims for rapid FTTH rollouts with Huawei's help

Safaricom is planning to enter the home broadband market in Kenya. It is using Huawei's help to rapidly deploy FTTH and expand its capability to new domestic broadband services.

While Kenya has a steadily developing economy, its fixed broadband penetration rate is said to be lower than one per cent. Safaricom director Thibuad Rerolle says: "By using Huawei's E2E [end-to-end] solution, we can quickly build the FTTH network. We are keen to broaden the development space for new fixed broadband services."

According to Huawei, among the challenges Safaricom faces are scattered user distribution, high network construction costs, and low early phase service provisioning rates and revenues. For cost-effective and precise investment, it says the operator is using analytics to determine network rollout in line with customer demand as its first step.

The company adds that for fast network construction through infrastructure synergy and engineering innovation, Safaricom can fully utilise existing MAN optical cables and preferentially use aerial cables. Through the synergy of fixed broadband optical distribution networks and mobile backhaul networks, Huawei says the cellco can deploy mini optical line terminals and wireless base stations in the same cabinet. It claims this will result in fast deployment, centralised home access, and greatly decreasing network construction costs.

Furthermore, Huawei reckons its "lightweight" mini OSS helps Safaricom to reduce the system integration period and complete deployment within only three months as opposed to 18.

The vendor has also provided a smartphone app for engineers. It's claimed this integrates installation, maintenance and operations, supporting on-site service provisioning and acceptance, shortening service provisioning period from two weeks to less than 48 hours, and doubling installation rates.

Ooredoo to use iBuildNet to design its indoor networks - News, p8

Societe Generale targets a million mobile wallets with YUP

Societe Generale, said to be one of Europe's largest financial services groups, has developed a mobile money solution for Africa that is claimed to already have more than 30,000 open wallets and nearly 600 agents.

Following its earlier introduction in Côte d'Ivoire and Senegal, *YUP* is now planned for launch in Ghana by the end of this year, and Cameroon, Burkina Faso, Togo and Guinea in 2018.

Societe Generale says *YUP* is a mobile money solution for accessing a full range of transactional and financial services even without a bank account. Based on a network of third-party agents with whom the bank has formed partnerships (such as service stations, for example) the service is accessible via an expanded network of distributors equipped with adapted terminals. It is also available using the mobile apps of Societe Generale's different banks throughout Africa.

The service has already been launched in Côte d'Ivoire and Senegal and is based on a network of third-party agents.

YUP is aimed at customers with or without bank accounts, and for anyone with any type of mobile phone, regardless of which operator they subscribe to. Users can withdraw, deposit and transfer money, pay bills, buy phone credit and make retail payments. The solution also digitises corporate payment flows, and financial services such as payday advances, credit, savings products and international transfers will also soon be added.

Societe Generale created the service in partnership with African startups as well as with Tagpay, a French fintech in which it is a shareholder. Tagpay has developed NSDT (near sound data transfer) contactless authentication technology, which is claimed to be innovative and more intuitive for users than existing solutions on the market.

Societe Generale's ambition is to open one million wallets by 2020 and expand its network by hiring 8,000 agents over the same period.

Why USSD won't replace apps for a while (and why banks must offer both) – On The Network, p8

Vodafone Egypt uses NVF-based platform to manage mobile video

Vodafone Egypt will use an NFV-based solution to enhance subscriber QoE and manage rising video traffic.

With a customer base exceeding 40 million subscribers, Vodafone Egypt is experiencing growing demand for mobile data, much of which is being driven by video streaming. As a result, the company needed a flexible solution that could handle all traffic types and maintain a greater mobile data experience for its users.

The operator will use Openwave Mobility's software for accelerating download speeds and handling encrypted video. It will also deploy the vendor's cloud-based subscriber data management platform.

Osama Said, Vodafone Egypt's technology director, says: "Openwave Mobility's technology allows us to effectively manage all our streaming data, including encrypted video, resulting in a very positive impact on subscriber QoE."

Openwave Mobility provides solutions for IP traffic management, mobile data acceleration, targeted promotions and subscriber data management. The US-headquartered company claims its cloud-based software is the only solution in the industry to manage HTTPS, Google's QUIC and Facebook's 0-RTT video delivery platforms. Based on what it reckons is the "most scalable" NFV platform currently available, the firm says its solutions alleviate RAN congestion, create new revenue opportunities, and unify subscriber data.

Djibouti Telecom to peer through French IXPs

Djibouti Telecom will peer its IP traffic through France-IX's IXPs in Paris and Marseille. The state-owned telco says the agreement will mean its network customers will benefit from a significant improvement in QoS with faster and more stable access to a large amount of French-language content.

For Djibouti Telecom's IP transit services customers, France-IX says the connection to its IXPs opens up an alternative route and allows them to optimise their traffic. It claims that for some destinations, this can "significantly" shorten data travel distance and improve response times. The firm says this is possible thanks to a direct traffic exchange with other networks and on-demand content providers via a 10Gbps port at its facilities in Paris and Marseille.

Djibouti Telecom DG Mohamed Assoweh Bouh believes peering in Paris offers advantages in terms of access to content and IP transit. He adds that Marseille is a "natural destination" for the company as it offers a European landing point for new subsea cables such as Asia-*Africa-Europe 1* and *South East Asia-Middle East-Western Europe 5*, in addition to its existing capacity on *Europe-India-Gateway* and *SEACOM*.

"This agreement will not only benefit our final customers but also a number of African service providers, network providers and carriers based in Ethiopia, Somalia, Yemen, Madagascar, Mauritius and Seychelles that use Djibouti Telecom as a hub," says Bouh.

France-IX says that for its existing peering community, the new connection paves the way for additional customers and allows them to offer their services under "satisfactory" technical conditions.

iPLANS goes OTT to give Cameroon a new voice

iPLANS is planning to launch a VoIP service in Cameroon that offers inexpensive and high-quality international calls and texts.

Established in 2006, iPLANS is a provider of software, hardware and hosting solutions. Earlier this year, it became the first new operator to be granted a voice license as part of the government's *Cameroon Digital 2020* programme.

The company has developed an OTT app called *perfectTalk* and set up numbers through which the new VoIP service can be accessed. As well as using the free app, consumers can pay for calls through the various mobile money services available in Cameroon, as well as pre-paid cards.

World Telecom Labs (WTL) supplied the switches to help iPLANS build its VoIP network. The operator has also customised WTL's web-based *Pay & Call* e-commerce portal for automated customer creation and self-care. It's claimed this provides iPLANS' customers with a straightforward way to set up their accounts and manage payments online.

The operator says it will initially focus on making it easier and cheaper for people living, working and visiting Cameroon to make and send calls and texts to other countries, both within and outside Africa. In the near future, the service will also be available to the Cameroonian diaspora, particularly those in the UK, Belgium and US.

iPLANS' CEO Joseph Kamgue says: "I firmly believe that we should develop innovative solutions to help our country grow here in Cameroon. This is the best way to build a culture of creation, education and skills."

Brian Richardson, co-founder, WIZZIT International

ON THE NETWORK

Why USSD won't replace apps for a while

Despite predictions by some financial service providers (FSPs) that app-powered banking would usurp USSD, the latter remains the most successfully integrated and widely adopted technology in emerging markets.

What makes USSD so popular and usable is the ability to access it from any mobile, not necessarily a smartphone within data range as with app-based banking. And of course, not every customer has a smartphone and most won't have Wi-Fi connectivity in more rural or inaccessible areas.

MNOs have most notably leveraged USSD to offer VAS to customers. This has won them favour with new and emerging markets as the technology, while perhaps not as elegant as app-powered mobile banking, is relevant and inclusionary.

USSD is smart, quick and safe, which are three integral benefits FSPs should be offering customers in a mobile banking service.

But the power of USSD doesn't render app-based banking redundant – they're different offerings for very different customers and market segments. Some customers might have one, some might have both.

The key takeaway for FSPs is to avoid assumptions made on the part of new and potential customers in emerging markets. Understanding the needs and wants of the untapped market requires extensive research.

So it remains equally important for FSPs to develop app-powered mobile banking services. There are a number of notable benefits for consumers, such as the use of biotechnology for security, for example. And the range of services that can be offered through app-based mobile banking – which go so far as to replace desktop online banking – is extensive.

It's not a case of one or the other. FSPs who are agile enough to offer both will reap the rewards.

TCCA has BIG idea to support broadband

The TCCA (TETRA and Critical Communications Association) has formed a new working group to encourage broadband vendor cooperation in the development of common global critical communications solutions.

The Broadband Industry Group (BIG) will drive market adoption of standardised critical communications LTE and subsequent 5G technologies for the benefit of critical communications users and organisations. It also aims to promote an evolutionary approach towards future solutions.

The TCCA says this work will build on its achievements of driving and supporting open standards and interoperability, and ongoing research into professional users' requirements to protect customer investments for the long term.

"With the formation of the BIG, TCCA has provided industry a home to advance critical service based on broadband, including migration to 3GPP LTE and 5G standard technologies," says TCCA chief executive Tony Gray. "In parallel, we will continue to recognise the importance of narrowband PMR, and model our broadband activities on the success of those technologies in supporting professional users worldwide. This success will be further strengthened by the evolution of interworking between critical narrowband and broadband technologies."

Ericsson's Jason Johur (pictured left) says BIG will focus on ensuring 3GPP-compliant products and services meet the evolving needs of all critical comm users. Also pictured is the group's chair, Philippe Agard. PHOTO: Erillisverkot

Philippe Agard, Nokia's global public safety and defence segment leader, will chair the new Broadband Industry Group (BIG). He will be supported by Jason Johur, Ericsson's market development director for mission-critical communications, as vice-chair.

According to Nokia, organisations across key vertical markets have been expressing the need for an evolution from narrowband PMR towards broadband. It says that as the first networks are rolled out, BIG will help open up a broader worldwide ecosystem."

Ooredoo to use *iBuildNet* to design and optimise its complex in-building networks

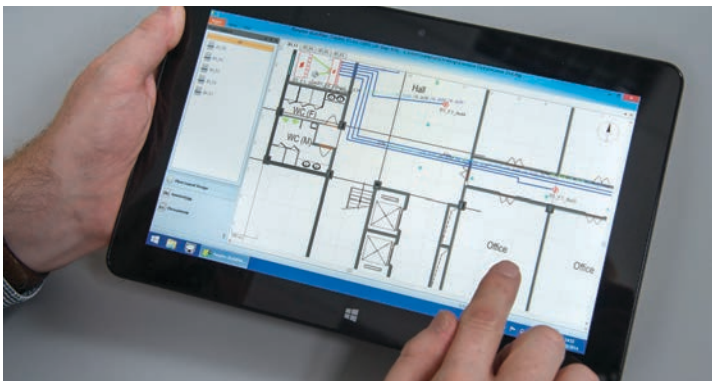
Ooredoo will use Ranplan's RF indoor planning tool for the design and optimisation of complex in-building networks across its global footprint.

Based in Qatar, Ooredoo runs mobile networks in the Middle East and Asia, and in Northern Africa it is present in Algeria and Tunisia.

Dr. Robert Joyce, group head of radio access technology, says partnering with companies such as Ranplan are part of the operator's efforts to enhance its customers' data experience and enable them to enjoy the internet more. "Ranplan's state-of-the-art RF indoor planning solution will help us design our indoor networks in offices, shopping malls, underground rail systems, stadia and many other facilities, and will enable us to keep pace with growing coverage needs and all the complexities that come with 5G and the Internet of Things."

Ranplan reckons its *iBuildNet* planning tool provides unique simulation capabilities for multiple network services at a mobile device level. It says that this assists RF engineers in evaluating QoS, even in the "most complicated" deployments.

The firm's CEO Alastair Williamson says: "In addition to dealing with complex structures, terrains and materials, radio planning for indoor environments must also take into account issues such as interference with macro cells and support for multiple-system technologies."



iBuildNet can be used as an automated on-site tool to enable installers to quote, plan, deploy and optimise a network.

iBuildNet includes 3D modelling with what's described as a "fast and accurate" 3D ray-tracing propagation engine. It is also said to feature "powerful" data analysis to automatically optimise AP locations, antenna type, power and channel assignment for dense DAS, small cell and hetnet deployments. Williamson claims the tool has been proven to reduce the cost of designing and implementing such networks.

Guichet Unique to roll out in Africa

Senegalese fintech firm InTouch will work with global integrated energy producer Total, and transactional services specialist Worldline, to bring a new mobile payment solution to the continent.

Guichet Unique ('single window' or 'one-stop shop') has been designed to provide retail networks with what's claimed to be a "unique customer-friendly" device that makes it possible to securely and seamlessly accept all means of payments, including mobile money, cards, as well as cash. The system also enables retailers to distribute third-party services, such as subscriptions to media content, bill payment, money transfer, card top-up, banking and insurance.

Under the agreement, Total and Wordline will support the implementation of the *Guichet Unique* platform in Burkina Faso, Cameroon, Côte d'Ivoire, Kenya, Mali, Morocco and the Republic of Guinea. It is already installed in more than 170 Total service stations and more than 600 independent points of sale in Senegal, where the platform is said to manage more than 30,000 transactions per day.

InTouch is now targeting deployments to more than 5,000 retail network and independent points of sale in the above mentioned African countries. As part of the agreement, Total and Worldline will fund the first phase, and will also become shareholders in InTouch alongside its founder Omar Cissé.

As well as providing its payment expertise, Worldline says it will provide secure, enterprise-class hosting infrastructure to support the rollout and operation of *Guichet Unique*.

iSAT and Thaicom partner for services

Thaicom is providing iSAT's key customers in East Africa with fully managed telecoms services via satellite, including backup of its fibre network.

Part of the UAE-based Wananchi Group, iSAT Africa specialises in broadcasting, data and internet services. As well as offering teleport facilities, it runs fibre networks that cover Africa, Europe, Asia and America.

In the event of the company suffering any fibre network outages, Thaicom will provide IP connectivity using its *THAICOM 6* satellite. The Thailand-based operator says the full-time, managed service will enable iSAT to offer its clients a fully redundant and "highly available" backup solution for the provision of uninterrupted broadband services.

Thaicom adds that its services are based on a point-to-point satellite link between its designated teleport and iSAT's remote site, thus providing uninterrupted access to the network.

iSAT CCO Munish Sharma reckons the collaboration will help meet growing demand and offer data services through a resilient fibre network, while maintaining "high" QoS standards.

Sub-Saharan Africa driving global mobile money

Sub-Saharan Africa accounts for more than half of all mobile money deployments worldwide, according to the GSM Association.

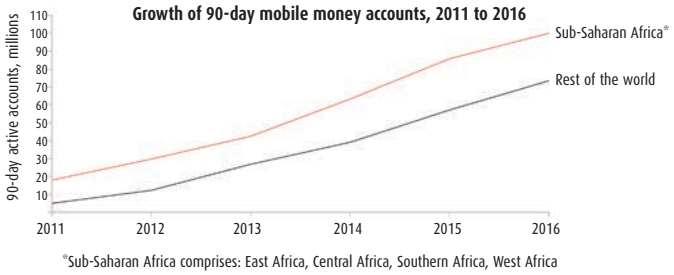
In its latest *State of Mobile Money in Sub-Saharan Africa* report published in July, the GSMA says the number of live mobile money schemes in SSA reached 140 across 39 countries at the end of last year, accounting for more than half of the 277 mobile money deployments globally. It says that there were 277 million registered mobile money accounts across SSA at the end of 2016, plus 1.5 million registered agents.

According to the report, there are now seven markets in SSA where more than 40 per cent of adults are active mobile money users: Gabon, Ghana, Kenya, Namibia, Tanzania, Uganda and Zimbabwe.

It adds that the region is pioneering a range of new use cases where mobile money has evolved from primarily being used to top up airtime and make P2P transfers, to becoming a platform that enables additional financial services, including bill payments, merchant payments and international remittances.

The GSMA says the volume of these new types of 'ecosystem payments' almost quadrupled between 2014 and 2016, and now accounts for about 17 per cent of all mobile money transactions, driven by a significant rise in the number of mobile-based bill payments.

The association's director general Mats Granryd says: "Mobile money is now achieving mass-market adoption in all corners of sub-Saharan Africa, enabling millions of people to access financial services for the first time and contributing to economic growth and social development."



Mobile money account adoption in sub-Saharan Africa has outpaced growth in the rest of the world (note, Rest of the world excludes SSA).

SOURCE: 2016 THE STATE OF MOBILE MONEY IN SUB-SAHARAN AFRICA, GSMA

Enhanced *M-PESA*

Safaricom has upgraded its *M-PESA* platform. In August, the operator announced the availability of revamped APIs for the service, providing the capabilities for anyone to build and deploy their solutions on top of the platform. Safaricom says these enhanced capabilities for developers will "usher in an age of increased interconnectivity for *M-PESA*, which will support a wider range of capabilities for several different partners. It adds that the platform will also allow the gradual introduction of new features in coming months.

GlobalTT upgrades

Belgium-based GlobalTT has completed an upgrade of its inbound C-band service which offers pan-African coverage. The VSAT operator says it now offers 2Mbps using a 'regular' modem or 3Mbps using a 'professional' one. It adds that download capacity is still up to 30Mbps. GlobalTT has also upgraded its inbound Ku-band capacity that is also said to offer satellite connectivity anywhere on the continent. The service works using a small 1.2m dish and is now said to offer more than 1Mbps upload speeds as well as up to 30Mbps downloads.

Africa-wide domain

More than 8,000 companies and individuals on the continent are said to have so far registered for the new *.africa* internet address. Lucky Masilela, CEO of the ZA Central Registry (ZACR) which is responsible for administering the domain name, describes *.africa* as "valuable virtual real estate". He says: "Leading continental and international brands are snapping up *.africa* domain names because they recognise the importance of being associated with Africa's bright future online."

Tola.wallet helps reconcile transactions

Tola Mobile says it has enhanced its mobile payments platform to provide business continuity and operating resilience for merchants in Africa.

Designed to give customers a seamless mobile payments experience, the company says its *Tola.wallet* mobile money system can now reconcile transactions that would previously have been delayed or even potentially lost when mobile network outages and downtime occurred.

Tola Mobile CEO Shane Leahy says: "During this downtime, *Tola.wallet* enables merchants to continue operation, buffering the systems until they are operational again and ensuring that there is a full and complete reconciliation of mobile money transactions once operator services are available again."

Headquartered in the UK and with offices in Tanzania and Kenya, Tola Mobile says *Tola.wallet* enables companies looking to receive payments from mobile money throughout Africa. It says a single API connection allows organisations to receive and make real-time payments across countries at the same rates as bank or credit card transactions.

The firm claims *Tola.wallet* is already the fastest-growing mobile money solution in sub-Saharan Africa. It says that the platform has so far processed 100 million transactions across the region, equating to funds valued at more than USD75m.

Real-time cross-border money transfers

TerraPay and Instant Cash have teamed up to enable real-time cross-border money transfers to mobile wallets.

A B2B company incubated by Mahindra Comviva, TerraPay has developed an interoperability engine to enable real-time transactions to be sent and received across diverse payment platforms and regions.

In an initial rollout, TerraPay has enabled Instant Cash customers to send remittances to mobile wallets in Tanzania as well as in Nigeria and Uganda.

In Tanzania, they will be able to send remittances directly to *Vodacom M-Pesa*, *Tigo Pesa*, *Airtel Money* and *Zantel Ezy Pesa* wallets. In Nigeria, they can send money to any mobile number as well as bank accounts, while in Uganda, funds can be sent directly to MTN and Airtel mobile money wallets.

The service is expected to expand shortly to other African countries that have a very high adoption of mobile money. Philip C. Daniel, acting CEO, Instant Cash, says: "We are looking at expanding our customer base in Uganda, Nigeria and Tanzania through this strategic partnership. This means we are now able to widen our mobile money wallet reach into relevant African markets that have expat populations in the GCC."

Instant Cash is a UAE government-owned money transfer company with a network of more than 250,000 locations across the globe. It has offices in Kenya as well as in the Middle East and Asia.

Moving Wireless Forward

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

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

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

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

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

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

Asset Tracking & RFID

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

MobileMark
antenna solutions

We are now looking for distributors throughout Africa

Commercial Fleet Management

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

Public Transit & Bus Management

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

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

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

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

Remote Monitoring & Surveillance

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

Mining & Exploration

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

Smart Cities & Smart Highway

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

Let us know how we can help

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

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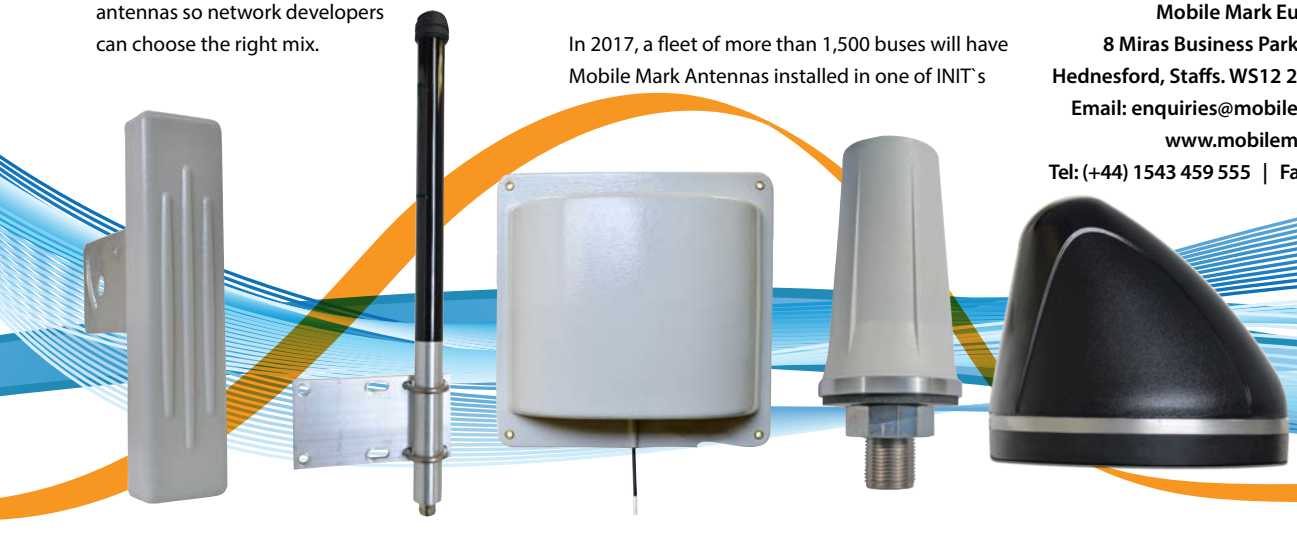

Come see us at AfricaCom 2017 on stand B44

Vasonomics
Play Fight Win

Building a digital Africa, one SIM card at a time…

Headquartered in Lagos, Vasonomics was founded in 2010 by African telecoms entrepreneur Vikas Dixit, who is die-hard and passionate about Africa.

We are on a mission to connect and transform at least a million African lives by providing MNOs with highly-localised, low-cost mobile entertainment and informative services for their end users.

Vasonomics does this by leveraging its team's extensive experience in African markets and knowledge of the local ecosystem, and by developing exclusive local content and strong partnerships with local market participants.

We are now poised to become a leading VAS, SaaS and CaaS (Content-as-a-Service) provider to major telecom operators in West and East Africa.

Our offerings include IVR (interactive voice response) applications as proprietary content, as well as services for:

- Festivals & events
- Health & lifestyle
- Ringtones & music
- Farming
- Contests, news & information
- Customer gratification
- Loyalty management (lottery based) genres

The company also offers **subscription engines**, **managed outbound diallers** as well as **SMS** & **USSD** applications to complement an MNO's voice strategy.

By using out SaaS products, MNOs can enhance their ecosystems with intelligent, interactive, innovative, real-time transactions, and thus automate their processes. This in turn brings value to the entire chain, impacting the revenue and profitability of the operator's partner.

Today, Vasonomics has **1 million-plus active** mobile customers, a database of 1.7 million, and the potential to reach some 250 million mobile consumers with Direct Charging Connectivity in major emerging markets.

We currently have customers in Nigeria, Kenya, Uganda, Tanzania, Bangladesh, UAE and Afghanistan. So far, we have helped some of them sell USD300,000 worth of digital goods **per month** across Africa's mobile ecosystems.

Vasonomics targets markets in East, West and Central Africa that lack development infrastructure such as power, logistics and internet, and are characterised by relatively higher average revenue per unit (much more than Asia), moderate teledensity (40-60%), high population, and political volatility.

It is these gaps in the development infrastructure that have inspired Vasonomics to get inside sub-Saharan African markets. And as well as doing its bit to help the region catch up with the rest of the world, the company also creates a profitable business out of this disparity.

Recently, Vasonomics has strategically invested in one igaming company, Creatiosoft, to make a plethora of real-time igames available to telcos.

Find out how Vasonomics can change your business:

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Africa leads way in network sharing

Nigeria is the most successful network sharing country in the world, according to IHS Markit's latest *Mobile Infrastructure Market Tracker* report.

The analyst says Africa, India and Latin America are three regions where network sharing has been working well. It points out that although India pioneered network outsourcing in 2005 and has since moved fast to network sharing and managed services, it is EMEA that is now leading this area with network sharing deals across Eastern Europe and Africa.

"We can't really pick a particular country because consolidation among service providers led to pan-African shared networks," says Stéphane Téral, IHS' executive director of research and analysis, mobile infrastructure and carrier economics. "However, in Africa I think Nigeria, the most populous African [nation], is the most successful and innovative telecom infrastructure country."

IHS says that as service providers all over the world operate in saturated markets, they increasingly focus on customer satisfaction and retention, and on business and network transformation. These require increasing dedicated resources.

However, the analyst adds that because significant revenue growth may no longer be achievable, it is necessary for MNOs to "de-emphasise" network operations through outsourcing, managed services, and network sharing to preserve margins and sustain cash flow.

In its latest tracker report, IHS identifies a number of trends that it is seeing in infrastructure sharing in emerging markets. As well as EMEA leading the way here, it says Africa-based IHS Towers is the largest company of its type in emerging countries and is contributing to the success of Nigeria.

IHS Market analyst Stéphane Téral believes Nigeria is the most successful and innovative telecom infrastructure country.

IHS predicts that more towercos will emerge in the future because of market saturation putting pressure on revenue growth for cellcos. It says: "More and more service providers will sell their towers to companies like IHS Towers, which is in a strong position to keep growing. There is also the opportunity for others to create competition in the tower business."

The analyst also believes that NFV will provide the next wave of operational efficiencies in network sharing. "By moving more network functions from hardware to software, using off-the-shelf IT components and platforms, the cost of network nodes decreases and new services can be turned up and down at the power of a click. Overall, with the concept of network slicing, it will become easier to share networks among several service providers."

Millicom signs new agreement to sell its Senegal business

Millicom has terminated its agreement to sell its Tigo operations in Senegal to Wari Group, the Dakar-based provider of mobile and digital services.

Following the announcement made in July, the telco issued a second statement in early August saying that it wanted to make the corrections concerning the termination of the agreement after what it claimed to be "incorrect and misleading" claims made by Wari.

The statement said that the sales agreement signed on 2 February 2017 between Wari and Millicom set 2 June 2017 as the deadline for Wari to provide the funds required as part of the transaction. In the event of Wari not complying with the financing requirements, the agreement granted Millicom the right to terminate the process immediately upon notification.

On 28 July, almost two months after the deadline, Millicom said that Wari had still not provided the financing required. It therefore notified Wari of the termination of the transaction, and added that subsequent claims mentioning an ongoing due diligence process were also incorrect, as no such process was outstanding as part of the sales agreement.

Separately, Millicom also announced that it has signed an agreement to sell its Senegal operations to a consortium consisting of NJJ, Sofima (the telecoms investment vehicle managed by the Axian Group) and Teyliom Group, subject to customary closing conditions and regulatory approvals.

NJJ is the private holding company owned by French telecoms entrepreneur Xavier Niel. Incorporated in France, NJJ holds various stakes in a broad range of operations in Europe and the USA. Niel is the founder and main shareholder of Iliad, the parent company of Free in France.

Owned by the Hiridjee family, the Axian Group specialises in infrastructure and services in Indian Ocean countries and Africa. It has interests in energy, financial services, property, as well as in telecoms through Telma, Tom, TRM and Telco OI.

Teyliom is said to be one of the precursors of mobile telephony in Africa and has been active in the sector since 1996. Focused on West and Central Africa, it is now a diversified investment holding group whose interests include, amongst others, a seven per cent stake in MTN Côte d'Ivoire.

Hytera and Motorola lock horns in patent disputes

Motorola Solutions is taking further legal action against Hytera *(see Wireless Business, Apr-May 2017 issue)*. But the Chinese firm has now also filed complaints against its US rival, accusing it of patent infringement.

As part of its ongoing dispute, Motorola Solutions has filed new complaints with the regional court of Mannheim in Germany that also target Mobilfunk, Hytera's German operation.

Motorola alleges that Hytera's two-way wireless communication devices with improved squelch functionality are infringing its European patent number EP1139562 B1. It is seeking an injunction preventing the company from offering and delivering products with this squelch feature in Germany, as well as the recall and destruction of what it describes as "infringing" products and various damages.

With these additional actions in Germany, Motorola now has five pending IP litigations against Hytera. They include separate patent infringement and trade secret misappropriation complaints filed with US authorities in March, and a complaint previously filed with the regional court of Düsseldorf in April.

Mark Hacker, general counsel and chief administrative officer of Motorola Solutions, says: "We are confident that the steps we are taking globally will be effective in stopping Hytera's unlawful conduct."

Hytera has so far responded by accusing Motorola Solutions of infringing its patent that covers its sound adjustment control technology.

On 28 August, the firm announced it had filed a lawsuit in a federal district court in Ohio stating that Motorola was infringing its US patent number 9,183,846. The complaint asserts that Motorola "unlawfully misappropriates" Hytera's patented technology for sound adjustment, incorporating it into its *MOTOTRBO* portable radios.

Hytera is also alleging contributory infringement and says: "Motorola has been and still is indirectly infringing [the] patent by actively inducing direct infringement by other persons who use products that embody one or more of the claims of the patent while Motorola had knowledge of the patent, knew, or should have known, that its actions would induce direct infringement by others, and intended that its actions would induce such direct infringement."

Hytera says it is seeking damages and will pursue further relief "as appropriate".

The company adds that it currently holds 480 issued patents, including 269 for DMR, TETRA and PDT digital products. Andrew Yuan, the company's president of North and South America, says: "Hytera is an adamant advocate of intellectual property rights. We will look to enforce our patents in court in the US and worldwide."

DragonWave in receivership

DragonWave has gone into receivership. In recent months, the Canada-based microwave backhaul specialist has de-listed from the Toronto Stock Exchange (TSX) and NASDAQ, and seen a number of its board directors resign.

Following an application from Comerica Bank as agent for DragonWave's senior lenders, the Ontario Superior Court of Justice has appointed KSV Kofman as receiver and manager over all of the company's

property, assets and undertakings. In mid-August, the court approved an expedited sale process for DragonWave's business and assets. It set an offer deadline of 15 September 2017 and a target transaction closing date of 29 September.

In a statement issued online, the company's CFO Patrick Houston said: "The receiver has advised that numerous parties have already shown interest on an unsolicited basis since its appointment and these parties have all been included in the prospective purchaser list."

He added that the company continues to operate "business as usual" during the sales process, and that all current orders and new orders will be delivered as usual.

According to reports earlier this year, DragonWave had been struggling to repay debts of CAD17.2m, and had been trying to pursue alternative financing. On 28 July, the TSX suspended trading of the company's shares and KSV Kofman was appointed as receiver on 31 July. The following day, the board of Peter Allen, Claude Haw, Cesar Cesaratto and Lori O'Neill resigned their board director positions with immediate effect. In the US, DragonWave was de-listed from Nasdaq on 2 August.

According to James Bagnall of the Ottawa Citizen, two "seismic events" stripped DragonWave of 60 per cent of its annual revenues in just two years. He claimed one of these was a "technical glitch" that led to the vendor stopping shipments to a customer in India. The other was Nokia's acquisition of Alcatel-Lucent, which was a major competitor, effectively killing more than half of DragonWave's sales.

Energy Vision orders hybrid power system for massive Burkina Faso rollout

Energy Vision has ordered more than one hundred units of Flexenclosure's *eSite x10* for a large rollout of cell site power systems in Burkina Faso.

Mauritius-headquartered Energy Vision is a telecom-focused ESCO (energy service company) focused on emerging markets, particularly Africa. It will use the *eSite x10* – which is claimed to be the world's first hybrid power system purpose-built for outdoor telecom sites – for an unnamed client that is described as a "major pan-African mobile operator." Burkina Faso's market is currently occupied by three cellcos: Orange; Telecel (Planor afrique; and Telmob (Onatel).

Flexenclosure has already begun manufacturing the systems at its facility in Sweden and Energy Vision plans to have them all fully up and running by the end of the year. The deal also includes training by Flexenclosure product specialists and an ongoing support contract.

Ofer Ahiraz, CEO, Energy Vision, says: "We aim to lead the telecom ESCO market in Africa, deploying the most innovative and technologically

INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
28/7/17	Motorola Solutions	Airbus	Plant Holdings	NA	Plant Holdings includes Airbus' DS Communications business which provides command centre software for fielding emergency calls & citizen emergency notifications in North America.
9/8/17	Investor group	Globecomm Systems	Company acquisition	NA	An investor group led by HPS Investment Partners & funds managed by Tennenbaum Capital Partners have entered into a definitive agreement to acquire Globecomm from a New York-based private equity firm. Financial terms have not been disclosed. Due to be completed 3Q17.
21/9/17	Public offering	Telenor Group	90 million common shares in VEON	USD4.15 per ADS/ share	Telenor's offering of its 5.1% holding of VEON's total outstanding common shares is in the form of common shares and American Depositary Shares (ADSs). Sale results in net proceeds to Telenor of USD365m. The Norwegian telco still has approximately 256.7m VEON ADSs which is 14.6 per cent of VEON's total outstanding common shares.
21/9/17	Alphabet Inc.	HTC	Pixel division	USD1.1bn	Google's parent company has bought the HTC division that develops its *Pixel* smartphones. As part of the deal, Google gains 2,000 HTC employees & a non-exclusive license for the Taiwanese manufacturer's intellectual property; it does not include any manufacturing assets.
22/9/17	Procera Networks	Sandvine Corporation	Company acquisition	approx. USD562m	The two companies have combined to offer a wider portfolio of network intelligence solutions. Merged entity will operate under Sandvine name led by Lyndon Cantor as president & CEO.

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
27/7/17	Intelsat	US	2Q17	USD	533.2	417.9	(0.20)	Total net loss of USD23.8m for the quarter. Total on-network revenues reported decline of USD7.9m to USD485.9m as compared to 1Q16.
27/7/17	Nokia	Finland	2Q17	EUR	5,629 (bn)	1,196	0.08	Overall reported net sales for period compared to EUR5,577bn in 2Q16. Net sales for MEA reported as EUR435m compared to EUR402m for 2Q16.
4/8/17	MTN Group	South Africa	1H17	ZAR	64,386	24,399	2.50	Group revenue in constant currency grew by 6.7%, underpinned by 10.8% growth in revenue in Nigeria & 5.2% (on an organic basis) improvement in service revenue growth in South Africa. Uganda, Ghana & Côte d'Ivoire also contributed positively to top-line growth. Cameroon experienced challenging period, negatively impacted by the data network shutdown in some parts of the country in 1Q.
11/8/17	Singtel	Singapore	1Q18	SGD	4,232	1,269	NA	Operating revenue up 8%, but underlying net profit down 4%. Singtel also holds around 36% of Airtel, making it the largest shareholder in the Indian company. Airtel's pre-tax profit contribution dropped 42% despite what was said to be "strong" cost management & lower depreciation in Africa.
16/8/17	Cisco	US	FY17	USD	48.0 (bn)	NA	1.90	YoY decrease of 2%. EMEA business totalled USD12,004m, a YoY decline of 2%.
23/8/16	IHS Netherlands Holdco	Netherlands	1H17	USD	199,129	126,894	NA	YoY revenue increase of 2.5%. The towerco group predominantly serves Nigeria's four main MNOs. As of 30 June 2017, it owned 5,927 towers, with a PoP lease-up-rate (LUR) of 1.64x, based on 9,692 PoP tenants & a combined LUR (including technology tenants) of 2.07x based on 12,273 tenants.
24/8/17	ZTE	China	1H17	RMB	54.01 (bn)	NA	0.55	First-half revenue increased 13.1%, powered by growth in mobile network & smartphone businesses. Carrier Networks division accounts for 59.9% of revenue.

advanced infrastructure in order to offer our customers the highest possible network uptime and SLA at the lowest possible TCO."

This latest deal for Flexenclosure follows a 2016 *eSite* order from Energy Vision for a hybrid power system rollout in Gabon.

Digitata Networks acquires IPR to NetTrax and TecTonix

Digitata Networks has acquired certain assets from South African network specialist RanWorx Solutions. They include the intellectual property rights in and to *NetTrax* (which has now been rebranded *NetCE*) and *TecTonix* (now rebranded to *NetPA*).

According to Digitata, the new additions mean it can now offer MNOs both a network- as well as a subscriber-centric view of their network performance.

The firm claims that combining its network-centric solutions (*NetCM* and *NetVU*) with the newly-acquired customer-centric solution (*NetCE*) will enable operators to have a clear line of sight to their subscribers and their actual experience on the network. It reckons the ability to measure subscribers' experience and correlate it with the relevant network node's configuration and performance will "greatly assist" MNOs in their daily operations.

Furthermore, Digitata says adding the newly-acquired *NetPA* passive asset tracking solution to its active asset management platform (*NetAM*) will allow operators to discover and track all network assets, both active and passive, throughout their network.

Silvertree to invest more millions in African tech firms

Silvertree Internet Holdings says it has now channelled more than USD15m (around ZAR200m) into African consumer-focused technology firms since it was established in 2014.

The Cape Town-based firm, which claims to be the continent's leading internet platform, says its portfolio has achieved an average annual revenue growth rate of more than 200 per cent, helped by fast-growing companies such as car-buying site Carzar and meal-kit delivery company Ucook.

Silvertree now plans to invest more than USD10m (ZAR130m) in the next 12 months into new and existing portfolio companies that make use of technology to reach consumers, with a focus on growth stage and buy-out opportunities.

It believes the biggest opportunities for tech investment in Africa are in businesses driven by strong teams that are executing simple, proven models. Furthermore, it claims that a focus on all three long-term value creation drivers – net revenue growth, margins and cash – allows the group's operations to reach break-even much earlier in their lifecycle.

"We want to partner with like-minded entrepreneurs looking to disrupt large and high margin industries in Africa," says Silvertree founder and MD Peter Allerstorfer. "It is still day one of the internet in Africa."

To help build on its success, the company has appointed Freddy Caspers as non-executive chairman of the board. Caspers was previously an executive board member and CEO of emerging markets for UK-based multinational Reckitt Benckiser.

Huawei launches partner programme

Huawei has launched a new global partner programme backed by an investment of USD250m.

The Solution Partner Programme includes independent software and hardware vendors, systems integrators, and consulting partners. Huawei says it will provide them with the technical, marketing and sales resources they need to design, build and market solutions based on its technologies. The investment includes USD70m for co-marketing projects.

The new programme, which is due to go live in October, will bring together all solution partners previously working with the vendor in separate programmes run by its Enterprise Business Group, Carrier Business Group, and Products and Solutions unit.

Huawei claims its solution partner programmes have already attracted more than 1,000 partners. It says that the number of OpenLabs, where partners can collaborate and test new solutions, has grown from five to 16, and that there will be a total of 24 by 2020.

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
19/6/17	John Colvin	Mimosa Networks	SVP of global field operations	Calix	SVP of sales for the Americas
3/7/17	Andreas Pauly	Rohde & Schwarz	EVP, test & measurement division	Rohde & Schwarz	VP, signal generators, audio analysers & power meters
15/7/17	Trond Westlie	VEON	Group CFO	A.P. Moller-Maersk	CFO. Replaces Andrew Davies who is stepping down
3/7/17	Roland Steffen	Rohde & Schwarz	–	Rohde & Schwarz	EVP, test & measurement division – retiring at year end
27/7/17	Matthias Kassner	EnOcean	VP product marketing	EnOcean	Product marketing director
8/8/17	Michael J. Van Rassen	Rajant	EVP of business development	US Army	Programme manager
8/8/17	Ed Preston	Rajant	Programme manager	Northrop Grumman Information Systems	Chief engineer
1/8/17	Nihmal Marrie	Cell C	Chief digital officer	Liberty Group	Divisional director: digital & customer value proposition
22/8/17	Kevin Isaac	Forcepoint	VP of sales, EMEA	Symantec	VP of EMEA enterprise sales
28/8/17	Nischal Gupta	Sterlite Tech	Chief transformation officer	Flipkart	Head of corporate strategy execution
28/8/17	Manish Sinha	Sterlite Tech	CMO	QuikrHomes & Commonfloor.com	EVP & business head
28/8/17	Sanjeev Bedekar	Sterlite Tech	Chief delivery & technology officer, telecom services	Telesonic Networks	CEO
29/8/17	Yacine Barro	Microsoft	Country manager for West & Central Africa	Africa24	Executive director
1/9/17	Mohamed Shameel Aziz Joosub	Safaricom	Non-executive director	–	Joosub continues in his current role as CEO & executive director of Vodacom Group as well as chairman of the Vodacom Group executive committee & Vodacom (Pty) Ltd.
1/9/17	Linda Watiri Muriuki	Safaricom	Non-executive director	–	Retains current position as a senior partner with LJA Associates
4/9/17	Fabien Garcia	Cambium Networks	Regional sales director for France & Morocco	Ruckus Wireless	Regional sales manager
5/9/17	Tonny Tugee	SEACOM	Regional head of Sales for Kenya, Uganda & Rwanda	Safaricom	Head of enterprise sales & retention
7/9/17	Willem Marais	Liquid Telecom	Chief business development officer	Liquid Telecom	CEO for South Africa

Sicap uses artificial intelligence to help cut mobile churn

Customer churn costs mobile operators 18 per cent of their revenue, according to Sicap. It has introduced *AI Engine* which, it says, identifies with 85 per cent accuracy those 24 per cent of subscribers most likely to leave.

When combined with *TargetMe*, its customer engagement automation solution, Sicap says *AI Engine* predicts and identifies churn-prone subscribers by combining customer-related data, statistical and analytical techniques, and self-learning neuronal networks.

Subscriber data are provided by the company's device and SIM management platforms, as well as internal and external data sources from operators. Before deployment, Sicap says the engine's neuronal network system is trained by using an operator's historic data and then continues to increase accuracy as it learns.

Sicap says *AI Engine* provides a churn prediction list which includes potential causes for a customer switching networks, subscriber segments, and a subscriber's likelihood to churn. The results are then used to automatically engage customers with targeted and personalised incentive offers, depending on the segment the subscriber belongs to.

The company says the results from the first proof of concepts are convincing. Using predictive and adaptive data models, it's claimed that subscribers most likely to churn were identified with 85 per cent precision.

MANUFACTURER: Sicap

PRODUCT: AI Engine

MORE INFORMATION: www.sicap.com

Quick install access point at "half the price"

Aerohive Networks says it takes less than two minutes to install its new *AP150W* combination access point and switch. And it claims that the product is half the price of competitors.

According to the company, the *AP150W* is the industry's first small form factor wall plate AP and switch combination with embedded IoT capability. It offers 802.11ac Wave 2 Wi-Fi, GbE switching, Bluetooth Low Energy (BLE) and ZigBee technologies.

The firm adds that the inclusion of its subscription-free lifetime cloud management, *Aerohive Connect*, makes provisioning of the access point simple. Guest and IoT secure network access is also said to be simplified with the device's PPSK capability. Furthermore, each *AP150W* features anti-counterfeit and platform-integrity measures that protect network secrets and prevent operation without valid access verification.

The AP is said to be ideal for use in hotels, retail areas, cruise ships and residential halls. Aerohive says it can power VoIP phones, IoT sensors and cameras through its integrated PoE switch and passive pass-through port. The company reckons this provides investment protection for existing cabling and switch infrastructure.

MANUFACTURER: Aerohive Networks

PRODUCT: AP150W

MORE INFORMATION: www.aerohive.com

VSAT terminal promises efficient use of bandwidth

Advantech Wireless reckons its latest flyaway VSAT terminal includes today's most advanced technology.

The *Engage Class* 2.4m transportable terminal is designed for ease of deployment and use. It is based on a ruggedised, tri-band-ready, 2.4m flyaway antenna, which can cover X-, Ku- or Ka-bands by replacing the feed only. The antenna is optionally motorised with an integrated satellite finding controller.

The terminal features two built-in independent triple access mode satellite modems based on the new ASAT II system, or SCPC mode military grade AMT-83L modems, and Direct Sequence Spread Spectrum (DSSS) technology. Advantech claims that the ASAT II system technology allows the same modem to operate three different access wave forms, and achieve the most efficient bandwidth utilisation possible.

The RF section includes second generation GaN-based technology SSPA/SSPBs. These support X-band from 20W to 100W, Ku-band from 16W to 125W, and Ka-band from 10W to 40W.

The entire terminal is said to be fully compliant with MIL-STD-188-164a, MIL-STD-810F, NATO STANAG 4484, IP65, and XTAR.

MANUFACTURER: Advantech Wireless

PRODUCT: Engage Class 2.4m flyaway VSAT terminal

MORE INFORMATION: www.advantechwireless.com

Mesh networking boost for Bluetooth technology

Bluetooth technology is forecast for growth in many-to-many industrial-grade uses now that the Bluetooth Special Interest Group (SIG) has announced its support for mesh networking.

The group, which has 32,600 worldwide members, says the new mesh capability is optimised for creating large-scale device networks, making it ideal for building automation, sensor networks and other IoT uses where tens, hundreds, or thousands of devices need to reliably and securely communicate with one another.

The SIG believes Bluetooth mesh networking will mirror the rapid growth in connected devices when Bluetooth Low Energy (LE) was introduced. It sees commercial building and factory automation as major market opportunities, giving examples such as wireless sensors, points of interest, and wayfinding services.

Bluetooth mesh networking operates on Bluetooth LE and is compatible with core specification version 4.0 and higher.

In building automation, the group says new control and automation systems – from lighting to heating and cooling to security – are about to make homes and offices smarter, supported by Bluetooth mesh networking.

It adds that Bluetooth LE is an attractive alternative for asset tracking over active RFID.

MANUFACTURER: Bluetooth SIG

PRODUCT: Bluetooth mesh networking

MORE INFORMATION: www.bluetooth.com/mesh

Boosting Wi-Fi speeds with new AC access points

D-Link says its latest dual-band wireless AC access points will enable users to upgrade their wireless networks cost-effectively. The company says they will be able to boost wireless speeds, tap in to the 5GHz wireless band where there is less interference, and create an easy-to-manage wireless network that can grow with the business.

MANUFACTURER: D-Link

PRODUCT: AC access points

MORE INFORMATION:
www.d-link.com

There are two new models to choose from: the *DWL-3610AP* selectable dual-band unified access point, and the *DWL-6610APE (pictured)* which also has external antennas. Both have dual-band support for 802.11n and 802.11ac and up to 867Mbps on the 5GHz band.

With centralised management, D-Link says up to 16 units can be grouped to form a self-configuring cluster. With the company's wireless controller, up to 1,024 APs can be centrally managed.

With multiple SSIDs, up to 16 virtual access points *(DWL-3610AP)* or 32 virtual access points *(DWL-6610APE)* can be created from a single AP. D-Link says that enables Wi-Fi resources to be separated for different purposes, such as internal/guest access, PoS equipment, electronic signage, etc.

The firm has also redesigned its A120 dual-band unified access point, the *DWL-6610AP*. Like the new *DWL-6610APE*, it is now less than 4cm in height so that both can be installed discreetly on a ceiling or wall.

Calix claims "more revenue and less hassle" for service providers'

Service providers can increase their revenue and cut service costs by offering their own Wi-Fi products, says Calix. The company reckons its products can now offer carrier-class Wi-Fi for subscribers at a fraction of the price being paid for consumer-class mesh products.

MANUFACTURER: Calix

PRODUCT:
Gigacenter & 804Mesh

MORE INFORMATION:
www.calix.com

Calix claims its mesh-enhanced carrier class Wi-Fi solution is the first to be designed specifically for communications service providers. It is delivering mesh-enabling software upgrades to its *GigaCenter* solutions and adding the new *804Mesh* satellite Wi-Fi repeaters which have been designed for self-install to ensure that subscribers get up and running at the lowest cost possible.

GigaCenters offer either 2.4GHz or 5GHz with concurrent dual-band networking, allowing continued usage of the 2.4GHz band for data and legacy consumer devices while supporting IPTV and high-speed data at 5 GHz.

Both products can be managed via Calix's cloud service.

According to the firm, more than 50 per cent of service provider customer care calls are about Wi-Fi. This means that even if the service provider is not managing the equipment, it is still paying the costs of supporting subscribers, and facing the risk of increased churn if the problems were not solved.

IDT offers operators a stronger voice

According to IDT, the international voice industry is in a "little bit of trouble". Revenues are decreasing, margins are "razor thin", traffic is migrating to OTT apps, and the move to IP technology has removed one of the barriers to entry into the international wholesale voice market.

MANUFACTURER: IDT

PRODUCT: Voicehub

MORE INFORMATION:
www.idt.net

As a result, IDT has come up with *VoiceHub*. This is specifically designed for any telecom operator with inbound or outbound international voice traffic that wishes to leverage IDT's resources and expertise to boost its operating and financial performance.

VoiceHub offers a portfolio of outsourcing solutions to address the specific circumstances of an operator based on region, volumes and routes. It features a range of different solutions which include a hybrid arrangement. This is where an operator wishes to retain certain routes or customers directly while optimising the rest of its business. Here, IDT would simply manage a subset of destinations, for example, regional or long tail.

Other solutions offered include managing the inbound traffic flow, minimising grey routes, and bypass eradication; and managing the inbound and outbound traffic.

IDT claims it has the global reach, minute volumes, network and the expertise to be able to achieve financial stability for a telco's international voice business.

ALSO LOOK OUT FOR

Network bonding tech promises seamless fail-safe connections

Livewire Digital has come up with a new product that it says could help the emergency services save lives.

According to the UK-based company, *Razorlink* will provide mobile phone users with ubiquitous and seamless coverage via satellite and terrestrial cellular networks. It says the technology is based on cross platform software that operates in the background, completely transparently to the user's application.

Razorlink has been designed for use over WANs such as international links, cellular, Wi-Fi and satellite. It features the ability to bond 3G, 4G, Wi-Fi, DSL and satellite connections to increase the available bandwidth and to offer a backup network for critical application.

Livewire gives the example of paramedics who need advice while on the move. It says if a cellular signal fails, *Razorlink* connects to a satellite service; if line of sight is lost during a satellite call, it can switch to an available mobile service. In both cases, the firm says that there would be no break in connection.

It adds that *Razorlink* can aid connectivity issues in Africa by making access to the internet and cloud services faster and more reliable.

Livewire has been awarded EUR900,000 by the European Space Agency to take the technology's development to the next stage. The firm says it will use the funding to accelerate the development of the SDN technology that it uses for network bonding. Development will include enhancements to the protocols, scaling for SaaS and cloud service offerings, and integration with backend infrastructure to facilitate deployment in telco networks.

RazorLink Smart Networking is available as software for *Windows*, *Mac* and *Linux OS*, or as a 'black box' device, similar to a router. Alternatively, *Razorlink* can be virtualised as private or cloud-based endpoints.

Caring for a continent

NetHope and its partners provided vital communications technologies during the 2013-2015 Ebola crisis in West Africa. Here, an aid worker measures a woman's temperature at a road block in Lakka, Sierra Leone. PHOTO: JULIA BROSKA

Wireless technologies play a unique role across Africa when it comes to providing innovative healthcare solutions.

Development in Africa has had a long history of Western influence which often doesn't address the continent's needs, according to Microsoft. It says that when it comes to health, community-developed programmes are far more successful. As a result, the company says it is seeing a boom in local health technologies tailored to fit the needs of the communities they're developed for. Many of these have been developed with Microsoft's help, and leverage the company's technologies.

For example, access.mobile was founded in 2011 and is a digital health company that aims to improve access to quality healthcare in emerging markets. With offices in Kenya, Uganda and the US, it is composed of an international team of healthcare professionals, software developers and social entrepreneurs. The company says it leverages mobile- and cloud-based technologies to strengthen the patient-provider relationship.

One of access.mobile's solutions is now being used in more than 100 health facilities in Uganda, Kenya, Tanzania and Nigeria, reaching an estimated two million patients. *amHealth* is described as "affordable, secure and easy-to-use" technology that simplifies practice management and improves patient engagement. The software and app-based system includes a number of features designed for both patients and clinical practices.

For instance, staff can send messages to groups of patients regarding health information, disease outbreaks, marketing and health campaigns and loyalty schemes. Patients can also be easily contacted via SMS or email with customised, targeted messages, or to cancel or reschedule their appointments as needed. *amHealth* also includes automated medication reminders which are said to improve a patient's satisfaction and health outcomes by helping to increase medical adherence.

In terms of the latter, there are other SMS-based m-health projects in Kenya, Mozambique and Uganda that remind patients to take their medication and keep their appointments. Qualcomm has taken this a step further with one of its *Wireless Reach* initiatives that was launched in Kenya in 2014.

Citing the CIA *World Factbook* at the time, Qualcomm said the HIV infection rate in Kenya was 6.3 per cent which meant around 2.6 million people in the country were living with HIV/AIDS. Offering free anti-retroviral therapy (ART) via clinics nationwide is a key element of the government's strategy to reduce HIV/AIDS-related morbidity and mortality.

However, ART requires continued treatment with anti-retroviral medicines ARV drugs, close monitoring of patient status and adherence, and an uninterrupted supply of critical pharmaceuticals. Prior to Qualcomm's project, healthcare workers at ART clinics manually tracked their ARV drugs, hand-wrote the reports that the Kenya Medical Supplies Agency (KMSA) requires in order to re-stock a clinic with the medication, and physically drove to the agency to submit the reports. Reports were often delayed, and many were incomplete, inaccurate or altogether missing.

The *Wireless Reach* project aimed to reduce the administrative burden on the healthcare workers, strengthen the pharmaceutical management systems for ART, and increase the efficiency and effectiveness of the delivery of ARVs to patients. This was achieved by equipping ART clinics in and around Nairobi with computer equipment, 3G data connectivity (which was based on Qualcomm's *CDMA2000 Rev* system at the time), and a new software tool. The latter was developed to track ART patient pharmaceutical information and help manage drug dispensations, and to automatically generate reports at each health centre. Qualcomm also trained and supported healthcare workers to use the new system.

The company said that the tool enabled healthcare workers to spend more time focusing on patient care. It's claimed that the timely submission of reports increased by 50 per cent, the average time to compile three monthly ART reports fell from 11.6 hours to 29 minutes, and that the average time spent on delivering the reports to the KMSA was reduced from eight hours to five minutes.

The project implementation was managed by Kenya's Provincial Medical Office (PMO) along with US-based non-profit research institute RTI International from its offices in Nairobi. The platform made use of open source software designed by RTI, which is derived from the manual recording system for managing anti-retroviral throughout Kenya.

In addition, the Communications Authority of Kenya (formerly the CCK) supported the acquisition and installation of computer hardware and software, amongst other accessories, in five health facilities in accordance with RTI's specifications. Dell also provided its *Vostro* desktop PCs and peripherals as a donation in support of the project.

The long-term goal is to produce a software and communication system that is locally sustainable and scalable to other health centres in Nairobi and other provinces. The upgrade will also facilitate online reporting to the KMSA and improve coordination between the health care centres, districts and the PMO. Ultimately, the same system could be extended to manage all pharmaceuticals in Kenya.

The Touch Foundation has launched a maternal health initiative in Tanzania that leverages mobile technologies from Vodafone/Vodacom. This includes the launch of a 999-style emergency line and an 'ambulance taxi' service to take women to hospital.

Vodafone Foundation supports 'ambulance taxis'

A first-of-its-kind 'ambulance taxi' service launched by the Touch Foundation and its partners has reduced maternal mortality rates in its first year of operation in two Tanzanian districts.

The foundation works to improve the quantity and quality of healthcare workers, and enhance healthcare delivery in Tanzania which is said to have one of the world's highest maternal mortality rates. In July 2015, Touch and its partners – the Vodafone Foundation, USAID and Pathfinder International – launched the *Emergency Transportation System (EmTS)* in Sengerema and Shinyanga, two rural districts in the Lake Zone that are served by poor roads and just two hospitals.

EmTS is part of a wider maternal health programme that addresses what are said to be the three delays that lead to adverse outcomes for women and newborns facing obstetric and post-natal emergencies: the delay in seeking care; the delay in reaching care; and the delay in receiving quality care. Touch says the partnership with the Vodafone Foundation allowed the programme to leverage investments made by Vodacom Tanzania to broaden mobile coverage and services in remote areas, ensuring that all segments of the population, regardless of location, are able to access the emergency system.

Vodacom Tanzania has also provided a dedicated toll-free number for people to request emergency transportation and access quality care. The emergency line includes a network of more than 100 taxi drivers who respond to emergency calls and take pregnant women on to the nearest hospital.

Sengerema and Shinyanga have a combined area the size of Belgium. That means a journey to a hospital can take three hours or more. But according to Vodafone, the distribution of the taxis ensures that they can reach the women up to 45 minutes quicker than one of the only 10 ambulances that serve a population of two million people in the two districts.

Once the women arrive at hospital, the emergency taxi drivers are paid using *M-Pesa* and at no cost to the passengers. Touch says the integration of Vodacom's mobile payment system into the

dispatch application ensures automated, real-time payment to the drivers. It adds that this not only reduces the operational and administrative costs related to the management of financial flows, but also increases the interest of rural taxi drivers in participating in the programme.

In its *Mobilizing Maternal Health* report published in May 2017, Touch says that the *EmTS* service had transported 2,887 high-risk pregnant women in the two districts since being launched. That is equivalent to three times the number of emergencies transported prior to the service's inception.

The research analysed one full year of operations in the Sengerema district, during which 1,430 pregnant women experiencing an emergency were transported, reducing maternal mortality by 27 per cent and saving the lives of 57 women. Of those women transported and treated, 23 per cent came from communities where no transport system was available beforehand.

As part of the wider programme, a network of 250 community healthcare workers in Sengerema and Shinyanga have been taught Tanzania's newborn and child health curriculum, and an additional 209 healthcare workers have been trained in life-saving emergency obstetric and newborn care. A mobile app has also been developed for the workers, helping them to manage more than 10,000 pregnant women and identify high risk cases.

Touch's report concluded that running its maternal health programme in the Sengerema/Buchosa district would cost the Tanzanian government approximately USD2,000 per maternal life saved, and that the *EmTS* service has the potential to be scaled nationally.

Netcare operates an extensive network of private and semi-private hospitals across South Africa, and aims to provide advanced healthcare services powered by innovative technology and training.

Selling medical dressings or buying a new dress?

Maisha Medical was founded in 2012 and aims to become the leader in the advanced wound care industry. It exclusively distributes *Drawtex* wound dressings into the South African state sector as well as to other selected African countries. Developed by South African manufacturer Beier Drawtex Healthcare, *Drawtex* is said to be the first hydroconductive wound dressing that features patented technology to aid effective wound bed preparation without damaging newly formed tissue.

To support its distribution operation, Maisha has a sales team of around 13 staff who are in the field for at least 90 per cent of their time, visiting government hospitals and clinics throughout the length and breadth of South Africa.

Each salesperson is given what the company describes as a "considerable" amount of petty cash per month to sustain their activities within their regions. This money is used for fuel, accommodation, hospital events, and general expenses.

Maisha wanted to ensure that its itinerant staff were visiting the correct hospitals, and using their expenses budget appropriately. Furthermore, the company's national sales manager Nick Tyolo says he needed to see where team members were at any given point, how long they spent with clients, and what orders could materialise as a result of each visit.

As with most public sector organisations all over the world, purchasing supplies is not easy. While clinicians may need specific dressings, all orders have to go through a government-approved procurement system. "But if we know a specific unit has an urgent need for, say, burn dressings, we can follow up with the procurement officers to expedite the order," says Tyolo. "I need to know this information and to check my team is really visiting the customers as required."

The solution to all these challenges came in the form of a GPS-based tracking system from Econz Wireless. Each salesperson now carries a tablet with the *Econz Timecard GPS* system on it – anyone who switches it off while on the job, is at the wrong hospital, or not out in the field at all, will be tracked to within 10 metres of where they should be.

Since introducing *Timecard*, Maisha office manager Johan Minnie says he can spot a fraudulent claim immediately. For instance, all the sales reps must start work either before or by 8am. This is due to doctors doing their rounds in the early mornings, and it is usually then that they know what supplies will be needed. Working in South Africa's state medical sector regularly includes visits to wound clinics where meals or snacks are provided afterwards. As a result, expense claims for food in the late afternoon are regarded as suspicious. Minnie says: "Now I can see exactly where the rep went after the hospital – if she went shopping, picked up an expensive takeout meal, what else was purchased, and where and how long was spent shopping.

"We can even pick up fraudulent claims for fuel – if the rep is driving a car (and we know them all) that has a 60 litre fuel tank, a claim for 120 litres at the same petrol station at the same time, means a second vehicle is involved."

Tyolo says the use of *Timecard GPS* and the ability to track staff has given the company real peace of mind. "We now know they have definitely visited the correct place at the required time, and sent us a sales report about product needs. We can see they are on the job, have taken the best route, and are there long enough from when they clock out."

Along with being able to track staff, *Timecard GPS* has given Maisha's managers accurate time and attendance records, saved on fuel costs, and increased sales productivity. Minnie says that even log books are now on time and automated.

Staying in South Africa, Netcare operates an extensive network of private and semi-private hospitals across the country. It has been making large investments in providing next-generation services as part of its mission to deliver quality care and professional excellence.

To help realise its vision for advanced healthcare services powered by innovative technology solutions, Netcare needed wireless infrastructure that could be owned and controlled centrally. This meant securely connecting two separate networks in each hospital – the LAN and the Wi-Fi.

Furthermore, the infrastructure needed to have high levels of security to protect extremely sensitive personal information. Without a budget for this particular technology project, Netcare had to look at ways of using its existing infrastructure and investments in order to meet business demands. This is where Johannesburg-based data centre, cloud, and internet services provider, Internet Solutions, came in.

By using some of the company's legacy infrastructure, Internet Solutions says it developed a firewall and Wi-Fi hotspot architecture that could deliver connectivity to all employees that were authorised to access the service. A Fortinet firewall was installed at each hospital location to securely link the two networks, so employees could log in from anywhere using a single sign-on, whether they were at their desks or on the move in the building. Internet Solutions proposed a fully managed service and provides complete support for all firewalls.

The company says that by being able to connect to applications from anywhere in the hospital, Netcare staff are able to deliver a more efficient service to their patients. In addition, visitors to the hospital now have access to public Wi-Fi services via Internet Solutions' sister company, *AlwaysOn*, all as part of the same solution.

Internet Solutions reckons that Netcare is now in the "perfect" position to continue investing in next-generation solutions that will improve the quality of care it can offer patients. The company claims its architecture enables the health services provider to take advantage of innovative cloud technologies without requiring additional fibre infrastructure.

Helping to defeat Ebola with comms and connectivity

NetHope is a non-profit US-based organisation that aims to make a difference through technological innovation. Its many members include other international NGOs, such as Grameen Foundation, the International Federation of Red Cross and Red Crescent Societies, Inveneo, Islamic Relief, Plan International, *et al*, while Cisco, Google, and the Bill and Melinda Gates Foundation are among those listed as technology partners and supporters.

At the end of 2013, West Africa began to be hit by what would become the largest Ebola outbreak that the world had so far seen. It reportedly had a 60 per cent fatality rate for those infected. Towards the end of 2015, the World Health Organisation declared that Sierra Leone, Guinea and Liberia – the three countries that had the most cases confirmed – were now Ebola-free, but by then the epidemic had claimed more than 11,310 lives, according to the Centers for Disease Control and Prevention.

NetHope says that fear of the virus was exacerbated by a severe lack of communications capacity when and where it was most needed during the outbreak. In collaboration with its partners, the organisation acted as a rapid first responder in affected countries, providing much-needed communications equipment and deploying connectivity solutions. All this proved to be crucial in unifying disparate sources of humanitarian care and ensured that those afflicted were efficiently cared for.

NetHope also provided 11 metric tons of mobile satellite terminals, VSATs, and satellite phones that enabled government and non-profit Ebola responders to communicate instantly with each other and the rest of the world. The organisation says this effort was directly responsible for the effective, coordinated delivery of healthcare services, food, water, shelter services, and the timely flow of the critical data needed to understand, and ultimately contain, the outbreak.

Additionally, in partnership with crisis informatics experts, NetHope provided critical visualisations of mobile networks, a map of Ebola treatment units, the trajectory of new outbreaks and their relationship to mobile coverage areas. It says this meant that those in need of care were able to receive it quickly and that providers were prepared to receive them, preventing further spread of the virus to other individuals. 100 digital volunteers were mobilised to provide informatics mappings to aid deliverers.

As a result of all its support, NetHope boosted the bandwidth of 44 locations and implemented brand new setups in 32 sites, rapidly responding where infection was most prevalent and spreading the fastest.

Communications tools acted as a lifeline for Ebola emergency responders, serving an estimated 22 million beneficiaries. More than 65 responding organisations were served with mobile, satellite and point-to-point connectivity solutions that supported an estimated 5,000 staff members. ■

Maisha Medical exclusively supplies Beier Drawtex Healthcare's patented hydroconductive wound dressings to state hospitals in South Africa. It is using GPS to track its sales reps across the country.

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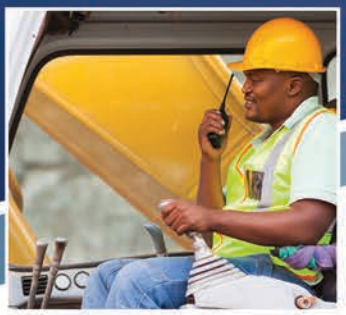


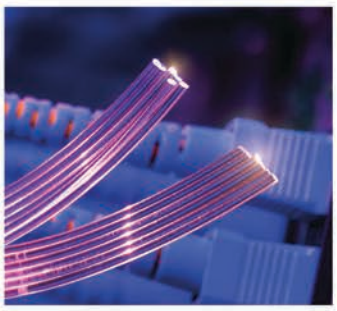

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LTE: not so fast in Africa?

LTE has now been deployed in almost every country on the continent – but there are still some notably large exceptions, as shown by the countries in grey.

While 4G seems to have rapidly spread across the continent, the region still lags when it comes to mobile broadband. RAHIEL NASIR looks at the progress made so far, and how operators can expand their coverage.

Globally, 107 million new LTE subscriptions were added during the first quarter of 2017, to reach a total of 7.6 billion. That's according to Ericsson's latest *Mobility Report* which was published in June. It says that in the Middle East and Africa, where mobile broadband penetration is currently lower than in other regions, the number of subscriptions is expected to increase significantly.

Ericsson includes HSPA, LTE, 5G, CDMA2000 EV-DO, TD-SCDMA and Mobile WiMAX as mobile broadband technologies (but not WCDMA without HSPA or GPRS/EDGE). It predicts that between 2016-2022, MEA will "dramatically shift" from a region with a majority of GSM/EDGE-only subscriptions to one where 80 per cent will be WCDMA/HSPA and LTE *(see mobile subscriptions by region and technology graph, on page 24).*

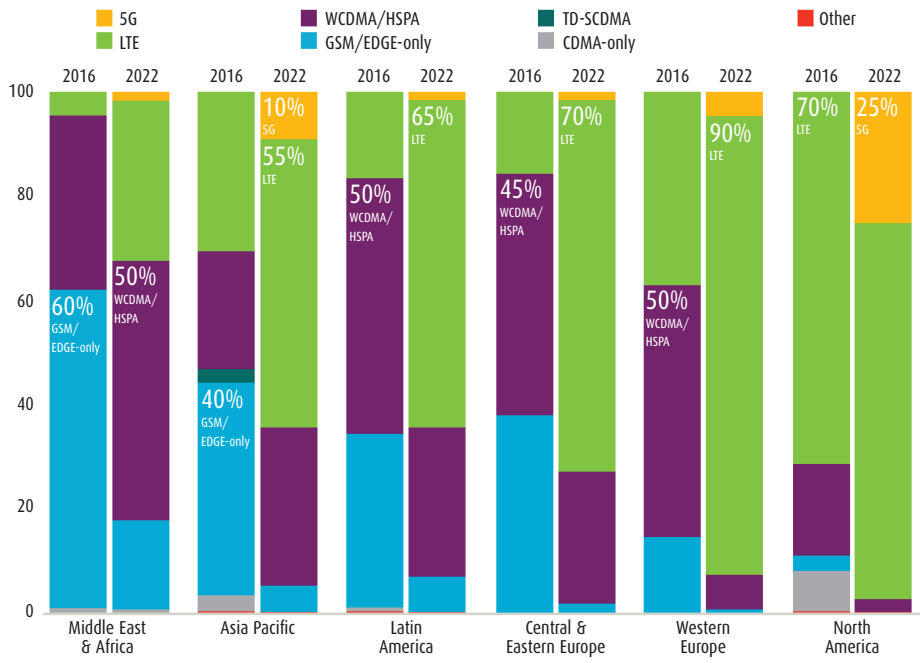
The *Mobility Report* states that there are currently 591 commercial LTE networks deployed in 189 countries. These include many African nations. In its July 2017 snapshot, the GSA (Global mobile Suppliers Association) says new operators that have so far commercially launched 4G on the continent include: BTC in Botswana; Econet Leo in Burundi, Free (Telco OI) in Réunion; Libyana in Libya; Orange Madagascar; Qcell in Gambia; Somnet Telecom, Somtel and Sahal Telecom, all in Somalia; Sudani in Sudan; and Telkom Kenya.

Several operators in Africa are now evolving their existing LTE networks to LTE-A (also known as 4.5G or 4G+), or implementing this from the outset as they 'leapfrog' technologies and upgrade from previous cellular generations.

For example in Sudan, Sudatel's mobile subsidiary Sudani went live with an LTE-A network in Khartoum earlier this year. It worked with Huawei on the deployment, and is using LTE-FDD and carrier aggregation (CA) over 1800MHz and 850MHz frequencies. The operator plans to expand the network to other major cities and towns over the coming months.

In June, Kenyan MNO Safaricom announced that it had gone live with 100 LTE-A 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 throughout the year. The operator said that the technology enables CA, and builds on its growing 4G network footprint which has been activated on more than 1,100 sites across the country.

Meanwhile in Zambia, Zamtel has launched a 4.5G network in the country's Copperbelt Province. Using LTE-2300 technology deployed by Huawei, the network has been rolled out



Mobile subscriptions by region and technology.

SOURCE: ERICSSON MOBILITY REPORT, JUNE 2017

in Kitwe, Kalulushi, Chambishi, Chingola, Chililabombwe, Mufulira and Solwezi.

Longer term evolution

Ericsson says many LTE-A implementations globally are combining lower and higher frequency bands (both for FDD and TDD modes) which will lead to a wider coverage area, increased network capacity, and faster data speeds.

Meanwhile, in its LTE in *900MHz market status* report published in July, the GSA says 900MHz (3GPP band 8) is used globally for GSM voice and basic data mobile communications. According to the association, technology-neutral licensing has enabled these frequencies to become a mainstream spectrum choice for mobile broadband using HSPA/HSPA+ (UMTS900).

"It has excellent propagation characteristics for wide area coverage (in rural areas) and in-building penetration (rural and urban)," says the GSA. "900MHz spectrum is typically limited in its availability for LTE due to its prior use for GSM networks; however, using 900MHz as an LTE band is gaining traction amongst operators, and the main infrastructure vendors all offer LTE900 solutions."

The GSA continues by saying operators around the world are known to have commercially launched LTE mobile broadband service in LTE900 either as a single band system or as part of a multi-band deployment, with many of the latter using LTE-A CA technology to deliver higher speeds for users. There are several African examples here.

For instance, earlier this year, Vodacom demonstrated speeds above 500Mbps on its LTE-A network using CA spectrum in the 900MHz, 1800MHz and 2100MHz bands at its regional office in Nelspruit, South Africa. In April 2016, ntel launched LTE-A in Lagos, Abuja and Port Harcourt using CA across 900MHz and 1800MHz spectrum. And as far back as 2013, the GSA says Unitel demonstrated LTE-A CA in Angola by combining 900MHz and 1800MHz spectrum on its live network. Two years later in early 2015, Unitel went on to work with Ericsson and claimed a first for Africa with the successful demonstration of an end-to-end LTE-A CA solution capable of supporting data speeds up to 450Mbps. The partners used 60MHz of spectrum, with three 20MHz LTE carriers in band 3 (1800MHz), band 7 (2600MHz) and band 1 (2100MHz).

Late with LTE

In a research brief published last year, the GSM Association's Intelligence division said that despite LTE now covering more than half of African countries, 4G adoption in the region still trails the rest of the world by some margin. Francesco Rizzato, the GSMA's senior analyst, telecoms forecast, predicted that the gap will widen by 2020. He said: "We expect all regions except Africa to exceed 75 per cent 4G coverage in terms of population by 2020, with average adoption (as a percentage of total connections) surpassing 42 per cent. In Africa, 4G coverage will reach 32 per cent by 2020, although adoption will still be below 10 per cent."

Rizzato said that one of the reasons for this significant difference was the prevailing use of high-frequency spectrum on the continent: "In Africa, two-thirds of the live 4G networks for which the spectrum allocated is known, operate on higher frequency 'capacity' spectrum bands (above 1GHz) only. These have limited propagation, so such networks are typically confined to densely populated urban areas. However, Africa's urban population is still low compared to other regions, making it difficult for mobile operators to increase coverage. Only 16 per cent of the networks use spectrum at frequencies below 1GHz, and 18 per cent use a combination of both."

According to the Global mobile Suppliers Association's *LTE in Africa* map on p23, there are around a dozen nations on the continent where there does not seem to be any 4G activity.

However, one such country which may soon benefit from better telecoms services is Guinea. After suffering dire financial problems since 2010 leading to its suspected bankruptcy in 2013, state-owned telco Sotelgui (Societe des Telecoms de Guinee) could be making a comeback. In August 2017, local reports cited telecoms minister Oye Guilavogui as saying that there was "no doubt" Sotelgui will start "very soon". The minister is also said to have revealed that the modernisation and expansion of the operator's infrastructure was still ongoing following a 2013 USD350m Chinese government loan for the construction of a 4,000km national fibre-optic backbone. Huawei has been awarded the USD238m rollout contract.

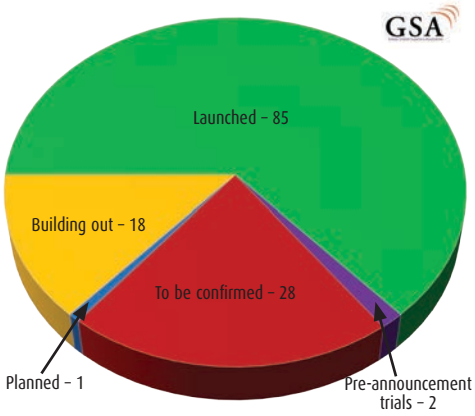
Meanwhile in Mali, Orange is reportedly hoping to introduce 4G technology in 2018. The telco is planning to renew part of its infrastructure in the country and is said to have pledged a XAF10bn (USD16.3m) investment for the operation this year.

Mozambique is another grey area on the GSA's map although reports earlier this year suggested that Vietnam's Viettel – which owns interests in Movitel, Mozambique's third-largest MNO – has expressed interest in installing 4G equipment.

There are also reports that Djibouti Telecom has been testing LTE since the beginning of 2016, but there have so far been no official announcements regarding its progress.

Building the networks

When it comes to increasing mobile broadband penetration, Ericsson says operators should begin by determining which sites to upgrade from 2G to 3G and/or 4G for the best ROI. It says one way to do this is by using CDRs associated with the existing 2G network as these will reveal which sites have the highest number of expected mobile broadband-capable users. By mapping how their spectrum assets match the capabilities of their



LTE activity in sub-Sahara Africa. From January-July 2017, the GSA says 11 new operators commercially launched 4G services. © GLOBAL MOBILE SUPPLIERS ASSOCIATION

Vodacom in South Africa and Mozambique, along with Malawian ISP Skyband, are among some of the African wireless operators using RADWIN's *5000 JET* point-to-multipoint radio system.

subscribers' device capabilities, MNOs will be able to identify sites with the most subscribers with 3G/4G-capable phones attached. Ericsson adds that upgrading existing 2G sites to 3G or 4G operating at low bands is possible on the existing network, and that there is potential to use larger antennas and beamforming to increase 4G coverage and capacity even further.

One vendor that is using beamforming is RADWIN. It believes the technology has already proved an industry game-changer; for example in South Africa, Vodacom launched its *Broadband Connect Wireless Premium* service using infrastructure based on RADWIN's *5000 JET*. It's claimed this has enabled the operator to offer speeds of up to 750Mbps while ensuring QoS of 1 to 250Mbps per user in a symmetric or asymmetric link. Other service providers using the *5000 JET* platform in Africa include Vodacom Mozambique, Internet Solutions Mozambique, Malawian ISP Skyband, amongst others.

RADWIN explains that when attached to its point-to-multipoint (PtMP) base station, a beamforming antenna provides a very narrow and steerable beam. This can be directed to the optimal reflection point in both line-of-sight and non line-of sight conditions to obtain the best possible link. The narrower beam reduces the level of mutual interference between adjacent sectors and sites, which means less spectrum is required thereby making network planning simpler, says RADWIN. Ultimately, the technology makes it possible to deliver increased gain, reach distances of up to 40km, and bring connectivity to multiple locations/users.

According to the firm, its *5000 JET* PtMP smart beamforming solution is the ideal choice for last-mile connectivity and for operation in heavily congested unlicensed and licensed bands where spectrum resources are scarce. The platform supports multiple bands in the same unit (3.3-3.8 GHz/3.65GHz or 4.9-5.8GHz), is designed to deliver up to 750Mbps per sector and 3Gbps per cell (four sectors using 2 x 80MHz), and offers dynamic channel bandwidth selection of 80/40/20MHz. It also features TDD radio synchronisation for greater network capacity as well as an integrated GPS receiver for syncing.

InfiNET Wireless is another infrastructure specialist that uses beamforming antennas with its radios. In May, it launched the *R5000-Qmxb*, a TDMA base station sector with an integrated beamforming antenna. The vendor claims the antenna enables "superior" interference immunity thanks to its additional gain and the dynamically steerable radiation pattern, both in downlink and uplink. As a result, InfiNET reckons the *R5000-Qmxb* delivers a "major" increase in link stability, and at least a two-fold improvement in network capacity.

The company says the device's net throughput of up to 240Mbps allows for dynamic frequency selection, automatic distance learning and channel time adjustment. It adds that high-level QoS supports 17 priority queues which facilitate various management features such as automatic software updates and online monitoring.

InfiNET also has high hopes for *InfiLINK XG* which it claims to be the fastest point-to-point system (PtP) currently available. Operating in the sub-7GHz frequency band, the firm says it can reach a peak of 500Mbps of net throughput in 40MHz of spectrum, and more than 130Mbps in just 10MHz.

Available with a range of 22 to 28dBi flat-panel dual-polarity integrated antennas, as well as a connectorised version for use with third-party external antennas, InfiNET boasts that the *InfiLINK XG* has "best-in-breed" spectral efficiency of up to 14bps/Hz, processing power of one million packets-per-second, connectivity at distances of up to 100km as well as "guaranteed" availability with a range of more than 60km using integrated antenna units. Other features include instant DFS technology to enable automatic frequency channel change with zero downtime, no link degradation even in harsh weather conditions, and a small footprint design that is easy to align and install.

In February, Intracom Telecom launched the *UltraLink-GX80*, its latest PtP platform. Described as a compact all-outdoor Ethernet radio, it operates in the entire E-band range of frequencies – 71-76 /81-86 GHz. The company says the new radio is ideally suited for 4G/4G+/5G RAN macro cell backhaul and C-RAN fronthaul applications, as well as transport applications in metro and aggregation networks as a fibre substitute.

Using FDD, Intracom says the *UltraLink-GX80* achieves throughputs of up to 10Gbps full duplex while offering a complete set of networking and packet frequency and phase sync features.

It adds that operating as an Ethernet bridge, the radio offers 1 x GbE plus 2 x 1/10GbE data interfaces, enabling deployment flexibility without the need for external switches. When operating in CPRI transport mode, three of the unit's interfaces can be used for CPRI transport up to Option 7.

The *UltraLink-GX80* is designed to be easily mounted on poles, while 'zero-touch' provisioning (via Bluetooth) is said to enable convenience, speed of installation and easier maintenance.

Left: InfiNET Wireless' *R5000-Qmxb* TDMA base station sector with integrated beamforming antenna. **Right:** the company claims its *InfiLINK XG* is the fastest point-to-point system currently available.

4G: the multibillion-dollar opportunity

Gartner forecasts that the worldwide market for end-to-end LTE network infrastructure will grow from USD20.9bn in 2016 to USD36.6bn in 2020, to account for 70 per cent of spending on mobile network infrastructure.

In August 2017, the advisory and research firm released its latest *Magic Quadrant for LTE Network Infrastructure* report. Ericsson is among some of the major vendors included here, and is described as one of the leaders in terms of numbers of LTE deals. "Ericsson's many long-standing relationships with CSPs are a solid advantage in terms of making it one of the 'go to' vendors for LTE upgrades," says Gartner.

The Swedish company's product portfolio focuses on the *Ericsson Radio System*, an end-to-end radio modular and scalable network that consists of hardware and software for radio, baseband, power, enclosure, antenna and site solutions. It also includes the firm's *MINI-LINK* range for microwave transmission as well as a fully integrated IP router portfolio, all managed by a common management system.

The company reckons its system includes the industry's most compact radios, which are 50 per cent smaller and lighter than previous generations, to enable more compact, higher density and cost-efficient site designs. It adds that TCO costs can be cut by 20 per cent through innovations such as a quick one-bolt installation process combined with the smaller size, weight, wind load and a high energy efficiency.

The platform is also claimed to include the industry's "most powerful" baseband, enabling operators to build distributed and centralised baseband configurations supporting high-capacity, multi-standard, multiband and multi-layer architectures. Ericsson says the baseband uniquely supports GSM, WCDMA, LTE and 'Massive IoT' simultaneously on one board, and also offers multi-standard operation, including carrier aggregation of combined LTE TDD and FDD.

Another major LTE infrastructure vendor that features in the *Magic Quadrant* is Huawei. As already stated on several occasions above, the company is highly prominent on the continent, and has been playing a major role in helping the region's service providers build out and upgrade their networks.

The Chinese vendor considers itself to be in the vanguard when it comes to network technology.

Late last year, it released a new solution which it claimed redefines spectrum refarming. As already noted by the GSA, an increasing number of operators are deploying UMTS900 networks by refarming 900MHz spectrum to supply coverage for basic mobile broadband networks. After refarming, the GSM networks are still used to serve GSM-only terminals, but according to Huawei, even when a UMTS small bandwidth (3.8MHz) solution is used, 6.2MHz of bandwidth is still required by the GSM and UMTS (GU) network. It says some operators are not able to upgrade their networks from GSM to GU because of insufficient 900MHz spectrum resources or heavy GSM network load – up to 15 per cent of global operators have only 5-6MHz of the bandwidth on the 900MHz frequency band, says the company.

To resolve these issues, Huawei has come up with what it describes as a "innovative" solution to improve spectral efficiency using GSM and UMTS overlapping technology.

While the industry standard is to use dedicated spectrum resources for different radio access technology (RAT), Huawei says it has deployed GSM and UMTS networks on the same frequency band. According to the firm, its *GU@5MHz* solution allows a GU network to be implemented using just 5MHz of bandwidth, thereby significantly reducing the wastage of scarce 900MHz spectrum that results from non-decommissioning or slow decommissioning of GSM-only terminals on existing networks. As a result, Huawei says *GU@5MHz* reduces the spectrum requirement for dual carriers on the UMTS networks, and doubles UMTS900 network capacity while reserving the GSM networks.

The company explains that its solution uses inter-RAT joint scheduling and super narrowband filter technology to efficiently eliminate inter-RAT interference caused by the overlapped spectrum, ensuring the stability of KPIs on the GSM network.

It says *GU@5MHz* also supports flexible spectrum allocation: "When GSM traffic requirements decrease, more spectrum resources are automatically allocated to UMTS. The solution can be deployed only by upgrading the radio access network side; there are no dependencies on other network equipment".

Rohde & Schwarz's *CMW500* wideband radio communication tester has been used on the verification of LTE FDD three component CA in the downlink, including 4x4 MIMO on each carrier.

Next-gen test kit needed for next-gen networks

While testing, measuring and monitoring any type of network is crucial for all service providers, the evolution of mobile networks need to address particular technical challenges presented by upgrading from 4G to 4.5G, LTE-A Pro, and beyond. These challenges are characterised by complex scenarios involving features such as carrier aggregation, MIMO, etc.

For instance, Germany-headquartered test and measurement specialist Rohde & Schwarz (R&S) says quadrature amplitude modulation (QAM) methods such as 256QAM and 64QAM in LTE and LTE-A increase data rates in both the downlink and uplink. Last year, the company worked with load testing solutions specialist Prisma Telecom Testing on the verification of LTE FDD three component carrier (3CC) aggregation in the downlink, including 4x4 MIMO on each carrier.

The solution consisted of three R&S wideband radio communication testers, the *CMW500*, an R&S *CMWC* controller, and Prisma's UeSIM multi-terminal simulator. The latter was equipped with two SDRv3 units and one eLSU unit for terminating the traffic. R&S says each *CMW500* generated a component carrier with 20MHz bandwidth and 4x4 MIMO, adding that the entire setup was able to provide a downlink data rate of 900Mbps.

R&S also demonstrated RF tests on the *CMW500* with 64QAM modulation in the uplink. These modulation methods increase the data rate in the uplink for LTE. The test setup is said to have reached a data throughput of 75Mbps on a single carrier or 150Mbps in combination with LTE-A uplink carrier aggregation. The *CMW500* also offers a number of other test functions, such as FDD/TDD joint operation, and LTE 4CC up to 8x2 MIMO.

R&S claims that the *CMW500* (in its *CMWflexx* configuration) and the Prisma UeSIM are the first test platforms to offer a combined downlink CA solution for up to three 4x4 MIMO carriers, protocol, RF and data performance verification up to 1Gbps. With the successful 3CC 4x4 MIMO verification, the partners said they had achieved an "important milestone" in the commercial evolution of LTE-A.

The *IxLoad LTE XAir2* has been designed to validate the performance and functionality of LTE-A Pro and 5G-related products and services. Developed by network testing, visibility and security specialist Ixia, the RAN test product is said to facilitate the realistic emulation of massive amounts of subscribers with multi-Gigabit OTT traffic via the internet, to help operators future-proof their networks and devices.

The platform features the company's *XAir2* load module to provide LTE user equipment emulation that enables an eNodeB Layer 1 to 7 test solution. Users can perform capacity tests, detail a cell throughput, measure voice and video quality, and model a wide variety of mobility scenarios. They can also test LTE on unlicensed spectrum.

TEOCO says its *SMART Capacity Management Solution* can help CSPs optimise current network capacity and plan ideal capex investments for traffic growth.

The analytics, assurance and optimisation specialist claims initial deployments of its solution with customers have demonstrated the potential of reducing upgrade spend by 10 per cent or more. The company says its data and algorithm driven platform does this by identifying the four most common areas of capex waste in terms of capacity: delays in re-purposing older infrastructure; failure to promptly re-farm spectrum; leaving 'default' settings across sites; and ineffective management of software licenses. SMART is said to uses network event data in combination with subscriber behaviour as a way to plug capex leakage in these four areas.

"As the demand on data grows exponentially and accelerated rollouts happen for LTE and VoLTE networks, capacity management will be more continuous in nature with the demand on 'what-ifs' and 'next best actions'," says Aloke Paskar, TEOCO's SVP of business transformation. "Capacity management is no longer just about learning lessons from the past, but also being able to predict the future by monitoring and managing the constantly changing customer behaviour patterns." ■

The *Ericsson Radio System* is a modular platform that comprises hardware and software for radio, baseband, power, enclosure, antenna and site solutions. It also includes the company's *MINI-LINK* portfolio for microwave transmission and a fully integrated IP Router portfolio, all managed by a common management system.

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Evolving network architecture for the web-scale era

The IoT and shift to cloud-based applications are redefining how underlying networks are designed, operated and developed, as FADY MASOUD explains.

The IoT is shaping our day-to-day lives – it is estimated that thirty billion devices[1] are expected to be connected to the internet in 2020.

Moreover, cloud-based applications are also changing today's enterprise landscape, from the products manufactured and the services offered to the way enterprise employees interact with each other, or with customers and partners. In fact, enterprise applications are doubling every 2.5 years, and global cloud traffic is expected to increase almost four-fold between 2015 and 2020[2].

As the cloud relies heavily on data centres, annual global data centre IP traffic (the data centre to data centre traffic known as 'east-west') is expected to reach 15.3ZB by 2020[2], up from 4.7ZB in 2015.

The fast-paced proliferation of internet-connected devices and the paradigm shift to cloud-based applications are fuelling major disruption and redefining how the underlying networks are architected, operated and evolved.

There was a time...

The evolution of optical transport networks from asynchronous and proprietary – for example, Asynchronous Transfer Mode (ATM), Token Ring, or fibre distributed data interface (FDDI) – to synchronous and standards-based (such as SONET/SDH) in the early 1990s has changed the telecoms landscape forever.

[1] www.mckinsey.com/industries/high-tech/our-insights/the-internet-of-things-sizing-up-the-opportunity

[2] siliconangle.com/blog/2016/11/11/global-cloud-traffic-to-increase-by-3-7-fold-by-2020-cisco-says/

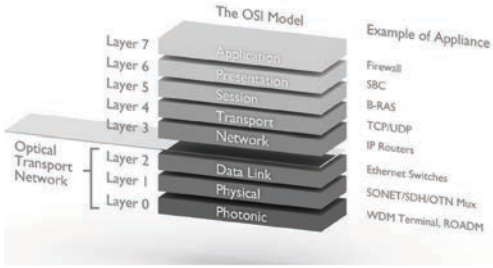

Figure 1: The Open Systems Interconnection model and examples of corresponding network appliances.

Pre-defined frame rates, containers and multiplexing hierarchy unlocked interoperability between different carriers' networks and allowed the extension of optical transport networks to reach all four corners of the world. Voice protocols comprised the majority of traffic carried across the network, with fixed bit rate (typically 64kbps) and pre-determined (or predictable) traffic patterns.

Simultaneously, Ethernet has evolved in data rates as well as in traffic engineering and management capabilities to provide a ubiquitous, simple and cost-effective way for data networking over ATM, Token Ring, FDDI, etc.

Accompanying this evolution, the seven-layer Open Systems Interconnection (OSI) networking model was introduced in the mid-1980s. This was the reference architecture to which the different types of optical terminals were designed and built *(see figure 1 above)*.

"Layer 0" has been added to reflect the advancements of WDM and its new wavelength-based routing and switching capabilities. Later on, the concept of "Layer 2.5" was added to reflect MPLS and VLAN technologies.

In the late 1990s and early 2000s, the optical networking industry witnessed numerous technology breakthroughs in hardware and software that led to the creation of a new breed of optical platforms. This generation offers networking capabilities in adjacent layers to further maximise return on investment and simplify network operations *(see figure 2 below)*. This was the birth of a still-evolving new type of optical equipment called packet-optical transport systems (P-OTS).

The rise of the ICPs

The proliferation of the internet and the paradigm shift in broadband access and optical networking have fuelled the creation of many online content providers. Most internet content providers' (ICPs') revenue streams are from online advertisements and monthly or yearly subscriptions for access to content such as movie or music streaming. Ensuring that end users have constant access to content is therefore crucial for every ICP's business model. As a result, they tend to spend heavily on their networks, particularly on data centres and cloud infrastructure. It is no surprise that the share of capex is increasingly coming from major ICPs.

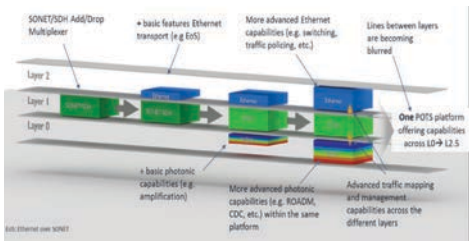

Figure 2: The arrival of packet-optical transport systems highlights how the lines are becoming blurred between the different layers in the OSI model.

The rise of the ICPs added a new type of player to the telecoms landscape. With hundreds of millions of end users (or even billions for some) spread all over the globe, an unheard-of demand for scalability and traffic growth, and significant revenue streams directly related to end users' QoE, ICPs have become a major driving force for new equipment that can offer unprecedented levels of network performance, automation and programmability.

With an ICP business model in which content is king and must be accessible anywhere, anytime and on any device with the highest level of quality, it became clear to the industry that the 1980s-era OSI model architecture underpinning the delivery of this content has reached a tipping point. It no longer supports the constant evolution in networks (e.g. NFV, SDN, etc.), nor the new service delivery model based on cloud applications, service virtualisation, etc.

OSI's heritage of function- and layer-specific network appliances, closed and proprietary protocols, rigid networking capabilities, and high operational costs sparked the urgent need to evolve toward a simpler, more efficient and agile architectural model to underpin the accelerated adoption of cloud-based networking.

Welcome to the New World

The new model consolidates and simplifies cloud service delivery and networking into two layers where all networking layers (Layer 3 and below) are represented by the transport layer, while all application layers (Layer 4 and above) are grouped under the cloud services layer.

The transport layer contains the transport functions from Layer 0 (photonic) to Layer 2.5 (packet switching), or even to Layer 3, offering 'packet-aware' transport capabilities. This layer sets the guidelines and principles for the transport of data streams, whether between end users and data centres or between data centres with bursty and often unpredictable traffic patterns.

The transport layer also defines the features and capabilities that increase network agility and performance and sets the cost points for new benchmarks in service delivery and cost-effectiveness, all key ingredients to the successful deployment of any cloud application.

Moreover, the transport layer is the cradle of numerous open concepts and projects (e.g. *Telecom Infrastructure Project* or *TIP*, etc.) aimed to ensure seamless interoperability between networking equipment vendors across the lower layers in the OSI model. The transport layer's support of open networking helps network operators smoothly transition and evolve their existing infrastructure to the cloud with ease and efficiency. It elevates network infrastructure from rigid and dedicated to shared and highly virtualised, thus allowing operators to maximise the utilisation of existing assets and defer premature capex-heavy network overbuilds.

The cloud services layer contains all applications, functions and services that run

Figure 3: Evolution from OSI to transport and cloud layer model.

in the cloud, including consumer and business applications, VNF, SDN-based service creation and orchestration tools, software frameworks and applications for big data and machine learning.

The rise of ICPs and their business model, where content must be delivered to hundreds of millions of users across the globe with the highest levels of quality, has driven the creation and development of numerous breakthroughs in defining protocols and building smart software tools. This enables large-scale task automation and programmability to streamline operations, eliminate the sources of human errors, and reduce operating costs. The massive demand for connectivity driven by the IoT and cloud-based consumer and business applications is evolving toward a model in which real-time network decisions are made autonomously (cognitive networking) over highly virtualised hardware and software resources.

The new model also defines an efficient communication and information sharing channel between the two layers through open and standards-based APIs such as RESTCONF, NETCONF/YANG and gRPC. These interfaces ensure an efficient and bi-directional information flow between the two layers to turn the network (transport layer) into a dynamic pool of resources for service requests triggered from the upper layer (cloud layer). This dynamic interworking model provides all the building blocks and mechanics to enable network-wide task automation, proactive network monitoring, dynamic bandwidth allocation and much more, as depicted in *figure 3* above.

Elevating the transport layer to web-scale

The transport layer plays a vital part in enabling cloud applications. By underpinning service requests created in the cloud services layer, which are often characterised by being spontaneous, dynamic in nature and requiring high capacity, the transport layer acts like a dynamic and instant pool of resources to provide scalable, secure and efficient connectivity as requested by upper-layer applications.

Network performance and its ability to meet the demand of the cloud services layer's applications are the cornerstone for any successful deployment of consumer or business cloud applications. Therefore, the transport layer must have the following attributes:

High capacity and seamless scalability: Technology breakthroughs in optical transport networking – such as super-channels, integrated photonics and advanced modulation schemes – unlock the ability to transport massive capacity over unprecedented distances to underpin the continuous demand for bandwidth and meet the stringent requirements of high-performance cloud applications. Transport networks must be scalable to meet future growth without network interruption or a massive infusion of capital.

- **High level of efficiency and cost-effectiveness:** While the network is key for the successful operations of all cloud providers, it represents a cost centre where opex can be lowered by choosing equipment that offers low power consumption, reduced footprint, and low cost per transported bit.
- **High level of task automation:** To deal with massive data streams and bursty, often unpredictable traffic patterns between end users and data centres or between data centres, cloud providers can leverage smart software tools to automate recurring tasks, enhance service management, and streamline operations. Emerging technologies like software-defined capacity (SDC) offer providers a network model with pay-as-you-deploy bandwidth, flexible bandwidth pools, and movable bandwidth across the infrastructure to instantly respond to forecasted and unforeseen events.

  They can also take advantage of new types of operational procedures centred around easy and rapid installation, provisioning (e.g. zero-touch), streaming telemetry, and proactive maintenance.
- **Support of open concepts/frameworks:** Many cloud providers value openness and seamless interoperability between networking equipment vendors across layers. In fact, numerous cloud providers are founding members of open concept projects and initiatives such as the *Open Compute Project* (*OCP*), *TIP* and many others. Hence, optical transport networks must support open networking concepts to help smoothly transition and evolve existing infrastructure to the cloud with ease and efficiency.

The cloud and IoT are redefining how networks are architected, operated and evolved. The fast-paced proliferation of internet-connected devices and the paradigm shift to cloud-based applications are driving an architectural evolution toward a new model based on a transport layer and a cloud services layer.

In order to better adapt to this new era of hyper-connectivity and web-scale, an intelligent transport layer leverages the latest technology breakthroughs to reach an unprecedented level of scalability, efficiency and automation. ■

Fady Masoud, Principal, products & field marketing, Infinera

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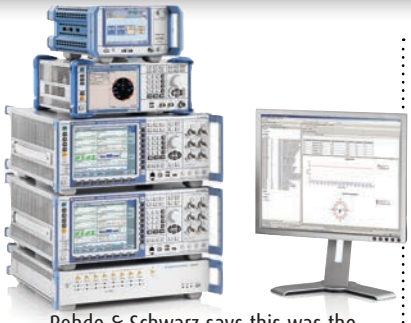


Rohde & Schwarz says this was the first time its *TS-LBS* setup was used to validate a device for A-BeiDou location based services.

Equipment verified for use with China's satellites

Location-based services have been verified for use in U-plane and C-plane with China's global navigation satellite system, A-BeiDou.

Rohde & Schwarz (R&S) carried out the verification of the MediaTek device under test using its *TS-LBS* equipment. This has been designed to allow mobile manufacturers, chipset makers, test houses and network operators to verify chipsets and devices in order to obtain permission to operate them in a particular network.

R&S says this was the first time that the setup was used to validate and verify a device for A-BeiDou location-based services. It comprises a *CMW500* as the base station simulator and a *SMBV100A* GNSS simulator. The *CMW500*, says R&S, provided assistance data to the device under test while the *SMBV100A* simulated the BeiDou satellites.

The BeiDou Navigation Satellite System (BDS) now comprises 23 satellites. It has provided services for China and its surrounding area since 2000 and services for most of Asia-Pacific by the end of 2012. It's claimed the system has brought significant economic and social benefit in transportation, fisheries, hydrologic monitoring, weather forecasting, geodetic surveillance, intelligent driving test, mobile phone navigation and vehicle navigation.

Its operator, the China National Space Administration (CNSA) says the plan is to expand services to offer global coverage by 2020.

Europe goes 5G with new connection in Berlin

Deutsche Telekom (DT) says it has become Europe's first operator to launch a 5G connection based on the latest 3GPP standard.

The connection has gone live on DT's commercial network in Berlin. Using 3.7GHz spectrum, it is said to offer a data rate of more than 2Gbps and latency of three milliseconds.

The operator worked with its long-standing partner Huawei on the deployment. It used the vendor's pre-standard 5G equipment and software which is said to closely track the 3GPP global standard for so-called 'Non-Standalone New Radio' (NR). Using this for enhanced eMBB (enhanced mobile broadband), Huawei says the connection is anchored in LTE while 5G NR carriers are used to boost data rates and reduce latency.

According to the company, 5G NR's characteristics make it "ideal" for the sub-6GHz mid-band needs for 5G applications that will require mobility support, wide-area coverage, as well as multi-gigabit throughput speeds and millisecond low latency. It says: "Therefore, 5G new radio will be deployed with the evolution of LTE as the baseline for wide-area broadband coverage. The specifications enabling that system will be complete by December 2017 as part of the first drop of 3GPP Release 15."

Deutsche Telekom CTO Bruno Jacobfeuerborn adds: "When the standard is defined, we will trial it in 2018 to prepare the ground for a wider deployment of commercial sites and the offering of devices for the mass market as they become available."

First MCPTT interoperability *Plugtests*

More than 1,000 tests were carried out during the mission critical push to talk (MCPTT) *Plugtests* event carried out earlier this year.

Hosted by ETSI (European Telecommunications Standards Institute) and the TCCA (TETRA and Critical Communications Association), the sessions were supported by the European Commission, and were the first in the world to test the interoperability of MCPTT products and services. They were observed by seven government and public safety network operator organisations from Belgium, Finland, France, Norway and the UK.

For this first session, a test specification was developed for the 3GPP Release 13 MCPTT, comprising 47 test cases. Equipment tested included: MCPTT application servers and clients; user devices; LTE network components including EPC, eNB and eMBMS, and IMS.

ETSI says the tests had a success rate of 85 per cent and that 19 vendors took part. Companies here included Airbus, Athonet, ETELM, Ericsson, Hytera, one2many, ZTE, amongst others.

The final tests of the *Plugtests* event included pre-arranged and chat mode group calls. This involved several MCPTT clients, a control room, an LTE cab radio and a TETRA radio.

As commercial products are developed, the TCCA will implement the vendor certification process for mission-critical products and applications, including MCPTT. The association says its key goal is to have one global standard for MCPTT.

According to the TCCA, although the PMR market shows no signs of slowing, mission-critical broadband LTE will offer complementary capabilities. Citing data from IHS Markit, it says the market is expected to grow at CAGR of 20 per cent, from USD1.1bn in 2015 to USD2.6bn in 2020.

Sailing in space: mission aims to clear junk

A 72-day test flight that investigated the possibility of cutting the amount of debris left in space by using a drag sail has been hailed as a success.

Backed by funding from the EU, the *InflateSail* is attached to a small CubeSat satellite. It features a 10m² sail that is connected to a one metre boom. The idea is to slow the satellite when in low Earth orbit so that it burns up on reaching the planet's atmosphere.

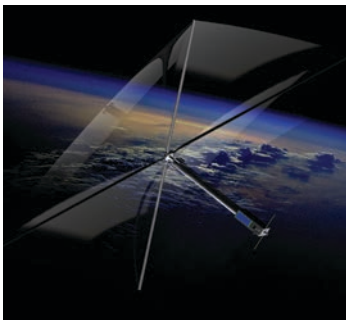
InflateSail was designed and built by the Surrey Space Centre (SCC), part of the UK's University of Surrey, for the Von Karman Institute, a non-profit scientific organisation based near Brussels.

SCC says the technology will prevent satellites from contributing to the 7,000 tonnes of space junk in orbit and avoid potentially disastrous collisions.

Dr Andrew Viquerat, lecturer in structural mechanics at the University of Surrey, adds: "Inflatable space structures allow very large, lightweight objects to be packaged in an extremely compact way during launch."

Early next year, SCC is set to launch another test mission, also with European funds, called *RemoveDEBRIS*. One of the systems it uses includes a net to grab junk and tow it behind a spacecraft until it burns up on re-entry. Researchers claim very large pieces will fall safely into the Pacific Ocean. During the test, the main spacecraft will release test junk, a 10cm metal cube.

The scientists says that a drag sail – pushed by photons of light from the sun – could in the future be attached to larger pieces of rubbish, forcing them back into the atmosphere.



A drag sail could be used to send tonnes of potentially dangerous space junk back in to the Earth's atmosphere so that it burns up.

TETRA secures Erbil International

Erbil International Airport (EIA) in Iraq is relying on a TETRA communications system from DAMM to support passenger safety.

Located in the city of Erbil in northern Iraq, EIA is one of two international airports in the Kurdistan region and is served by airlines from across the Middle East and Europe.

DAMM says its reliable voice and data communication system will be used for securing the safety of passengers at all times at EIA. The Denmark-based critical comms specialist says its solution was chosen as it includes the BS421 single-carrier outdoor TETRA base station which is "easy" to integrate, install and commission. DAMM adds that the "unique" IP65 encapsulated compact and rugged unit provides a fully redundant communication system, serving both EIA as well as airline customers.

The vendor installed the solution in collaboration with local partner, Sabaaco, a specialist in secure communications. Its deputy CEO Mustafa Al Mukhtar says: "The easiness of integration with the existing TETRA system saves both time and costs. With fast set up and installation time, the space saving compact outdoor base station provides low capex. In addition, opex is also saved as minimal air conditioning is required due to the power efficiency."

"Watershed" moment as first SACS link is installed

Angola Cables has moved a step closer to completing the South Atlantic Cable System (SACS) with the installation of the first direct subsea link between Africa and South America.

In what has been described as a "watershed" moment for African internet, the link was officially launched on 9 August in Sangano, Angola.

SACS was first announced more than two years ago. The 40Tbps system is being built by NEC and is now expected to begin operations during 1Q18. When it is completed, SACS will stretch more than 6,500km connecting the Angolan coast in the municipality of Quissama to Fortaleza in Brazil.

In a separate announcement made in early July, Angola Cables said construction had begun on its data centre in Fortaleza. It said the Tier III facility will play a crucial part in promoting Africa's digital inclusion and empowerment and providing high-speed internet at some of the lowest latency speeds between the two continents.

The link was officially launched in early August at an event attended by José Carvalho da Rocha, the Angolan Minister of Telecommunications and Technologies (sixth from right), business leaders and shareholders.

According to the company, it currently takes around 300 milliseconds to connect between Angola and Brazil. SACS is expected to reduce latency to approximately 60 milliseconds.

Two key routes will run from the Brazilian data centre: SACS will connect Fortaleza to Luanda and is expected to be completed by mid-2018; meanwhile Angola Cables' Monet system will connect Miami with both Fortaleza and São Paulo and is due to be completed by the end of 2017. The data centre also aims to accommodate more connections from the cable-dense region of Fortaleza. Clients who have already signed in Brazil include Prefeitura de Fortaleza, Claranet and AmLight.

Russia's first commercial Gigabit LTE network

Russian MNO MegaFon says it has showcased the capabilities of Gigabit LTE on a commercial network.

The operator says it achieved peak data download speeds of 979Mbps. Using FDD, it aggregated two 20MHz carrier at 2600MHz and one 20MHz at 1800MHz, and also used 256 QAM and 4x4 MIMO technologies.

The test was conducted using Sony's *Xperia XZ Premium* smartphone which features Qualcomm's *Snapdragon X16* LTE modem and is said to be Europe's first commercial mobile device to support Gigabit LTE. Nokia's *Flexi Multiradio* modules were used as the base station as these are installed in most sites across MegaFon's Moscow branch.

The Moscow branch is a subdivision of MegaFon and is currently home to more than 30,000 of the company's multi-standard base stations. It has more than 13.5 million subscribers in the region and claims that they benefit from Russia's fastest mobile internet speeds using an LTE-A network that supports speeds of up to 300Mbps. At last year's Ice Hockey World Championships, MegaFon says its mobile internet network reached 450Mbps.

The operator adds that the Moscow branch plans to be among the first in Russia that will commission 5G. Nokia's *AirScale* system module is already in place at its branch sites in order to support the path to the next-generation technology.

According to Qualcomm, Gigabit LTE is about more than peak speeds. The firm says: "It is also about delivering more network capacity, to benefit all users in the network, not only those users with Gigabit LTE devices. A Gigabit LTE device will complete downloads significantly faster."

Bike thieves beware – Sherlock is on your case

Cycle thieves are being hit by a new IoT device designed to be hidden in the handlebars.

And now the maker, a Turin-based company called Sherlock, has signed a three-year deal with Orange Business Services (OBS). The cellco's SIM cards will be embedded inside the firm's anti-theft device, a 120cm tube fitted with a GPS module for localisation, another module for GPRS internet connectivity, as well as low-energy Bluetooth for activation.

Once installed, it's claimed the device is "virtually impossible" for a thief to detect. If the bike is moved without permission, an alert is sent to the owner's smartphone who will be able to see its location at any time.

It also works as a unique identifier for the bicycle thanks to its 'bike passport'. This is a digital document that was designed in conjunction with the Turin City Police and is said to contain all the elements needed to prove ownership of the bike.

OBS says the worldwide connectivity it provides means that the device works straight away, roaming different networks for a suitable connection.

Sherlock adds that the device's battery life is two weeks and can be recharged using a micro USB cable.

The company's development was aided by two incubators: iP3, part of the Polytechnic University of Turin; and SETsquared which is run by four UK universities: Bath, Somerset, Southampton and Surrey.

The device features modules for GPS, GPRS and Bluetooth connectivity to send theft alerts to the user's smartphone.

Real world 5G tests

The RAPID 5G consortium has conducted 5G tests to examine the possibilities of running extremely high-speed data transfer rates of up to 10Gbps at very low latency to a large number of devices. The trial was led by Polish telco Exatel in a Warsaw shopping centre, which broadcast 4K and 8K video streams from 5G antennas to a computer fitted with VR goggles at speeds of 800Mbps. This tested the interoperability of the network infrastructure, focusing on the conversion of the video transmissions from back-end fibre networks to the 5G mobile spectrum in use.

China-UK HTS research

China and the UK will work together on research into high throughput satellite capacity and 5G mobile satellite systems. This follows the signing of a two-year research contract between China Academy of Space Technology and the UK's University of Surrey's Institute for Communications Systems. "The collaboration will include training and advanced radio and networking research," says ICS director Professor Rahim Tafazolli, adding that the lab will cement the relationship between China and the UK in the strategic area of satellite communication networks.

Gfast council launched

The US-based Broadband Forum has launched the Gfast Council to help facilitate the rapid deployment of the new gigabit broadband access technology. The council provide a centralised source of expertise and will inform the market through events, white papers, use cases and other resources. It will also promote a certification programme for interoperable products. According to the Broadband Forum, Gfast means faster deployments by extending fibre to existing wiring infrastructure.

Telkom 1 no longer in service following anomaly

On 25 August, state-owned Telkom Indonesia announced an "anomaly" on its Telkom 1 satellite. It said the glitch caused a shift in the direction of the satellite's antenna and consequently disrupted all transponder services.

As a precautionary measure, Telkom began recovering services by transferring a number of customers to Telkom 2, Telkom 3S and other third-party satellites. Working with Telkom 1's manufacturer, Lockheed Martin, the operator suggested that it had expected to complete this sooner rather than later. But by the afternoon of the following day, the recovery process was still ongoing.

Telkom then setup a 24/7 crisis centre staffed by more than 1,000 technicians from across the group. The company's president director, Alex J. Sinaga, said the whole operational team needed to focus on accelerating the customer migration process, both in terms of preparing the replacement transponders and repointing the ground segment antennas.

By 10 September, Telkom announced that it had successfully completed recovery for all of Telkom 1's 63 subscribers, eight of which are VSAT providers with 12,030 sites, bringing the total ground segment to 15,091 sites.

Telkom established a 24/7 crisis centre that was personally supervised by the company's directors, including president director Alex J. Sinaga (centre).

But in a press statement previously issued on its website at the end of August, the operator said that following an intensive investigation carried out with Lockheed Martin, Telkom 1 will no longer be in operation. It said: "Based on in-depth analysis, the satellite was not functioning as normal. Lockheed Martin recommended to shut down the operation to prevent interference with other satellites."

Some reports have suggested that Telkom 1 may actually be breaking up. ExoAnalytic Solutions is a US-based firm that runs a global network of 165 telescopes to provide real-time tracking and monitoring of objects in geostationary orbit. According to arstechnica.co.uk, one of ExoAnalytic's telescopes in Eastern Australia seemed to have captured images showing the satellite in fragments.

In mid-September, a Lockheed Martin spokesperson said: "At this time we cannot verify the accuracy of recent news reports speculating about potential debris. We are working diligently to understand the facts and support PT-Telkom's recovery efforts. We will provide updates as they are available."

The spokesperson added that engineers from the two companies are in contact with Telkom 1 and reviewing data about its operational status to understand the nature of the anomaly and determine next steps. "The satellite is functioning and responding to commands, although the anomaly has affected its operational status."

When it was launched to 108°E in August 1999, Telkom 1 was expected to have a 15-year life, but recent assessments showed that it was in good condition had enough power to carry on operating until at least 2019. However, Telkom had already been planning to replace the orbiter in mid-2018 with Telkom 4 which will feature 60 C-band transponders and offers greater capacity than Telkom 1 which carried 24 C-band and 12 extended C-band transponders.

KBR and Cambium connect *Tour of Britain*

Cambium Networks and Wi-Fi specialist KBR helped to keep thousands of people online during the recent *Tour of Britain* cycling event.

KBR used 16 of Cambium's *cnPilot e500s* outdoor access points for the nationwide event which ran from 3-9 September. As well as providing Wi-Fi coverage to spectators, staff and media at the finishing line of each of the tour's eight stages, the APs also enabled internet access for the event's hospitality suites, public viewing spots and the sponsors' exhibition. In addition, the network was used by staff to collect race statistics and information, as well as provide them with reliable communications and connectivity to the service vehicles.

KBR has provided Wi-Fi at the annual *Tour of Britain* for the last four years. Speaking just before the event began at the end of August, the company's technical director Gareth Tomlin described Cambium's solution as "incredibly easy to deploy". He said this was crucial when setting up eight different Wi-Fi networks in eight different cities over eight successive days.

He added that depending on the size of the run down to the finish line, KBR could put up as many or as few APs as required and mesh them together quickly and efficiently.

"This overcomes the complexities this situation presents, with potential challenges including the network's physical infrastructure, the number of people accessing the service simultaneously, and the Wi-Fi range," said Tomlin.

According to Cambium, the 802.11ac *e500s* provided KBR with faster meshing and high throughput, making the network easier to manage and configure. The company says its solution eliminated the need for a central Wi-Fi controller, and claims this meant there was no single point of failure and that the network was able to cope with the thousands of people potentially using the service at one time.

KBR used Cambium's outdoor APs to provide Wi-Fi coverage at the finishing line of each of the tour's eight stages.

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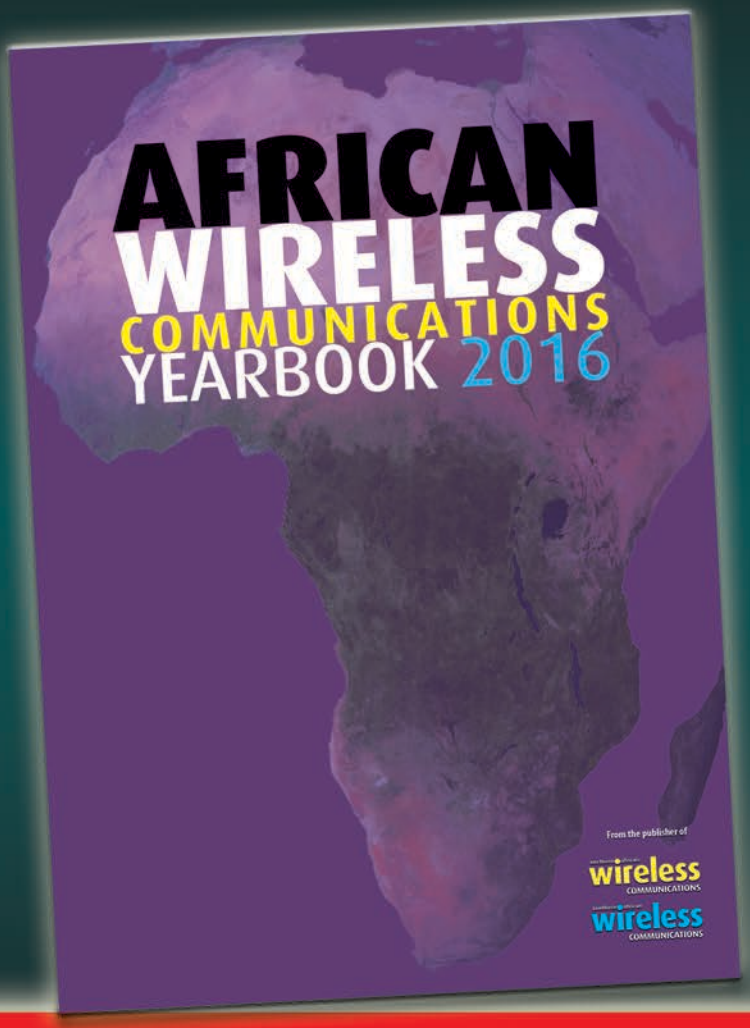

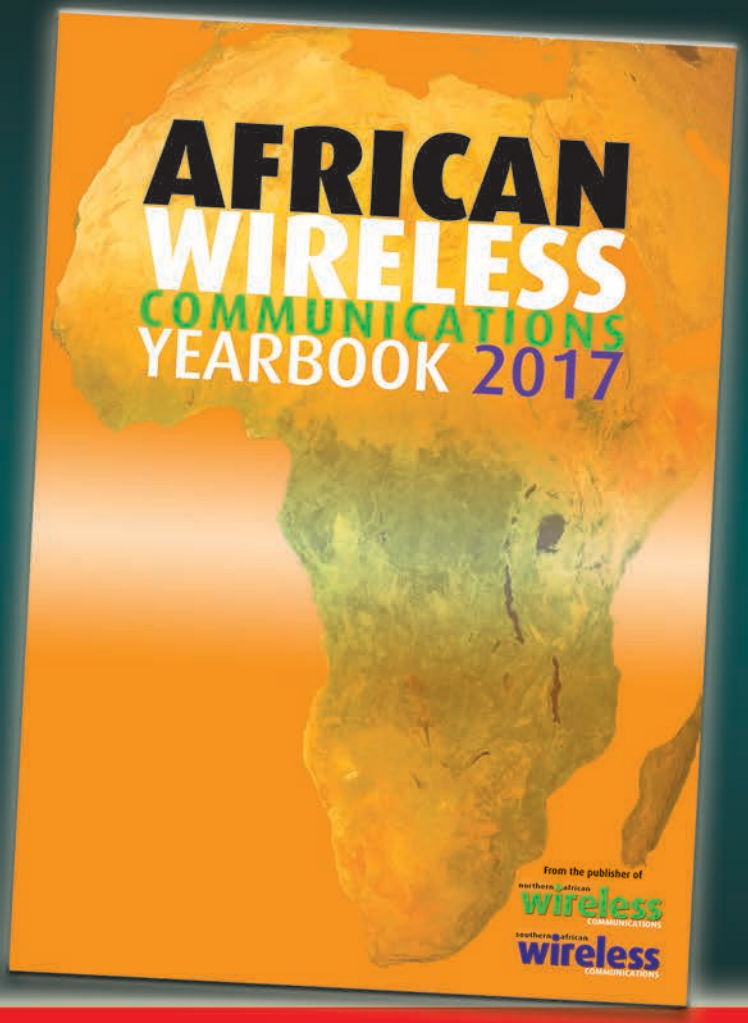

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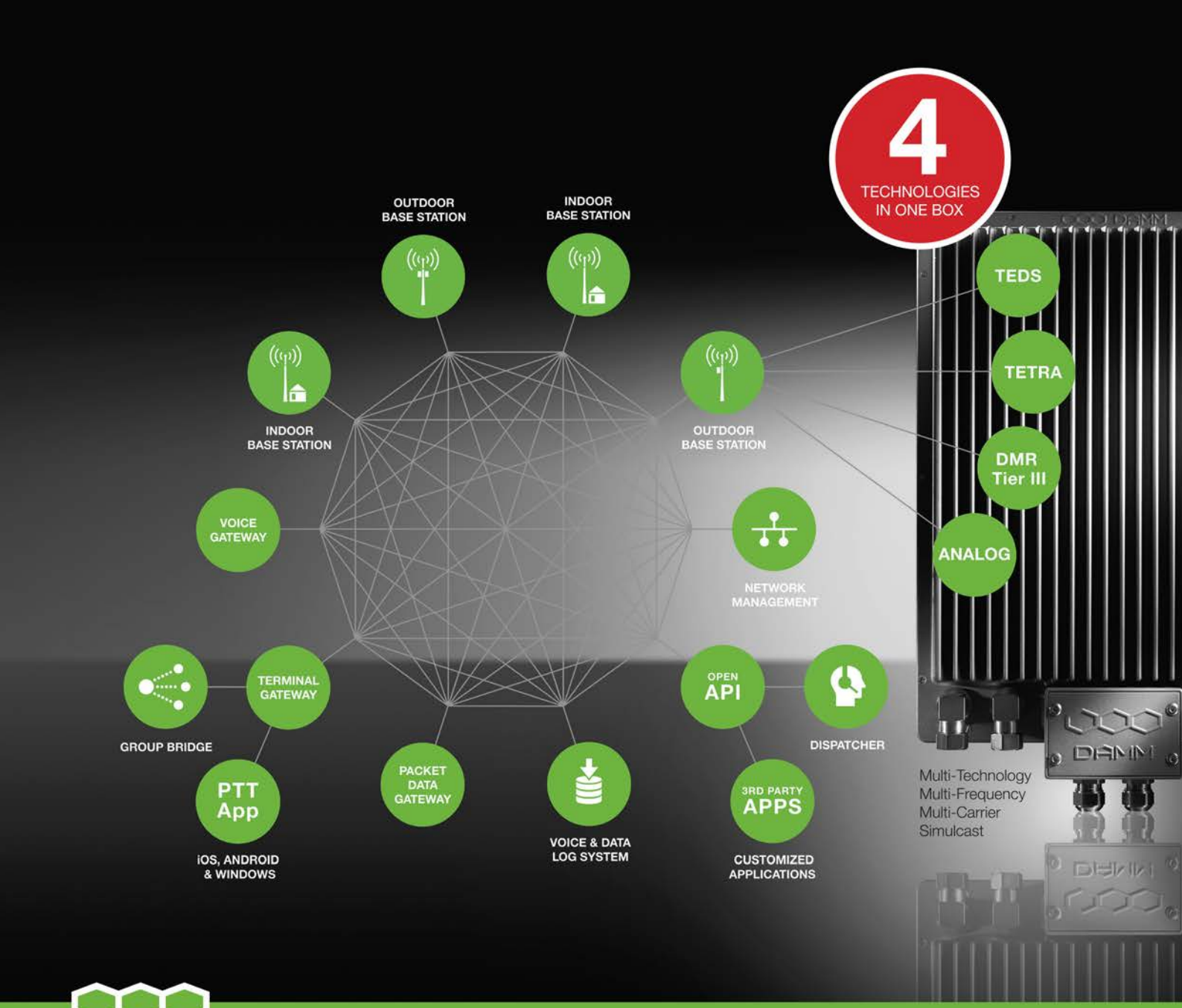

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