JUNE/JULY 2016
Volume 15
Number 3

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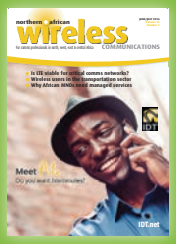

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Huawei to build eLTE broadband trunking at Algiers airport

Algeria will see the first commercial deployment of an eLTE system at an airport in Africa.

Following its successful bid, Huawei will be responsible for the broadband trunking project at the Houari Boumediene Airport in Algiers. Under the contract, the company will provide an eLTE core network, base stations, trunking terminals, multimedia dispatching, and other devices and systems.

Houari Boumediene currently uses TETRA for routine scheduling and dispatch. But its narrowband system is said to be insufficient for broadband data transmission, mobile video surveillance, or multimedia dispatch.

Furthermore, ground handling services are performed in a complicated and noisy environment, making voice dispatch error-prone and increasing security risks.

Huawei will provide a system that is capable of interworking with the existing TETRA platform to improve the accuracy and efficiency of ground dispatch. The vendor says its real-time, large-bandwidth eLTE platform will enable the airport to carry out multimedia trunking dispatch, video surveillance, and other applications on a single network that covers both indoor and outdoor working areas for the ground staff.

To cope with noise in the airport, Huawei says its system supports throat vibration mic earpieces, noise-cancelling headphones, and additional accessories to guarantee voice trunking performance.

The company adds that eLTE can offer complete video dispatch and real-time monitoring services through backhaul of onsite images to the command centre. It also provides an open eSDK for interconnection with third-party airport applications.

Houari Boumediene airport handles 10 million passengers each year, but the government is building a new terminal to increase its capacity to 14 million.

Gilat to help Dizengoff connect rural Ghana

Dizengoff Ghana has selected Gilat Satellite Networks (GSN) to implement a turnkey solution for the delivery of broadband and cellular services via satellite throughout rural Ghana.

GSN will deploy various platforms to meet the rural communications requirements of the Government's Ghana Investment Fund for Electronic Communications (GIFEC) initiative.

The company will supply its *SkyEdge II-c* hub which is capable of supporting multiple applications, and *Gemini* VSATs which will deliver broadband services to schools. GSN's *Capricorn* VSATs, in conjunction with its solar-powered *CellEdge* small cells, will also be implemented to extend cellular services for several leading mobile operators in Ghana.

"Gilat was the only company capable of providing us with a full turnkey solution for the delivery of broadband to schools, as well as cellular service expansion, all on a single platform," says Patrick Attia, general manager, communication at Dizengoff Ghana. "The demanding rollout calls for installation and operation by November of this year."

Dizengoff is a subsidiary of UK-based Balton CP which has worked in Ghana since its independence in 1957.

ABS launches second all-electric satellite

ABS has successfully launched *ABS-2A*. The satellite left Earth on board a *SpaceX Falcon 9* rocket from Cape Canaveral on 15 June.

ABS-2A is the second of a pair of satellites from ABS that use all-electric propulsion systems. Its launch comes a year after *ABS-3A* which was one of the first to use such as system *(see 'The new space race', Dec 2014-Jan 2015)*. Both were built using Boeing Satellite Systems International's *702SP* platform. According to the manufacturer, electric propulsion is more efficient and helps lower the mass of a satellite allowing for larger, high-power payload capabilities.

ABS-2A is equipped with an all Ku-band payload of 48 high-performance transponders connecting Africa, the Middle East, Russia, South Asia and South East Asia. It will be co-located with *ABS-2* and deliver enhanced broadcast and data services from 75°E.

This is the third satellite ABS has launched since 2014 and completes its USD700m capex programme. The company says: "*ABS-2*, *ABS-3A* and *ABS-2A* are extremely capable satellites which have been optimised for CATV and DTH services. [They are] unmatched by any other forms of technology for video distribution."

Intelsat prepares first high throughput satellite for Africa

Manufactured by Boeing, *Intelsat 33e* is said to be equipped with the "most advanced" digital payload on a commercial spacecraft.

Intelsat is preparing to launch the first satellite for Africa that uses its *EpicNG* high throughput system.

In July, *Intelsat 33e* arrived at Arianespace's launch site at Korou in French Guiana where it is undergoing final preparations before its scheduled lift-off on 24 August.

Built by Boeing and equipped with what's claimed to be the "most advanced" digital payload on a commercial spacecraft, *IS-33e* will extend Intelsat's high throughput capacity in both C- and Ku-band from the Americas to include Europe, Africa, the Middle East, Asia Pacific, the Mediterranean and Indian Ocean regions.

The company says *IS-33e* is the first multi spot beam, Ku-band high throughput satellite to serve these regions, and will be its second to use *EpicNG* following *IS-29e*'s launch earlier this year for coverage across the Americas and North Atlantic.

According to Intelsat, *EpicNG*' is designed for higher performance, better economics and simplified access. It claims that with increasing broadband requirements and a growing number of smartphone users, the flexible and open architecture of its platform will enable mobile and fixed line operators to cost-effectively extend their networks and meet the surges in demand for services.

Select customers have already committed to take advantage of *Intelsat 33e*. In Africa, they include Telkom South Africa, Orange, IP Planet, Vodacom, Dijoubti Telecom, Africell and MultiChoice.

Following a successful launch, *IS-33e* will be located at 60°E where it will undergo in-orbit testing prior to its expected in-service date at the end of 2016.

MTN wins 2.6GHz auction in Nigeria

Only one operator submitted a bid in the Nigerian Communications Commission's (NCC) auction for 2.6GHz spectrum that was announced earlier this year.

The regulator said MTN Nigeria expressed an interest in six lots out of the 14 on offer, and paid the bid deposit as specified by the auction's information memorandum. This stated that if the aggregate demand from approved bidders is less than, or equal to the number of lots on offer, the commission will provisionally award the license to the party/ parties at the reserve price.

As a result, MTN Nigeria's bid was approved, and in late May it was provisionally awarded a 10-year license for 2 x 70MHz in the 2.6GHz band at a cost of USD96m.

According to MTN, the spectrum will guarantee "superior performance" for wireless networks, especially LTE services. It plans to deliver mobile broadband and 4G across the country, starting in Lagos and Abuja.

The operator also plans to use FDD networks in addition to its existing WIMAX over TDD networks. It says this provides for "greater consistency" with existing 2G and 3G deployments.

MTN settles Nigerian fine dispute – Wireless Business, p13.

"Giant step forward" for cost-effective connectivity

AfricaOnline and Intelsat have teamed-up to deliver a managed broadband internet service for sub-Saharan Africa.

Under the agreement, Intelsat will provide satellite services via *Intelsat 28* located at 33°E, while AfricaOnline will provide ground support and network management services from its facilities at Hartebeesthoek in South Africa.

The two companies will work together to offer a "high-quality" Ku-band broadband service on a virtual network operator basis.

AfricaOnline is a wholly-owned subsidiary of communications solutions specialist Gondwana International Networks. Its CEO, Mathew Welthagen, says: "The upfront capital commitment and ongoing fixed operating cost structure of Ku-band VSAT has constrained expansion of services in Africa. A managed VNO platform allows for increased economies of scale, both in terms of capex and opex, and is a giant step forward in bringing cost-effective connectivity to Africa."

The partners believe their VNO model reduces minimum capacity obligations, and cuts both the initial outlay needed by the region's VSAT operators for infrastructure as well as their operational costs.

They add that this is beneficial to operators, distributors and end-users alike. The companies say it enables VSAT service providers to focus on marketing, provisioning, support and their customers, rather than network infrastructure.

The partners say that up until now the costs of building and running Ku-band VSAT infrastructure has hindered the growth of services in Africa.

Satcoms improves network and reduces costs for mining company

Resolute Mining is using an optimised managed satellite service to connect its production site in Mali back to its headquarters in Australia.

SpeedCast is responsible for the system. It says the improved network now offers faster voice and data comms between Resolute's gold mine in Syama and its HQ in Perth in Australia, as well as a higher throughput link for exchange of vital operational and corporate information.

It's claimed the new system has resulted in a 35 per cent reduction in Resolute's monthly operational costs, and almost zero capex investment. SpeedCast says it was able to "seamlessly" integrate the service into the company's existing infrastructure. As a result, Resolute was able to better utilise its existing investment without compromising on quality and efficient use of the satellite network, resulting in an increased ROI from its existing capital investment.

Furthermore, SpeedCast says it was able to provide in-country support with installation, on-site storage of spare equipment and user training, all available in French.

Resolute is one of the largest gold producers listed on the Australian Securities Exchange. Its flagship mine in Mali is 300km south-east of the capital Bamako and 30km from the Côte d'Ivoire border. The mine has an expected life until 2028 and also benefits from fully operational parallel sulphide and oxide processing plants.

In addition, Resolute controls an extensive exploration footprint along the highly prospective Syama Shear and greenstone belts in Mali and Côte d'Ivoire.

Safaricom gains network insights to enhance services

CEO Bob Collymore says Safaricom aims to differentiate itself with a customer-centric approach – investing in CEM is therefore vital.

Safaricom is using 'Big Data' technology to derive real-time insights into its voice, SMS and *M-PESA* traffic. It is processing 214 billion data points per day, and is also adding mobile data capabilities to the system.

The operator is using Nokia's *Customer Experience Management (CEM) on Demand* in an effort to differentiate its services in Kenya. This is integrated to other internal systems including financial, data warehouse, CRM, and *M-PESA*. It enables Safaricom to collect all of its customers' network experiences, and these insights are then used by its technology, customer care, finance, marketing, sales, and strategy teams.

Nokia says its solution was deployed within 12 months with a pilot up and running in the first six months in western Kenya.

The vendor claims the platform has enabled Safaricom to speed up a number of its processes. For instance, the time taken to retrieve subscriber records for customer care has been cut from between two to six hours to 15 minutes; customer satisfaction scores for the entire network can now be obtained in near real-time as opposed to 30 days; and the root causes for service degradation can now be determined in 10 minutes whereas before it took 24 hours.

"We now have one customer experience management solution for the company," says Safaricom CEO Bob Collymore. "We can resolve issues before they impact subscribers; we can give individual customers a personal touch and make our constant quality of service improvements visible."

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ON THE NETWORK

Mobile money boosts Kenyan entrepreneurs

In Kenya, mobile money has changed lives by making it quick and easy for people to pay each other. Now, it promises to also make it simpler and safer for entrepreneurs to do business, and potentially even open up new markets for them.

The single biggest benefit of mobile money is that it allows smaller companies – even informal micro-businesses without banking accounts – to take advantage of the benefits of digital payments.

According to statistics from the country's Communications Authority, Kenya racks up KES3bn in mobile transactions each day, and has Africa's highest level of mobile money penetration (58 per cent).

Yet, despite the impressive numbers, there is still plenty of room for mobile money to grow. According to a Nielsen study, 95 per cent of people in Kenya still pay with cash in retail outlets, 12 per cent make use of mobile money, and just two per cent use credit or debit cards.

Many small businesses still prefer cash because they are reluctant to pay card transaction fees. However, cash has a range of drawbacks for businesses: it is expensive to manage; exposes them to the danger of theft; and means that they need to keep a float to give customers change.

Payment solutions for merchants are maturing all the time, thanks to companies such as Kopo Kopo, which use mobile money as a platform for merchant services such as payment acceptance and cash advances.

SMBs, particularly those in the retail and transport sectors, could benefit significantly by driving more transactions through mobile money. Mobile and digital payments are easier to track in a financial system and what's more, someone who lives in another town or city can easily pay you without physically being there.

Millicom launches DCs in Chad and Senegal

Millicom has established two new data centres in Chad and Senegal and claims it is now leading Africa's business-to-business telecoms market.

The USD6m facility in Chad is the country's first data centre. Built in the capital N'Djamena, the prefabricated data centre was supplied by Flexenclosure as part of a turnkey project that included responsibility for the building itself as well as the site infrastructure around it. Initial construction of the *eCentre* took place at Flexenclosure's factory in Sweden, allowing all critical systems to be fully tested before shipping began.

Millicom says the 126 rack facility will support all of Tigo Chad's data and hosting requirements with a total power load of almost 1MW. It offers 374m^2 of floorspace for telecoms and data colocation services. If needed, the building itself can be expanded to double its initial capacity without impacting ongoing operations.

Flexenclosure's *eCentres*, such as this for MTN Côte d'Ivoire, are prefabricated in Sweden, allowing all systems to be tested before shipping.

The data centre has been built to withstand the extreme heat of N'Djamena, where daily temperatures are on average 40°C (more than 100°F).

"The extreme heat, sand and dust, and current lack of infrastructure all pose major challenges to mobile operators in the region," says David King, CEO, Flexenclosure. "With N'Djamena being so hot, we specifically designed the cooling system to cope with the high daily temperatures."

Millicom has also confirmed plans to develop a similar facility in Diamniadio in the Dakar region of Senegal. It will facilitate data exchange and storage, and will also support the government-led Plan Senegal Emergent which is designed to position the country as a leader in its sub-region.

Algeria gets connectivity boost to Europe

Sparkle will provide GÉANT with a 2.5Gbps circuit from Marseille in France to Annaba in Algeria, boosting the existing connectivity currently dedicated to Algeria's Research and Education network (ARN).

ARN currently interconnects more than 800,000 researchers and academics at 124 institutions across the country. Through its interconnection to GÉANT's pan-European network, ARN enables researchers, academics and students in Algeria to participate in top-level international research and educational activities. CERIST (Research Centre on Scientific and Technical Information), the organisation that manages ARN, has been part of GÉANT's network since 2004.

Sparkle is Telecom Italia Group's international services arm. The company has provided network solutions for GÉANT since 2002, supporting connectivity at research and education centres in different countries such as Tunisia, Morocco, Egypt, and others. Sparkle also currently provides GÉANT with 5Gbps connectivity to Brazil.

The operator says its "technologically advanced" fibre network of around 570,000km is one of the largest in the world.

Sparkle claims its open ecosystem and marketplace – the Sicily Hub in Palermo which is located in the middle of the Mediterranean basin – reinforces its strategic role in serving the growing capacity demand between Europe, Africa, the Middle East and Asia Pacific.

Imarasat expands broadband for SMES

Imarasat is aiming to expand its business internet services across 14 countries in sub-Saharan Africa with the help of satellite operator Avanti Communications.

Kenya-based Imarasat offers a Ka-band satellite broadband service which it says includes a "highly differentiated" QoS feature. The company claims this ensures real-time prioritisation of mission-critical applications for enterprise customers using its packet shaping technology which is implemented on hubs at Avanti's gateway ground stations. Imarasat says the technology avoids contention and the interruptions to enterprise broadband services associated with non-business traffic such as infotainment and peer-to-peer file sharing.

The company adds that it will particularly target what it sees as the "significant opportunity" presented by the growing SME market in countries such as Kenya. Citing statistics from Frost and Sullivan, Imarasat says it is estimated that 1.1 million SMEs contribute 45 per cent to Kenya's economy. However, it points out that almost 75 per cent of them do not have internet access, and are therefore unable to benefit from the growth and productivity gains that broadband can offer.

The firm adds: "32 per cent of SMEs are outside of 3G broadband coverage entirely. These SMEs are perfectly suited to satellite broadband services offered by Imarasat and Avanti."

Gilat Satcom helps connect 10 villages in Nigeria

The 'Community Hub' is a purpose-built communications block in each village.

Gilat Satcom is providing voice and high-speed data to 10 villages in the states of Adamawa, Borno, Kano, Katsina, Oyo and Yobe in Nigeria.

The company's *Village Island* system is being used to provide a full communications system that includes VSATs, Wi-Fi routers, solar power, two communal tablets per village, and service management.

Gilat Satcom is also providing the satellite connectivity to its VSATs in each village. The integrated Wi-Fi networks then provide local connectivity for data and VoIP to the tablets as well as to devices already owned by villagers and local businesses.

The entire setup is housed in the 'Community Hub', a purpose-built comms block in each village. Nigerian systems integrator Total IT Solutions is rolling out networks using *Village Island* as the infrastructure and service platform for these hubs.

The company's CEO Muhammad Yahya Sanda said: "*Village Island* is an extremely well-designed, self-contained system and key to the success of this project. [It] enables us to build low-cost networks which can easily scale with demand."

Total IT Solutions is working on behalf of Nigeria's Universal Service Provision Fund (USPF) and plans to introduce hundreds more networks across rural Nigeria using Gilat Satcom's system.

Telco Systems rolls out 10G for KENET

Not-for-profit telecoms operator Kenya Education Network (KENET) has successfully deployed a 10G high capacity carrier Ethernet network. It replaces the organisation's previous Layer 3 transport network.

The new system is claimed to give KENET greater bandwidth to support more traffic, and better serve its customers with "superior" SLA commitments and improved traffic engineering possibilities.

The network is managed by Telco Systems' *EdgeGenie Orchestrator* which is said to offer complete control over the service provisioning processes. It also features the vendor's *T-Metro 8001* service aggregation platforms and *T-Marc 3348S* demarcation devices, providing KENET with certified CE 2.0 services based on VPLS.

Epsilon hub for BringCom

Epsilon will deliver a complete communications hub for BringCom, providing interconnection with more than 500 operators across the globe. BringCom manages the Djibouti Teleport through a joint venture with Djibouti Telecom, and its MPLS network connects 17 countries in Africa. With an outsourced solution, Epsilon says the operator will be able to focus on developing its satellite and fibre infrastructure in emerging markets in Africa, the Middle East and the Caribbean.

Benin docs use SATMED

The Centre de Dépistage et de traitement de l'Ulcère de Buruli (CDTUB) in the remote area of Allada in Benin has deployed SES' SATMED telemedicine system. It will be used by Fondation Follereau Luxembourg (FFL) to communicate with doctors and medical experts globally, access online training tools, and establish facilities such as video conferencing, data collection and analysis. The deployment is part of FFL's efforts to establish a consultation office at CDTUB to improve communication between patients and medical staff, raising further awareness of tropical diseases.

Carrefour takes M-Pesa

Carrefour, the world's second-largest hypermarket chain, has become the first retailer in Kenya to fully integrate Safaricom's payments service – *Lipa Na M-PESA*. It paves the way for the retailer to fully adopt *M-PESA* as a payments channel in the country. Safaricom says customers at the store will now be able to complete payments without having to show evidence of an *M-PESA* message to staff, resulting in a faster and more efficient cashless transaction at the till. Carrefour joins more than 44,000 merchants actively using *Lipa Na M-PESA* in Kenya.

Orange Money transfers from France to Africa

Orange has launched its mobile money service in France. Users will not only be able to make fund transfers via their handsets to other *Orange Money* customers in metropolitan areas of the country, but also to those in Côte d'Ivoire, Mali and Senegal.

The operator says the launch comes in response to "strong demand" from its customers with family or friends in Africa.

It says the service will develop gradually and that it intends to increase the number of points of sale in France. There are already 41 across the country, including newsagents, call shops, local grocery stores and tobacconists, as well as an *Orange Money* store in Paris that was used in the pilot network that ran in July 2015.

This first store was fitted with technical solutions developed and managed by Aleda, Orange's long-standing wholesale partner for the distribution of pre-paid telephone offers. As part of the trial network, Aleda provided around 4,000 independent points of sale close to customers for paperless transactions such as mobile top-ups, electronic money codes and money transfers.

The launch of *Orange Money* in France is also supported by W-HA, an Orange subsidiary which is authorised to issue and manage electronic money.

The operator plans to release an *Orange Money* app in France soon, and adds that it will also look to expand the money transfer offer to other countries over time.

Orange Money users in France can now transfer funds to Côte d'Ivoire, Mali and Senegal. Recipients can withdraw money from more than 30,000 points in the three countries.

Djibouti Telecom optimises roaming

Djibouti Telecom will use a variety of solutions from Syniverse to gain visibility into and manage its end-users' experiences, while protecting the network from fraud and controlling costs.

The state-owned mobile operator will use the vendor's *Roaming Data Analysis-Visibility Services* for real-time access to roaming performance data through what's said to be an "easy-to-use" window that aggregates all subscriber data into a single view.

Djibouti Telecom will also deploy the *Forecasting and Budget Management-Optimizer*. Syniverse says this automates the planning, forecasting and budget process to help make the operator's roaming inter-operator tariff discount negotiations more profitable.

The firm adds that *Roaming Fraud Protection* offers Djibouti Telecom a managed service which includes an analyst team and a cloud-based application that monitors roaming data globally for suspicious behaviours 24 hours a day, seven days a week.

"With mobile users having more choices than ever before and with the demand for mobile service only increasing, it's critical for us to continually deliver value to our customers wherever they travel with their mobile devices," says Mohamed Assoweh Bouh, general director, Djibouti Telecom. "Our work with Syniverse will help ensure that we deliver the highest level of customer service."

Tigo Insurance reaches new milestone

Tigo says its mobile insurance service has now reached around 2.7 million active users across Africa.

Tigo Insurance products are available in Ghana, Senegal and Tanzania, and are delivered in partnership with mobile micro-insurance specialist BIMA. They are designed specifically to give lower income segments of the population access to life, hospitalisation and personal accident insurance.

Tigo says that 99 per cent of its insurance customers in Africa live on less than USD10 per day, and that around 73 per cent are new to insurance. The operator believes *Tigo Insurance* has "positively disrupted" the continent's traditional insurance industry, driving financial inclusion and bringing mobile micro insurance to customers who otherwise would not be able to afford it.

Tigo Insurance agents have signed up almost three million users in Africa.

For example in Ghana it's claimed *Tigo Insurance* has seen considerable success, having recently paid out its 10,000th claim. On average per month, *Tigo Insurance* is said to pay more than 300 claims through *Tigo Cash*, with valid claims going out within 72 hours after the submission of documents.

"Mobile network operators such as Tigo have the power to open the door to an entirely new and previously under-served market," says Paddy Partridge, regional manager for Africa, BIMA. "And the close partnership between Tigo and mobile insurance experts such as BIMA, guarantees that access is combined with high-quality education, technical delivery and claims support in providing these vital services."

Satellite used for comms in women's desert rally

Marlink will supply critical communications to the organisers of the Rallye Aïcha des Gazelles for another five years.

Taking place in March every year, the rally is a women-only race which attracts more than 120 teams from 30 countries. It covers 2,500km in six legs across the Western Sahara Desert in Morocco, making reliable satellite and radio comms services a top priority for both logistics and safety.

Marlink (which previously operated as Airbus Space and Defence) has been the event's turnkey communications provider for 25 years.

The company says its engineers ensure the smooth functioning of all comms services deployed in the field, with Marlink satellite links used to enable internet access for the organisers and media working in the camps.

Satellite connectivity is also used to provide VoIP at the control centre. As well as enabling recreational services, this also allows competitors to stay in touch with family and friends.

Organisational vehicles, such as those used by medical and support teams, are equipped with radio receivers so that they can communicate with HQ and be dispatched for prompt assistance to injured or stranded competitors.

Marlink also provides airborne radio networks for communications between field staff and the local control centre. Two helicopters cover each leg, transmitting duplex radio to fixed terrestrial relay stations.

Tracking and safety services are provided by the company's satellite-based *Iritrack* system. This enables real-time tracking of competitors, and also enables them to send alarms to HQ in the event of an emergency. Distress beacons are mandatory for all racers.

Mobile banking services roll out

In what's claimed to be the most extensive digital rollout of its kind in Africa by an international bank, Standard Chartered will bring its latest mobile and online banking platform to a million clients across eight countries on the continent.

The bank is launching the new platforms in Botswana, Ghana, Kenya, Nigeria, Tanzania, Uganda, Zambia and Zimbabwe. Users will be able to check balances, transfer money and pay bills securely via their mobiles, laptops or tablets. Standard Chartered also plans to launch fingerprint recognition technology in these markets later in the year, giving customers a more secure and convenient way to log in to their accounts.

The bank says the launch is central to its strategy of using digital technology to deliver the future of banking to clients in Africa. Last year, it announced it will invest USD1.5bn in technology globally over three years.

"We are committed to making banking easier, faster and safer for our more than one million retail clients across Africa," says Jaydeep Gupta, Standard Chartered's regional head of retail banking for Africa and the Middle East. "By early next year, we expect at least 35 per cent of all client transactions to be done through online channels, significantly advancing the transformation of banking in Africa."

In Kenya and Nigeria, Standard Charter also recently launched the *Retail Workbench*, a tablet-based sales-and-service tool that is said to "bring the bank to clients". The tool has been designed to enable sales staff to open an account for a client in any location, and to makes services such as loan approvals and credit card issuance fast, simple and paperless.

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Global mobile infrastructure market enters "post-LTE" era

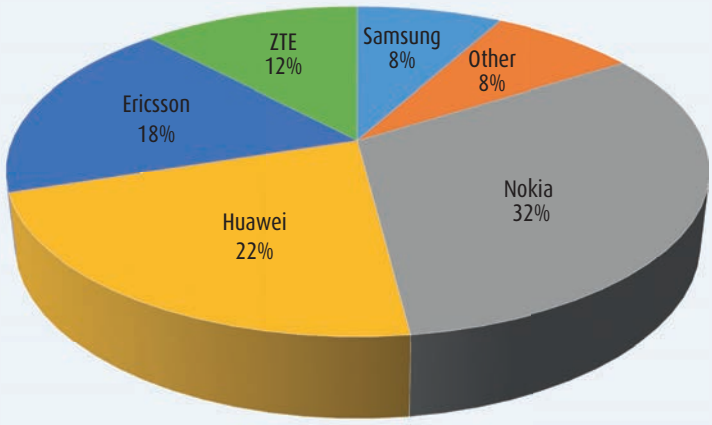
The global macrocell mobile infrastructure market declined 18 per cent in 1Q16, according to IHS Technology. But in a separate study, the analyst says the telecoms sector is likely to emerge as a leading source of capital expenditure for East Africa.

IHS says the global macrocell mobile infrastructure market was worth USD10bn during the first quarter of this year. That compares to around USD11bn for 1Q15 – an eight per cent downturn on a year-over-year basis.

Stéphane Téral, IHS Technology's senior research director for mobile infrastructure and carrier economics, believes the market has entered the "post-LTE peak era" with infrastructure for the technology seeing a decline of six per cent YoY.

"For the first time since the beginning of LTE rollouts in 2012, all generations of mobile technologies experienced a sharp decline," he says. "Even India, the only BRICS nation bright spot last year, slowed down dramatically in Q1 2016 due to spectrum issues and various deals between local mobile operators."

Téral adds that Ericsson retained its leading position in the macro 2G/3G/4G radio market in 1Q16, sustained by its mix of geographically distributed large tier 1 accounts. It was followed by Huawei at number two and then Nokia (including Alcatel-Lucent's share). All three companies also lead the global LTE infrastructure market, according to IHS (*see chart, above*).



Nokia and Huawei lead the global LTE infrastructure market with 32 and 22 per cent shares, respectively.

SOURCE: IHS © 2016

East Africa boom

In a separate report, IHS says East Africa's telecoms sector looks set to become more attractive for investors. It believes Tanzania presents cellcos with a "favourable" operating environment due to competitive licensing agreements, while in Uganda, the recent rollout of a regulatory framework for mobile and agency banking services provides new opportunities.

Kenya is particularly noteworthy. IHS says its government's commitment to encourage growth in the sector should improve competition and interoperability among existing MNOs and stimulate MVNO activity.

The firm adds that Kenya's telecoms infrastructure is largely concentrated in the south-east and west, but new projects could potentially drive 600,000 people to emerging areas of economic activity in the north-west, particularly in the Lake Turkana region, with consumer spending on mobile services expected to increase as a result. By forecasting population change and analysing population demographics, IHS identifies potential tower locations in three towns in the Rift Valley Province likely to benefit from the largest net increase in population: Lokichar, Kitale and Eldoret.

"These projects would create new centres of economic activity and employment opportunities," says Natznet Tesfay, director of sub-Saharan Africa analysis at IHS' economics and country risk division. "This example highlights how companies might miss faster growth and attractive opportunities in medium-sized cities if they only focus on the traditional major cities."

She adds that the refurbishment and expansion of the Lokichar-Kitale-Eldoret highway into neighbouring South Sudan will also increase opportunities for wholesale and retail trade, as will the UK-owned Tullow Oil's concession close to Lokichar which is due to start production by 2020.

MTN settles Nigerian dispute and appoints new CEO

Following the record-breaking fine imposed on it by the Nigerian Communications Commission (NCC) last year, MTN has now agreed a settlement with the country's Federal Government.

The NCC imposed a fine equivalent to USD5.2bn on MTN Nigeria for the untimely disconnection of 5.1 million subscribers last August and September. The situation led to Sifiso Dabengwa announcing his resignation as MTN Group CEO in November *(Wireless Business, Oct-Nov 2015)*.

As a full and final settlement of the matter, MTN Nigeria has now agreed to pay a total cash amount of NGN330bn (USD1.671bn) over the next three years. In addition, the operator has reiterated that it will ensure compliance with the NCC's codes of conduct and its license conditions. The company says it will also take immediate steps to ensure the listing of its shares on the Nigerian Stock Exchange as soon as commercially and legally possible.

With the NCC dispute resolved, the MTN Group has now named Rob Shuter as its new president and CEO. A South African national, Shuter has also held senior management positions at Standard Bank and Nedbank.

He will start his new role in 2017 after completing his current tenure as CEO of the European cluster at Vodafone Group. Phuthuma Nhleko, who had assumed the position of executive chairman following Dabengwa's resignation last year, will then revert to his post as non-executive chairman.

As part of an overall review of its governance and management structures announced earlier *(Wireless Business, Dec 2015-Jan 2016)*, MTN has also announced a number of other new executive and non-executive appointments *(also see New Appointment table overleaf)*.

MTN Group has named Rob Shuter as its new CEO. The firm says it will now resume its "rightful role" in increasing connectivity across Africa and the Middle East.

They include Godfrey Motsa who will oversee operations in the South and East Africa regions (excluding South Africa). Motsa joins from Vodacom where he was chief officer for consumer business. He has also previously served as CEO of Vodacom DRC as well as CEO of Vodacom Lesotho.

Eutelsat's African broadband venture backed by Inframed

InfraMed has become a shareholder in Broadband for Africa, the venture set up by Eutelsat to provide satellite broadband services on the continent.

InfraMed is a EUR385m investment vehicle dedicated to infrastructure in the southern and eastern Mediterranean. It was created in 2010 by Cassa Depositi e Prestiti, Caisse des Dépôts et de Consignations, the European Investment Bank, Caisse de Dépôts et de Gestion, and EFG Hermes.

The organisation has acquired around 21 per cent of Broadband for Africa. The value of the deal has not been disclosed. By investing in the venture, InfraMed says it is pursuing its strategy to focus on opportunities in regions characterised by dynamic demographics and infrastructure insufficiency.

Set up by Eutelsat in 2015, Broadband for Africa's mission is to provide affordable, high-quality broadband connectivity in Africa. The operator will lease Ka-band capacity on Spacecom's *AMOS-6* which is due to be launched later this year. During the second phase, Eutelsat will use resources on its own dedicated high throughput satellite which is expected in 2019.

Helios Towers secures funding for DRC

Helios Towers DRC (HTD) has upsized its syndicated term loan facility led by Standard Bank and German development finance institution, DEG (Deutsche Investitions- und Entwicklungsgesellschaft).

The firm's portfolio now includes around 1,800 towers with a growing pipeline of new builds for various operators. Its new USD105m funding facility will partly finance the acquisition of Airtel's tower portfolio, and will also be used to invest in power technologies to help HTD reduce reliance on diesel.

Since 2010, the company says it has pioneered the independent towerco model in the DRC through commercialising Tigo's former towers and building out new ones to which it will add around 950 towers as a result of the Bharti Airtel deal *(also see Wireless Business, Oct-Nov 2015)*.

This latest debt facility from Standard Bank for Helios Towers Africa follows the closing of a USD95m financing deal for its subsidiary in Tanzania earlier this year.

Liquid Telecom to acquire Neotel

In a move that will create what's claimed to be the "first pan-African fibre player", Liquid Telecom plans to acquire South African converged communications operator Neotel.

Liquid is partnering with investment group Royal Bafokeng Holdings (RBH) which will have a 30 per cent equity stake in the venture. Neotel's current owners – Tata Communications together with minority shareholders led by Nexus Connexion – have agreed a sale price of ZAR6.55bn (USD4.28bn).

Liquid said the acquisition will create the continent's largest broadband network comprising 40,000km of cross-border, metro and access fibre.

"For the first time, African companies will be able to connect with each other in a cost-effective and reliable way, all on a single fibre network," said Liquid Telecom CEO Nic Rudnick. "We will also be increasing investments into Neotel to cater for rapidly accelerating mobile and enterprise traffic, enabling us to launch new products and services."

Liquid Telecom Group CEO Nick Rudnick (left) said companies in Africa will be able to connect with each other on a single fibre network. Also pictured: Strive Masiyiwa (right), Econet Wireless Global and Liquid Telecom chairman; and Troy Reynolds (centre), deputy group general counsel for Tata Communications.

The transaction is subject to approval by South African regulatory authorities and is expected to be completed later this year.

In 2015, Vodacom announced plans to acquire Neotel but met with criticism from rival operators in South Africa. In its end-of-year results statement published in June 2016, Vodacom Group CEO Shameel Joosub said: "The proposed acquisition of Neotel lapsed in March due to regulatory complexities and certain conditions not being fulfilled."

Neotel runs a converged communications network which offers tailored services to enterprise users based on voice, internet and data. As well as fibre, the company operates data centres in Johannesburg and Cape Town, and directly connects South Africa's major centres to the world via all five undersea cables.

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
26/4/16	Orange	France	1Q16	EUR	10.0 (bn)	2.6 (bn)	0.6	Steady YoY revenue growth reported for Africa & Middle East at +4.4%. Overall earnings from the region for the quarter totalled €1,271m. Cellcom Liberia & Tigo DRC closed in April; announced disposal of Telkom Kenya last year; has acquired Airtel's subsidiaries in Burkina Faso & Sierra Leone.
5/5/16	Globalstar	US	1Q16	USD	21.8	4.9	NA	Total revenue during grew 4% compared to $21m reported for 1Q15. Increase was driven by higher service revenue resulting from 6% growth in subscriber base, offset partially by decrease in revenue generated from equipment sales.
29/6/16	NuRAN Wireless	Canada	1Q16	CAD	1.51	0.0037	NA	Revenue decrease of around 27% from Q215 partly attributable to a temporary shift of resources towards acquisition of key technology. In late May, the rural connectivity specialist opened its first office on the continent (Windhoek, Namibia) & appointed Bradley Shaw as regional manager for MEA.
19/6/16	Ericsson	Sweden	2Q16	SEK	54.1 (bn)	4.22 (bn)	0.48	Overall sales down by -11% YoY. In sub-Sahara Africa, sales declined due to lower investment levels, impacted by slump in oil prices & ramping down of a "sizable"mobile broadband project in South Africa. Company will "intensify" activities to reduce cost of sales & adapt operations to a weaker mobile broadband market; further job losses feared; Vestberg steps down (*see table opposite*).
27/7/16	Bharti Airtel	India	1Q16	INR	255,465	95,913	3.66	Total African revenues of INR62,493m reported for fiscal first quarter that ended in June. That compares to INR61,595m for 1Q15. Devaluation of Nigerian naira by 42.1% during the quarter resulted in forex losses of INR7,479m (net of minority interest).
5/8/16	MTN Group	South Africa	1H16	ZAR	78,878	29,273	2.50	Revenues increased 1.5% at constant currency but results significantly impacted by the Nigerian regulatory fine which has now been settled. Group subscribers remained flat at 232.6 million from 31 December 2015.

VimpelCom and Ericsson in billion dollar software partnership

VimpelCom is aiming to "radically transform" its global IT infrastructure following a software deal worth more than USD1bn with Ericsson.

The partnership encompasses a complete overhaul of VimpelCom's IT infrastructure across 11 countries on a scale that is claimed to be the "largest and most ambitious" in the industry's history.

Under a seven-year deal, Ericsson will digitalise and globalise VimpelCom's BSS infrastructure using new software and cloud technologies. The operator says this Digital Stack will accelerate product and service development, enabling it to fast-track its digital innovation strategy, particularly in the areas of mobile entertainment, communication, IoT, and mobile financial services. The company adds that the delivery and use of near real-time analytics will allow greater personalisation of services for subscribers.

VimpelCom expects the move to result in a significant reduction in opex across the group. Going forward, the operator says that by year three it will reduce its IT expenses (opex and capex) by more than 50 per cent down to a ratio of around two per cent of total revenue.

IN BRIEF...

The Mobile Ecosystem Forum (MEF), says a third of mobile media users in Nigeria have paid to increase their data packages in the last six months fuelled by an increasing appetite for apps and entertainment services. In a survey examining the behaviours and attitudes of the country's smartphone users, the forum found that almost half of respondents buy more than 2GB of data per month. Of those who have paid to get access to more data, most want it to download apps (64 per cent), watch video (52 per cent) and stream music (31 per cent).

SEACOM is leveraging capacity on its undersea cable system and continent-wide IP-MPLS network to enable businesses in South Africa and East Africa to smoothly transition to the cloud. Its next step will be to ramp up the rollout of business solutions in Kenya, and to start looking at growth opportunities in Uganda, Mozambique, and Tanzania.

Based on its Stock Option Plan 2011, Nokia Corporation says a total of 314,150 shares were subscribed for between 1 January and 15 June 2016. Subscription prices ranged from EUR5.76 to EUR1.86 per share, amounting to a total subscription price of EUR1,022 814. The total number of Nokia shares now recorded in the Trade Register is 5,835,536,262. At its AGM held in mid-June, the company agreed to distribute a special dividend of EUR0.10 per share in addition to an ordinary dividend of EUR 0.16 per share for the 2015 financial year.

INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
26/5/16	Flexenclosure	European Investment Bank	Finance deal	EUR7.5m	Loan will support expansion of Flexenclosure's R&D activities in intelligent power management systems and prefab modular data centres. Swedish firm's key markets include sub-Sahara Africa, Latin America, & central & South East Asia.
13/6/16	Microsoft	LinkedIn	Company	USD26.2bn	Microsoft believes acquisition of "world's largest & most valuable" professional network will complement its line-up of enterprise products & services.
22/6/16	Orange	Airtel	Burkina Faso & Senegal operations	NA	Orange's take over of Airtel's Burkina Faso & Senegal operations has now met all approvals & has been finalised. In January 2016, Airtel agreed to sell 100% of its operations in the countries to Orange. It did not disclose a price although a sum of around $900m was subsequently reported.
4/7/16	SES	O3b Networks	Shares	USD730m	Following the increasing of its shareholding earlier this year, SES has now received all regulatory approvals to acquire the remaining shares and warrants of O3b. Its fully diluted ownership has now increased from 49.1% to 100%.

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
7/6/16	Marcio Saito	Opengear	CTO	Cyclades	CTO
20/6/16	Rob Shuter	MTN Group	President & CEO	Vodafone Group	CEO of European cluster
23/6/16	Abdelkrim Benamar	Astellia	CEO	Astellia	COO
23/6/16	Christian Queffelec	Astellia	Chairman	Astellia	CEO
23/6/16	Connor Smyth	Simoco Group	Business development manager, EMEA utilities	Ultra Wood & Douglas	Sales & marketing account manager
1/7/16	Sateesh Kamath	Safaricom	CFO	Vodacom Tanzania	CFO & executive director
4/7/16	Stephen van Coller	MTN Group	VP strategy & M&A	Barclays Africa CIB	CEO
4/7/16	Christian Leicher	Rohde & Schwarz	President & CEO	Rohde & Schwarz	Executive board member
12/7/16	Gary Aitkenhead	Sepura	VP devices	Motorola	VP of global managed services
12/7/16	Michelle Lamprecht	Sepura	VP marketing	The MathWorks	Marketing manager Northern Europe
14/7/16	Eran Yoran	–	–	Gilat Satcom	Chief marketing & business development officer – stepping down
25/7/16	Hans Vestberg	–	-	Ericsson	CEO – steps down. Jan Frykhammar takes over until successor is found.
4/8/16	Kjell Morten Johnsen	VimpelCom	Head of major markets	Telenor	Head of Europe

Cambium platform promises fibre-like throughput

The *PMP 450m* is the first product to feature Cambium Networks' *cnMedusa* technology. This has been developed to enable operators to offer what's claimed to be 5G-like speeds surpassing DSL and cable while offering throughput comparable to fibre.

According to the firm, *cnMedusa* is the first commercially available Massive Multi-user (MU) MIMO platform for fixed wireless broadband. It says the technology's 14x14 integrated antenna array exceeds both 802.11AC Wave 2 and LTE-A planned implementation of 8x8, and yields the ability to support up to seven simultaneous carrier chains. Cambium adds that the integrated sector antenna cuts capex as well as opex in installation and recurring tower fees.

It goes on to say that the *cnMedusa*-enabled *PMP 450m* offers "unprecedented" spectral efficiency of more than 20bps/Hz, and more than 40bps/Hz when deployed in frequency re-use configurations.

Cambium also says the platform offers a three- to four-fold increase in network capacity, with more than 400Mbps in a 20MHz channel.

The new *PMP 450m* works with existing *PMP 450* subscriber modules and only requires changing out the access point. Cambium adds that the entire system can be managed via a single pane of glass in the cloud.

MANUFACTURER: Cambium Networks

PRODUCT: PMP 450m

MORE INFORMATION: www.cambiumnetworks.com

MicroPoP offers fast wireless broadband to urban areas

Mimosa reckons its *Micro Point-of-Presence (MicroPoP)* network architecture enables service providers to deliver gigabit wireless broadband and achieve the same speeds as fibre for a fraction of the cost. The system combines Mimosa's new *A5* access point and the *C5* client device.

With its "unique" quad-sector antennas and massive MIMO technology, the compact *A5* is claimed to be the industry's fastest multipoint solution purpose-built for high-density deployments, and offers more than 1Gbps of aggregate capacity. It can be deployed in a central point within a neighbourhood to provide wireless broadband connections to subscribers within 500 metres.

Both the *A5* and the *C5* feature GPS sync-enabled TDMA. This ensures that each client device precisely receives and transmits under the AP's timing control. Mimosa says this also eliminates the possibility of interference from other *A5*s in the vicinity.

The *C5* endpoint is also MU-MIMO capable which means that multiple clients on the same AP can be coordinated to simultaneously share spectrum, thus improving scaling and spectral efficiency.

With protection from harsh environmental conditions and a wide-range of mounting options, Mimosa adds that the units are suitable for "any deployment situation".

MANUFACTURER: Mimosa

PRODUCT: MicroPoP

MORE INFORMATION: http://mimosa.co

EtherHaul-500 "ideal" for congested 5GHz networks

Siklu, which specialises in millimetre wave wireless solutions, has launched what it describes as an "affordable" V-band radio for interference-free connectivity on the street. Operating in the 60GHz band, the new *EtherHaul-500* is claimed to be "perfect" for upgrading congested 5GHz networks.

The radio is designed to provide 200Mbps of real time connectivity. It utilises the ample 9GHz-wide V-Band spectrum with 11 non-overlapping full-capacity channels, which are also user-selectable.According to Siklu, the 60GHz band is characterised by abundant license-free spectrum, minimal reflections, and narrow beamwidth. It says all this enables dense link deployment.

The spectrum also provides predictable performance as it experiences no beam interference. The firm says this is an advantage for mission-critical environments, such as transmitting data from HD/4K video surveillance cameras and other safe city sensors.

MANUFACTURER: Siklu

PRODUCT: EtherHaul-500

MORE INFORMATION: www.siklu.com

Planning tool saves time and money on rollouts

Ranplan has released a new version of its all-in-one planning, optimisation and simulation tool for indoor and outdoor radio networks.

iBuildNet 3.1 adds a range of new features including carrier aggregation, HSPA+, enhanced Wi-Fi planning capabilities, Smart CAD functions, and support for LTE-A key standards such as MU-MIMO and CoMP.

The enhanced tool is said to allow users to perform cross-system design and simulation with accurate modelling of coverage, traffic steering and handover between LTE and Wi-Fi systems.

According to Ranplan, this means indoor and outdoor Wi-Fi and cellular networks can be planned in co-ordination, reducing the time and cost of deployment and ensuring support for future heterogeneous technologies and standards.

The Smart CAD features include automatic extraction of walls, doors, windows and floors from complex CAD files to create more accurate building models. It's claimed this new capability alone can reduce the time it takes to model the building environment by more than 50 per cent.

iBuildNet's material database has also been enhanced to enable the design of networks operating in spectrum up to 6GHz. And with the advanced *Wireless Network Simulator*, engineers can now plan a user-centric model rather than a cell-centric one.

MANUFACTURER: Ranplan

PRODUCT: iBuildNet 3.1

MORE INFORMATION: www.ranplan.co.uk

DMR simulcast system needs just one pair of frequencies

Hytera says its latest DMR solution offers a cost-effective option for suppliers, local public transport networks and municipalities to modernise their radio systems.

The *DS-6310 Simulcast* system has been developed using the DMR Tier II standard. It consists of a mobile switching office (MSO), base station *(pictured)*, dispatch system, a central network management system, service terminals and bearer network. Hytera says one MSO supports up to 100 base stations or 200 carriers, while a single DMR simulcast base station can support up to two carriers.

The company says a simulcast technique means that only a single pair of frequencies is needed (one for TX and one for RX) regardless of the number of base stations in the network. The DMR standard's two-slot TDMA technique supports two simultaneous communications on a single 12.5kHz channel which makes it possible to hold two conversations at the same time on a single frequency.

The platform's IP-based architecture is said to enable flexible networking. Multiple transmission links can be used between base stations and the MSO, such as IP, E1, microwave, wireless bridge, etc. Standard SIP and RTP are used to interconnect with other systems such as those used for PSTN and DMR trunking.

MANUFACTURER: Hytera

PRODUCT:
DS-6310 Simulcast

MORE INFORMATION:
www.hytera.com

Proxim launches long-range PTP link

Proxim Wireless has developed a long-range version of its carrier class *Tsunami QuickBridge* backhaul product.

The new *Tsunami QB-10150-LKL* features a 28dBi high gain integrated antenna that is claimed to allow links in excess of 35km to be deployed. Proxim adds that compared to rival products with lower antenna gain, shorter range connections will also benefit from the *QB-10150-LKL*'s higher modulation rates and resulting higher data throughput.

The new version continues to support all the key features of the company's *QB 10100* series. This includes: high capacity usable throughput of 650Mbps; the ability for customers to select a wide frequency range from 5.15GHz to 5.85GHz in a single model; and *WORP*, Proxim's software that allows multiple traffic streams with varying QoS needs to be bundled into one link.

In addition, the *QB-10150-LKL* supports IEEE 1588 pass through and Jumbo Frames, which are common carrier requirements.

Like all *Tsunami* radio products, the device also uses *Proxim ClearConnect* which helps it to withstand all but the most hostile RF environments. The *QB-10150-LKL* can operate in temperature ranges from -40°C to +60°C, and is contained in an IP67 rated enclosure.

MANUFACTURER:
Proxim Wireless

PRODUCT:
Tsunami QB-10150-LKL

MORE INFORMATION:
www.proxim.com

RFS introduces next-gen combiner range

Radio Frequency Systems (RFS) has enhanced its range of *ShareLite* combiners. The new models support additional wideband frequencies and include features such as DC sensing-AISG bypass and compatibility with the 4.3-10 standard.

RFS reckons its combiners are "ideal" tools for any feeder or antenna sharing solution and help wireless operators adapt their infrastructure for 4G technologies. It says the combiners are compact and lightweight for easy handling, and their rugged design allows for outdoor use and increases product longevity.

According to the firm, automatic DC sensing and AISG bypass bring increased flexibility to site installations. It says they allow combiners to automatically adjust to site requirements and route DC and control signals through the antenna line system as appropriate, thereby ensuring the right bypass for any installation.

RFS adds that the latest models in its *ShareLite* portfolio have extremely low insertion loss and a high level of rejection between bands for maximised performance. They also accommodate many new frequencies as well as combined ones.

The entire range is available with the vendor's 4.3-10-style connectors, allowing operators to achieve the highest performance with the new interface standard.

MANUFACTURER:
Radio Frequency Systems

PRODUCT: ShareLite

MORE INFORMATION:
www.rfsworld.com

ALSO LOOK OUT FOR

Qualcomm unveils 5G sub-6GHz prototype system

Qualcomm Technologies has developed a 5G 'New Radio' (NR) prototype system and trial platform that operates in the sub-6GHz bands.

The company says the aim is to create a unified and more capable 5G air interface. It says designs implemented on its prototype system will be used to drive 3GPP standardisation for a new, OFDM-based 5G NR air interface.

The system will closely track 3GPP progress to help achieve timely 5G NR trials with operators, infrastructure vendors and other industry players, as well as future 5G NR commercial network launches.

The platform itself consists of both a base station and user equipment, serving as a testbed for verifying 5G NR capabilities. Qualcomm says it supports wide RF bandwidths over 100MHz that are capable of delivering multi-gigabit per second data rates.

It also supports a new integrated subframe design for what's claimed to be "significantly" lower over-the-air latency than what is possible in today's LTE network.

5G will make the best use of a wide range of spectrum and, according to Qualcomm, utilising frequencies below 6GHz is a critical part of allowing for flexible deployments with ubiquitous coverage and many use cases.

The firm says the prototype system continues the development and testing of its 5G designs which are contributing to 5G NR 3GPP standardisation. The 3GPP 5G NR study item has begun as part of Release 14 and will feed into Release 15 work items.

The prototype adds to Qualcomm's existing 5G mmWave prototype system. This operates at 28GHz and is said to be capable of "robust" mobile broadband communications in non-line-of-sight environments, utilising advanced beamforming and beam-steering techniques.

4G or not 4G?

Specialists such as Airbus Space and Defence believe the hybrid network approach is the right way to look at the role of LTE in a PMR environment.

...that is indeed the question. But what are the challenges of using LTE for public safety networks? RAHIEL NASIR discovers there's a long way to go before 4G can replace established PMR technologies such as TETRA.

Over the last few years, LTE has come under increasing focus in the two-way radio industry – could this cellular technology be used by critical comms users in place of more established PMR platforms such as TETRA?

According to Raquel Frisa, LTE and broadband services product manager for Sepura, the international regulation and industry bodies are determined to adopt LTE as the key technology offering complimentary broadband applications to current voice plus data and direct mode operation applications in mission-critical scenarios. "However, we foresee that the first professional deployments – 'LTE-based' and compliant with standard PMR functionality – will take more than five years and may not even be deployed until 2025."

Like many TETRA specialists, Sepura believes hybrid network solutions – a combination of narrowband and broadband technologies – will mean TETRA and LTE will co-exist for several years. But in some parts of the world things are already changing.

For example, earlier this year in the UK, the government began implementing a GBP1bn programme that will see the TETRA system used by the country's emergency services replaced by an LTE network. It will be provided by EE – the mobile operator that was originally setup as a joint venture between Orange and Deutsche Telekom (T-Mobile) in 2010 and acquired by BT (British Telecom) last year. EE claims its 4G network will "significantly improve" the efficiency of the emergency services by giving them access to the type of data and applications that have benefitted private businesses in recent years, and which have not all been possible using TETRA.

No substitute for TETRA

So does that sound the death knell for TETRA? Not quite. Motorola Solutions (which, incidentally supplies technology to the UK emergency services and has been appointed services partner under the new programme) believes PMR will always be the "fail-safe" communication technology when it comes to public safety. Tunde Williams, the company's head of field and solutions marketing for Europe

and Africa, says LTE will gradually integrate as an additional technology for public safety agencies. As a result, he reckons one of the biggest challenges for LTE is bridging between the two technologies.

Tunde adds that other challenges vary around the world, and could be issues like government spectrum designation, or integration challenges that are typical for any new technology deployment.

According to the TETRA and Critical Communications Association (TCCA), legal restrictions could severely limit possibilities of using LTE technology for public safety networks. As an example, Tero Pesonen, chairman of the association's critical communications broadband group, says some interpretations of the EU net neutrality directive prevent using commercial LTE radio access as part of the solution as public safety traffic is not allowed to be prioritised over consumer traffic. He says this would therefore leave field operatives vulnerable in cases of network congestion.

This strikes a chord with Jochen Bösch, head of support and product management at DAMM. He believes that one of the main challenges with using LTE is frequency scarcity, especially where large spectrum is required to support high data throughput. But he adds that in most cases, this is a "nice to have" rather than a "must have", as TETRA technologies such as TEDS have the same spectral efficiency as LTE and can cover the mission-critical data needs.

Jochen Bösch, Head of support and product management, DAMM

"Maybe LTE becomes successful on a nationwide public safety network. But at its current stage, it will have almost no chance in private industrial segments."

Another issue for Bösch is actual network coverage. He says that compared to TETRA, the number of sites required with LTE is at least 10 times higher.

As a result of all these challenges, most experts in the PMR industry expect it to be some time before complete and mature LTE-based solutions become available. Airbus Defence and Space (ADS) adds its voice to the debate with the assumption that it will take around five years for LTE to reach the mission-critical maturity level of today's TETRA and TETRAPOL services.

Kai Schlichtermann, the company's spokesperson for secure land communications, says: "This relatively long period is needed for 3GPP to standardise the needed technology enablers and applications for mission-critical communication. The industry also requires significant time for product implementation and verification. In addition, trialling and piloting activities are needed to make sure that new solutions match well to the requirements of mission-critical users, use cases and operational processes. All this needs to be done before new solutions can be switched to operational use."

Motorola Solutions says its *LEX L10* (left) portable combines PMR features with capabilities more often associated with smartphones. It can be used with the *VML750* LTE modem (above) which connects equipment in a vehicle to the public safety LTE network.

More information needed

In the meantime, Sepura's Frisa says hybrid models based on mobile virtual operations may appear – indeed this is already happening in Finland and Belgium. But she believes it is unlikely that public safety agencies will completely replace existing networks with this model.

According to the TCCA, the LTE technology that is available across commercial networks today is suitable for complementary, non-mission critical data services for public safety users. This is perhaps where the "bridging of technologies" that Motorola's Wiliams refers to above comes in.

But the TCCA goes on to point out that in order to harvest the benefits of LTE for field operations, the technology needs to become more information centric rather than voice centric. Pesonen says this is probably the most difficult challenge. So how can LTE integrate with legacy PMR technologies that are already in place?

"A lot can be done to gain synergies when narrowband PMR technologies are run in parallel with LTE, he says. "There are implementations that enable joint subscriber management, and use common transmission and sites. There are even proprietary implementations from a number of companies enabling group linking between TETRA and LTE as well as some terminal products that

Left: Airbus Defence and Space's standalone *Tactilon Cell* can be used to create a small LTE network. It comprises a base station, terminals, LTE software and an app server for mission-specific apps. All the cell's features comply with 3GPP standards. Right: the recently launched *Dabat* integrates a complete TETRA radio and smartphone in one device. Airbus says it can work on any TETRA network.

support both TETRA and commercial LTE."

However, Pesonen says much more needs to be done in these areas. For instance, he says 3GPP has recently accepted a study item to address the interworking between TETRA/P25 and LTE. This will enable the definition of official standard interfaces for exchanging mobility management and content information such as group and individual calls, as well as short data services.

But as Sepura points out, this feature is at an early stage and it does not expect to see the specification completed until further releases. So until such time as all the challenges have been met, specialists are developing PMR infrastructure that adds LTE radio access as an overlay to existing TETRA.

For example earlier this year, Sepura itself announced that its *eNEBULA* platform is now offered as a hybrid system for mission-critical voice and data, or in some cases as a pure LTE system for broadband data services.

The company says *eNEBULA* is based on multi-manufacturer open standards, offers multi-technology capabilities within a single network, and has been developed according to ETSI and 3GPP specifications and recommendations for TETRA and LTE radio access. The system allows the sharing of real-time video from urban, mobile and body-worn cameras. Sepura claims it complies with the "most demanding" regulations for military grade equipment, and is built to withstand the "harshest" conditions.

Tero Pesonen, Chairman broadband group, TETRA & Critical Communications Association

"A lot can be done to gain synergies when narrowband PMR technologies are run in parallel with LTE... There are even proprietary implementations."

"Our portfolio also includes hybrid solutions for terminals: the *MVC-6000*, a multi-technology vehicular console integrating TETRA and LTE, as well as our *SC20*, which is an LTE-ready TETRA hand portable," says Frisa.

Other TETRA manufacturers are also adding LTE support to their products. For instance, DAMM's Bösch says the technology can be easily integrated as a data backbone supplement via applications and gateways. "Depending on the integration on terminals, users in the future might just be required to wear one terminal for TETRA as well as for LTE coverage. The TCCA is working on a per protocol integration, but as the LTE standard for mission-critical comms is not fully finalised and released, this integration will last several years."

Integrating LTE

Motorola Solutions is a firm advocate of integrating LTE and PMR. Williams says: "We have made 'bridges' that make it possible for PMR products (radios) to communicate with LTE devices (smartphones/tablets/computers). Our *WAVE* product is an application that allows any radio to communicate with any other device, including smartphones, laptops, tablets and computers."

WAVE has been designed to provide a secure PTT platform for group communications. Motorola says it offers the ability to integrate with LMR, cellular, Wi-Fi, etc., making it possible for teams to use secure voice and data services regardless of network, carrier or device.

Meanwhile for Airbus, the hybrid network approach allows the secure and efficient integration of new devices and services with existing narrowband solutions. The company says it is currently working very closely with 3GPP to develop products that are in line with current and future industrial standards.

"Sharing existing TETRA or Tetrapol sites and IP backbones with broadband solutions is a decisive vehicle for smooth evolution, efficiency and cost savings," says Schlichtermann. "In fact, the hybrid approach means public safety organisations will continue to use TETRA or Tetrapol network for mission-critical voice and short data, and introduce mobile broadband services gradually, utilising and combining different mobile broadband implementation options."

Earlier this year, ADS unveiled a range of products that are said to be enable PMR network users to smoothly evolve from narrowband to mission-critical broadband.

The new *Tactilon* suite includes products that have been designed to help end-users to communicate effectively using LTE services. For example, ADS says the new *Dabat* integrates a complete TETRA radio and a rugged smartphone in one device. It features mission-critical functions, touchscreen, and front/back cameras. The vendor says the radio module offers all the functionalities once found only in TETRA devices, and can work on any standard TETRA network.

Some of the other products in the *Tactilon* suite include *Agnet*, ADS' multimedia communication application for smart devices. While bringing together established PMR services such as PTT and multimedia sharing via broadband, *Agnet* is also fully compliant with 3GPP standardisation. The company says this enables users to communicate with each other either via a PMR radio or a smart device.

ADS therefore believes the hybrid network approach is the right way to look at the role of LTE in a PMR environment. And Schlichtermann says it will evolve: "LTE will substitute narrowband services entirely to a great extent at some point in the future. But as yet, nobody knows when this will exactly happen or how it will be done."

So will a new breed of PMR spawned by the marriage of LTE and TETRA eventually supersede traditional platforms? To answer this, DAMM's Bösch says you need to differentiate between networks for public safety and those used for mission-critical industrial operations.

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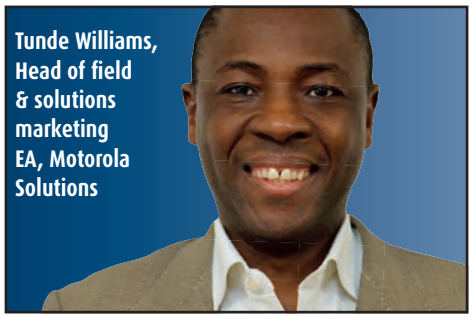
"Maybe LTE becomes successful on a nationwide public safety network. But at its current stage, it will have almost no chance in private industrial segments, where TETRA and DMR will continue to be the key solutions for mission- as well as business-critical communication. If an LTE standard is finalised, frequencies become available, and markets are asking for LTE base stations, we will evaluate this."

Having said that, DAMM says its *TetraFlex* system already enables customers to integrate any LTE vendor infrastructure to it. They can then utilise TETRA's mature voice capabilities and enhance this with LTE data capacities. Or they can use the systems to extend voice and data communication coverage via a public LTE network using *TetraFlex* soft client apps that can run on many commonly available smartphones.

"With the current uncertainties in the market it is key to have open interfaces and open scalability towards the future, not only on capacity but also on technology," says Bösch. "*TetraFlex* is not just one technology – it integrates TETRA, TEDS, analogue and DMR into one platform, and further technologies can and will be added when the time for them has come. This avoids our clients from investing twice or being kept in a vendor lock, offering a scalability and flexibility exactly according to their needs within the given technical possibilities."

Schlichtermann echoes this view. He believes that the key for manufacturers to succeed in mission-critical communications is to completely understand the user's requirements. For Motorola Solutions, some of the key considerations here are the customer's budget, availability of spectrum, technology availability and suitability.

"From a technology point of view, the latest releases of LTE coupled with *WAVE 7000* will offer many of the features customers enjoy on an PMR system but not necessarily all," says Williams. "So it really depends on the customer's operations, what they need the technology to do, and a good understanding of 'what's good enough' for their deployment. For some that could be LTE. But many will continue to rely on TETRA for voice, and will deploy LTE for applications requiring high-speed data."



Tunde Williams, Head of field & solutions marketing EA, Motorola Solutions

"Many will continue to rely on TETRA for voice, and will deploy LTE for applications requiring high-speed data."

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One of Motorola Solutions' key public safety LTE products is the *LEX L10*. Williams says this purpose-built portable broadband device combines the features of the company's rugged first-responder radios with capabilities more often associated with smartphones. "Together with the *VML750* LTE vehicle modem which connects equipment in a vehicle to the public safety LTE network, it facilitates unique applications. It delivers LTE voice services and real-time multimedia with full dynamic resource prioritisation, while ensuring full data security both in the office, on the street and in the vehicle."

End-of-life for TETRA

TCCA's Pesonen says TETRA has been the dominant critical communications standard during this decade, and predicts that it will continue to be so for narrowband spectrum during the 2020s. He adds that as the standardisation of critical features advances in 3GPP, it will be possible to do increasingly more with LTE. "It is expected that 3GPP LTE Release 15 functionality is sufficient to operate critical communication exclusively on LTE in large scale – limited use may be possible already with a smart implementation of Release 13."

However, Pesonen goes on to say that the installed public safety TETRA/Tetrapol networks in many European countries will reach their technical end-of-life by 2030. Which means that those countries will need to have switched to a critical communications broadband service by such time, or will have to re-invest in their current technology.

"This sets the deadline for the narrowband broadband transition window. The starting point is when the LTE implementations meet the requirements and the relevant frequency spectrum is available. This is expected to happen in the early part of the next decade at larger scale."

Pesonen says that in order for user organisations to move from their current mission-critical TETRA networks to LTE requires a great deal of trust – they need to ensure that they can continue to conduct their duties with, at the very least, the same levels of safety, security and efficiency as before.

"Therefore, it is imperative that LTE with high availability coverage is available with the critical features. Also, as this kind of transition processes tend to be very complicated on the administrative side, the interworking aspects of LTE and legacy PMR systems need to be solved. Finland is an example of a country that has already made a strategic guideline how to take steps to prepare the transition."

Clearly then, the 'traditional' PMR technologies are here to stay. And as Frisa states, Sepura does not envisage a medium-term replacement of narrowband technologies such as TETRA, P25 or DMR. "We think there will be a decade of co-existence of both narrowband and broadband LTE technologies. And later on, we forecast that there will be a market for them even when the PMR LTE specification is complete." ■

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Mobility solutions

Project Isizwe has enabled the installation of free Wi-Fi on board buses operated by A Re Yeng in Tshwane, South Africa.

From road and rail to sea and air, wireless communications travel across huge distances to keep man and machine connected.

Geneva-based Cotecna specialises in solutions that help governments combat fraud, protect customs revenue, maintain internal security, and facilitate lawful commercial exchanges at national borders. It also provides the private sector with a wide range of testing, inspection and certification services, as well as assistance in trade finance services and e-documentation.

Over the last few years, the company says its business has expanded significantly in the private sector. To stay competitive, it developed a five-year digital transformation plan to simplify and reduce the administrative work of customs agents.

With its network at the core of this plan, Cotecna needed a partner with a global footprint that could reach remote sites, particularly in Africa. It contracted Orange Business Services (OBS) and now uses the company's hybrid network solution that incorporates satellite connectivity. It comprises a business VPN with satellite and internet for 53 Cotecna sites in 29 countries across Africa, Asia and Europe.

Orange M2M devices are attached to Cotecna's vehicles and allowing quasi-real-time monitoring to ensure boxes in transit remain unopened and vehicles stay on schedule.

In addition to the hybrid network, OBS has also helped Cotecna extend its *Cotrack* system into Burkina Faso and Senegal with local machine-to-machine connectivity. The system uses what's described as a "best-in-class" M2M track and trace solution that keeps goods secure and monitored wherever they are.

Cotecna wanted to enhance its transit monitoring services by using M2M technology to give its clients, such as customs authorities, greater reassurance and increased security when monitoring their goods.

According to OBS, legacy customs transit monitoring solutions were unable to prevent modern fraud techniques. It says the industry lacked adapted technologies that could track and monitor vehicles or merchandise along specific routes. What Cotecna needed was a solution that could monitor vehicles and cargo across borders, and could offer more than just basic fleet management capabilities to customs.

To address this, the company partnered with OBS to develop and implement a comprehensive system that monitors all transit operations per specific customs requirements.

With more than 200 dedicated M2M experts on hand offering expertise in consulting, design, innovation, integration, project management and service management, OBS says it was able to demonstrate to Cotecna that it had the skills required to design, build and operate an end-to-end solution. The purpose-built track and trace system it developed builds on the *Orange Intelligent Apps Enabler* platform and supplies best-of-breed hardware and software. M2M devices are attached to vehicles or containers passing through customs, allowing quasi-real-time monitoring of goods to ensure boxes remain unopened and vehicles stay on schedule. Orange is also responsible for integrating the solution into local GSM and internet networks.

The M2M track and trace solution has resulted in a reduction in the number of false transits. That means more goods become legally available for consumption, and it also increases competitiveness for countries engaged in international trade by reducing non-tariff barriers.

Under a long-term partnership, Cotecna and OBS will roll out the tailored track and trace solution to organisations with transit monitoring needs in developing countries. They also plan to co-market the system across other territories.

Arik Air takes off with Hytera DMR

Established in 2006, Arik Air now has a fleet of 26 aircraft including two Airbus *A340-500*s and offers flights to 28 different domestic, regional and international destinations. The firm operates from two main points in Nigeria: Murtala Muhammad International Airport in Lagos, and Nnamdi Azikiwe International Airport in the state of Abuja.

In order to guarantee flight safety and quality of services, Arik Air needs to carry out bridging, catering, chocking, comprehensive checks, maintenance, etc., after its aircraft is parked.

Arik Air operates a fleet of 26 aircraft including two Airbus *A340-500*s. Its airport operations in Nigeria rely on Hytera's DMR *RD98X* repeaters (below) and *PD70X* portable radios (left).

The workflow is complex and needs coordination from different departments. It therefore needed a reliable wireless communication system to provide unified communication and improve efficiency.

With its wide experience of deploying comms systems to the aviation industry, Arik Air chose Hytera to provide the solution. The company provided a DMR conventional system that include three of its *RD98X* repeaters and 140 *PD70X* portable radios.

The repeaters were installed at the two airports in Nigeria and interconnected by IP link. With Hytera's DMR conventional system, staff from different departments and different airports are able to communicate with each other, share information instantly, and take effective action as appropriate.

With the combined application of narrowband codec and digital error-correction technologies, Hytera says its DMR products provide large area coverage between the two airports, and claims that they ensure "superior" voice quality even in the noisy airport environments. Security is said to be guaranteed with the advanced intrinsic encryption of DMR's digital technology, thus ensuring confidentiality of every call for Arik Air.

Hytera says that because DMR benefits from TDMA technology, it doubles the channels based on the same spectrum resource. The system can therefore use Arik Air's existing frequencies and no other site is required, resulting in cost savings for the airline.

The vendor also says that thanks to its compliance with IP 67 and MIL-STD-810C/D/E/F/G, the *PD70X* ensures "outstanding performance" even in harsh environments. It adds that the radio's large colour display and programmable keys make operation more convenient, while a 2000mAh long-life battery means higher efficiency without the need for frequent recharging and also saves on battery replacement costs.

Wireless overcomes network security challenges at Dakar Port

Dubai Port World (DPW) runs 49 terminals in 27 countries, and ranks amongst the world's four largest container terminal operators.

In June 2007, it was awarded the concession to operate and further develop the four existing container terminals at the Port of Dakar in Senegal, with the aim of more than doubling their capacity.

As part of this, DPW decided to improve security coverage across the Dakar Port site in order to enhance the processes for control and access, as well as health and safety. The need for real-time video-surveillance across the site was identified as a priority. This included covering the main access point; improvement here would not only enhance the overall security of goods and services entering the site, but also act as a safety mechanism for employees as this was also the location where they were paid their wages.

Three factors were considered key to the surveillance solution. Firstly, a central video and security control point, manned round the clock, needed to be setup towards the centre of the site.

Secondly, given the nature of the facility where large bulk cargo and containers are regularly moved and reorganised to cope with the differing volumes and types of port traffic, the solution had to be wireless based.

And thirdly, the solution had to offer blanket coverage of the four terminals; this was not only important for theft prevention, but also for health and safety and to ensure that employees operating machinery are aware of any obstacles or others working throughout the site.

But in order to fulfil these objectives, DPW had to factor cost considerations into the system's initial design, as well as overcome a number of technical hurdles. For instance, because the central security control facility needed to be located at the heart of the site, the distance to the nearest video surveillance cameras/wireless points would be less than 30 metres – a challenge for wireless broadband systems.

In addition, the layout of the port (which has four distinct zones which make up the different terminals) meant that a combination of point-to-point/multipoint wireless solutions would be needed.

A third issue was the height and obstruction of the containers: 16 metres was the maximum height for a camera location and this therefore posed a potential problem for the provision of line-of-sight radio links.

And finally, because Dakar Port operates 24/7/365, the solution would need to be of the highest reliability and availability.

DPW approached specialist systems integrator INEXO and its local technology solutions partner in Senegal to come up with the networked wireless video surveillance solution. They designed three distinct point-to-multipoint (PMP) wireless zones, with a 340° coverage of the whole site, all converging on a single mast at the security and surveillance centre at the core of the facility.

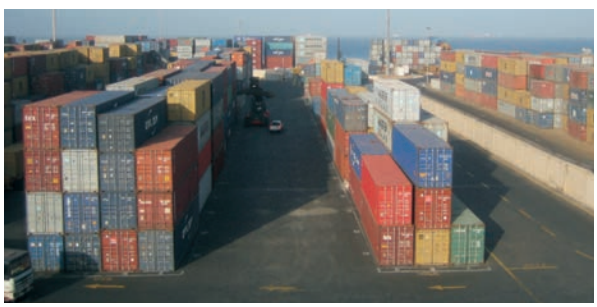
For the wireless transport part of the solution, INEXO chose InfiNet Wireless' *InfiMAN* 2x2 series devices. According to the vendor, this "cost effective" PMP solution offers advanced MIMO technology along with reliability and robustness for deployments in harsh climatic conditions.

INEXO also specified the company's *R5000-S* and *R5000-Sc* to support the majority of the pre-installed camera locations. It's claimed the throughput and distance support of these systems proved more than adequate for video transport, even when line-of-sight paths were partially obstructed.

InfiNet's *R5000-O* and *R5000-Om* were deployed as base-station masters for the site. For the zone immediately adjacent to the security centre where the link length was less than 30 metres, the *R5000-Smc* was used to overcome the short-distance issues that are a common challenge with broadband wireless solutions.

InfiNet says the low latency of its wireless solution also proved a deciding factor for the deployment. Surveillance was based on IP cameras with remote-controlled pan, tilt and zoom. These require low-latency transmission so that they can be quickly manoeuvred into their positions from the control centre.

Overall, the installation and commissioning of the networking part of the solution from start to finish took less than one working week – and within the allocated budget.



Installing a line-of-sight video surveillance system at the Port of Dakar's four container terminals proved challenging as 16 metres was the maximum height available for camera locations.

DriveProfiler's *MHub* device plugs directly into a vehicle's diagnostics port and automatically sends driver-behaviour data to an insurance company. The device uses Telit's *GE865* M2M module

Usage-based insurance "ideal showcase" for M2M

Telit specialises in helping organisations leverage the Internet of Things (IoT) with a portfolio of integrated products that includes platforms, services, and a range of modules that address all cellular communication technologies, GNSS, and short-to-long range wireless applications.

In South Africa, the company's modules have been used in DriveProfiler's *MHub* system to show how M2M technology can help the motor insurance industry.

DriveProfiler is a telematics solution provider and offers a range of hardware and software solutions as well as industry-specific consulting and advisory services. The company is a division of Scope Technologies which was established in 1999 and has a presence in over 60 countries.

Its *MHub* telematics device plugs into a vehicle's on-board diagnostics port and incorporates Scope's patents including the self-calibrating accelerometer, driver behaviour pattern recognition, and advanced accident telemetry data (such as vehicle impact zone, impact angle and magnitude, for example). DriveProfiler says *MHub* was developed for consumer connected car solutions, fleet management and insurance telematics, and it reckons usage-based insurance (UBI) in particular is the "ideal showcase" for M2M.

According to the company, motor insurers have long suffered from very high claim ratios, low profits, and an inability to separate high-risk drivers from low-risk ones. It says an M2M-powered insurance telematics device such as the *MHub* automatically sends driver-behaviour data to an insurance company delivering immense value for the insurer and insured alike.

Once installed, the unit collects vehicle activity trip data, driver behaviour, in-vehicle network data (such as fault codes, fuel consumption, due services, etc.), detects accidents and sends reconstruction data, odometer values, BLE sensor data (such as driver ID, input status, driver's bio feedback, etc.), and manages user defined geofence activities.

DriveProfiler says that one of the topics that typically comes up in discussion with insurance companies investigating insurance telematics is whether a smartphone can be an effective data-collection device. The firm believes that whilst it is tempting to be attracted by the ubiquity of such devices, there are many major drawbacks to using them to collect driver-behaviour data.

For instance, drivers will need to ensure that they have their phones on every journey and not just on the ones where they know they have to 'behave' for insurance purposes. Also, there is no guarantee that the device being used belongs to the driver rather than a passenger. And of course, it has to be charged.

Other questions DriveProfiler raises about using smartphones for insurance telematics rather than a dedicated and installed device include:

- Are the sensors on the phone good enough to ensure accurate data collection?
- How can you ensure drivers are tracked only when they are driving and not at other times?
- Who owns the data collected by the smartphone?
- How safe are the driver-behaviour data on the smartphone – can they be accessed by any other apps that could be unauthorised?

"In summary, the smartphone may at first appear to have some advantages to a motor insurer looking to deploy usage-based insurance," states the firm. "However, only a dedicated telematics device with embedded M2M can really deliver the reliability, accuracy and privacy controls insurers and their customers demand.

"By leveraging over six years of UBI experience with real insurers selling real UBI insurance policies, DriveProfiler's insurance customers can reduce fraud and accurately price their customers' driving behaviour.

No traffic jams with free Wi-Fi on buses

Project Isizwe was co-founded in South Africa by former Mxit and iBurst CEO Alan Knott Craig Jr. The project's coordinators work with local, provincial and national government to provide free Wi-Fi in low-income communities for the purpose of education, economic development and social inclusion. They use low-cost and low-maintenance Wi-Fi equipment, under-utilised fibre that's already in the ground, and semi-skilled technicians and labourers.

Project Isizwe is continuing to deploy its Free WiFi systems in South Africa's Western Cape region, rolling out capacity for 40,000 users around schools in Atlantis and Robertson. But it was first introduced in the city of Tshwane in November 2013 where users can now access the for free via 752 public hotspots. In July 2016, Project Isizwe said it planned to increase these by a further 700 sites across the city.

In Tshwane, the project has enabled a number of value-added services, including free Wi-Fi on board local buses operated by A Re Yeng. Here, RADWIN's *FiberinMotion* systems were chosen to provide the wireless mobile connectivity.

In phase I of the project, the system's high-capacity base stations were deployed along the A Re Yeng route from Pretoria Central to Hatfield. RADWIN's *Vehicular Mobile Units* were installed on board buses with two antennas mounted on the roof and the *FiberinMotion Tool* is used to monitor network performance in real-time.

The company says its base stations provide continuous coverage and broadband connectivity to the buses in motion. The base stations are being used in Diversity mode to deliver up to 100Mbps but can go up to 250Mbps in MIMO mode.

RADWIN says *FiberinMotion* offers long range coverage of up to 10km between base stations, thus reducing infrastructure costs. It adds that "seamless" handover is guaranteed ensuring service continuity even at speeds of up to 250kph.

From December 2014 to June 2015, RADWIN says the free Wi-Fi on board Tshwane's buses attracted 208,402 unique users who were responsible for more than 9.5 million online sessions and a total data usage of 30TB. ■

RADWIN's base stations provide continuous coverage and broadband connectivity to the buses in motion. The stations deliver up to 100Mbps but can go up to 250Mbps in MIMO mode.

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Digital master or back office slave?

Operators need to maintain basic revenue streams while coming up with new digital services. But has this brought them to a tipping point where it is now a must to outsource operations to outside specialists?

As communication service providers connect Africa, do their business models still connect with their operational capabilities? RICHARD ULLENIUS reckons it's time for a re-think.

Wikipedia tells us that Africa is the world's second-largest and second-most populous continent. At about 30.3 million square kilometres, including adjacent islands, it covers six per cent of the Earth's total surface and 20.4 per cent of its total land area.

The continent's massive size alone has presented a connectivity challenge unlike anywhere else in the world. As is well documented, Africa's telecoms service providers are deploying a variety of networks, from satellite to terrestrial, fibre to optical, to reach the population with voice and internet services.

But the intention is to do much more. Delivering new digital services such as video, music, e-health and online education services is important not only to consumers, but to the operators that leverage such services to gain new customers, build revenues and develop competitive advantage.

As a result, Africa has been able to leapfrog technologies and has seen a number of firsts in the telecoms arena. It is home to the first 4.5G network trial (Namibia) and the world's largest Wi-Fi shopping centre deployment (the 130,000m^2 Mall of Africa in Johannesburg).

Angola Cables is building the southern hemisphere's first subsea fibre optic cable system to link Africa and South America, ultimately stretching to Miami and enabling Africa to connect directly to the United States.

Meanwhile, Facebook will use satellite technology to provide high-speed broadband services to Africa as part of its *Internet.org* initiative to connect the world; and the release of so-called digital dividend spectrum presents opportunities to try new wireless technologies such as TV white space which is being trialled in several countries across the region.

While many connectivity initiatives are under way, can service providers also connect all of the moving parts within their own operations to keep both traditional and new, digital services fit for purpose and operating efficiently? Has the need to maintain basic voice, video and data revenue streams – while coming up with innovative ways to connect the population with new digital services – brought operators to a tipping point where it is now a must to outsource their back-office operations to outside specialists?

More 'heavy lifting' needed

Third-party specialists operating in managed services programmes are not new. For decades, managed services providers (MSPs) have done the heavy lifting of managing internal IT operations for a variety of businesses that wanted to save costs or augment in-house teams with additional staff. But in today's digital services era, managed service providers will be called upon to do much more. They will need to align operations not just for digital services, but also across the entire business model to serve the digital consumer.

MSPs can't follow the old-school managed services model of merely replacing technologies. As well as systems performance improvements, the approach to fully transforming an organisation into a digital operation must also consider improvements designed to impact business outcomes.

With the integration of cloud, data warehouses and various data services, MSPs are transitioning away from selling traditional IT and communication services to telecoms customers. They are evolving to offer a full solution strategy to align internal

teams, processes and operating systems to support the digital transformation journey. And today's MSP need to do all this in ways that internal teams often can't or simply don't have the time to do.

A digital transformation is not just an IT transformation. In reality, it is much more, and requires that a service provider's assets – whether human or an operational system – are aligned to support the digital consumer alongside more traditional operations. While IT transformation requires investments in new systems, the focus for digital transformation needs to be centred on investing in new ways of thinking and strategy.

We know this is true from our own experience. But CSG also conducted a survey with Pipeline Market Research to poll communications service providers worldwide about their ability to transform their businesses for digital services using their existing, in-house resources.

The survey results indicated that providers lack confidence that their BSS and in-house teams are able to support the next-generation of digital services. Respondents stated they would add IT infrastructure and process alignment, customer experience management (CEM), and billing and BSS skills to their existing teams to better support future digital services.

Similarly, the service providers surveyed indicated that "strategic transformation of existing business model, teams or skills to support digital services" was their top organisational worry related to digital transformation. The "technology to support new digital services" was the second highest concern, followed by "processes to support new digital services".

The sentiment for using third-party managed service providers to augment internal resources and expertise appeared to be very positive. Almost all those surveyed (97 per cent) said they would find value in an external MSP. The majority (68 per cent) said that they currently rely on third parties, while more than half (56 per cent) are either considering using or increasing the use of third parties in the next 12 months.

Furthermore, the majority of service providers stated that they would recover between 10 and 50 per cent of their existing team's time by using a third party to manage their BSS, and a significant portion (13 per cent) said they would recover more than half of their team's time to focus on innovation.

Multiple vendors, multiple headaches?

Survey results are useful for illustrating sentiments and trends. But can an MSP make a difference when it comes to every day operations?

One of the largest communication service providers in Africa as well as the world, leverages its managed services provider to simplify and streamline its operations and focus its resources on core business lines across wholesale and retail billing.

The operator cannot be named due to confidentiality agreements, but prior to engaging an MSP its wholesale billing architecture was made up of many different software applications. They were each run independently from one another by the different vendors and subcontractors that originally provided or installed the system.

Apart from the inefficiencies this brought about in terms of maintaining and managing these systems, the costs of contracting support services from multiple vendors was escalating at a rate faster than the business was growing. In addition, new government regulatory changes had put tremendous pressure on the operator's profitability.

Looking at business goals holistically led to a new approach designed to consolidate all of these contracts and vendors under a single managed service agreement across wholesale billing. The communication service provider leverages the MSP to manage a variety of complex solutions. These range from billing, routing to ensure the best wholesale rates and deliver the best quality of service, and interconnection for wholesale settlements, to homegrown tools and systems from other third-party provider technologies.

Richard Ullenius, Vice president of managed services, CSG International

The solution consolidates all the external vendors, contractors and employees into one managed service. Because systems and the teams that support them are now streamlined behind a common purpose, the business outcome for the operator has been a much shorter time to market for new products and services.

What to look for in an MSP

When done properly, an MSP can manage complex customer and revenue management processes, proactively translate strategy into a vision for how BSS should evolve, and de-layer current BSS infrastructure to create flexibility and agility. This is clearly a much bigger order than simply aiming for cost reduction and staff augmentation.

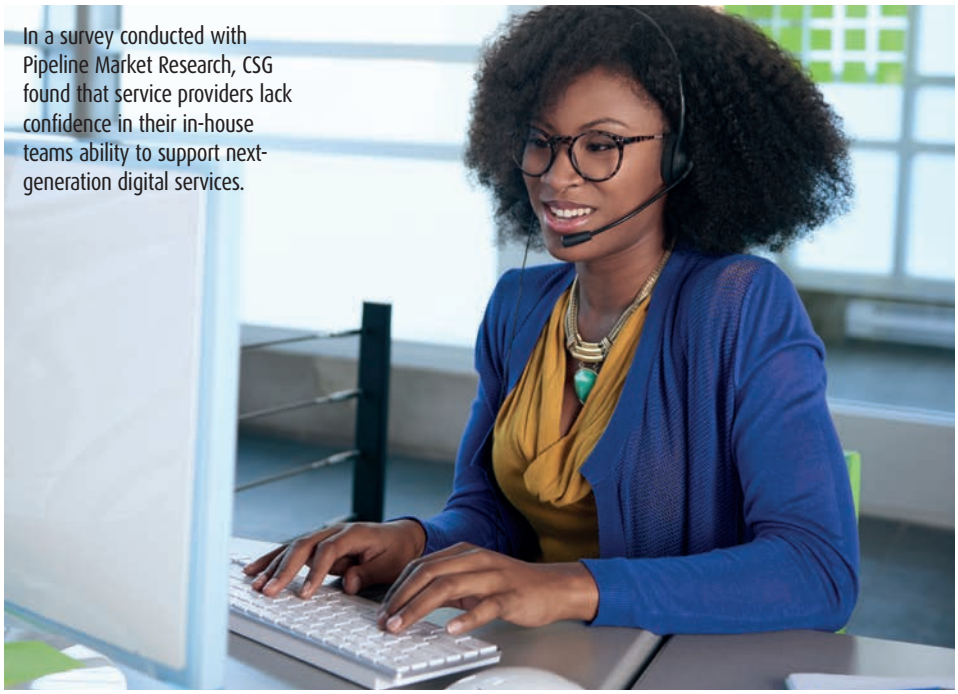
Arguably, to align its business to support current operations alongside the need to innovate to reach new customers with digital services, a telecoms service provider should adopt an approach that prioritises the following:

Increase efficiency and competitiveness: Organisations that try to take care of all IT services in-house can have much higher research, development and implementation time. All of that increases costs and decreases time to market.

Enable fast implementation of new technologies: Developing and implement a new project in-house might involve weeks or months to hire the right people, train them and provide the support they need. MSPs can often provide an appropriate level of resources to start and implement such projects. For most deployments, quality IT companies will bring years of experience and domain expertise, saving time and money for the telco.

Reduce risk: Every business investment carries a certain amount of risk. Markets, competition, government regulations, financial conditions and technologies all change very quickly. MSPs assume and manage much of this risk. Furthermore, they can offer specific industry knowledge, especially security and compliance issues.

The consumer demand for digital services everywhere in the world has caused an era of unprecedented change for the telecoms industry as a whole. This is particularly the case in Africa, where the change to digital is unfolding on networks crossing air, land and sea. Drawing upon the knowledge of the industry at large is the key to building the right connections between people and business operations. ■



In a survey conducted with Pipeline Market Research, CSG found that service providers lack confidence in their in-house teams ability to support next-generation digital services.

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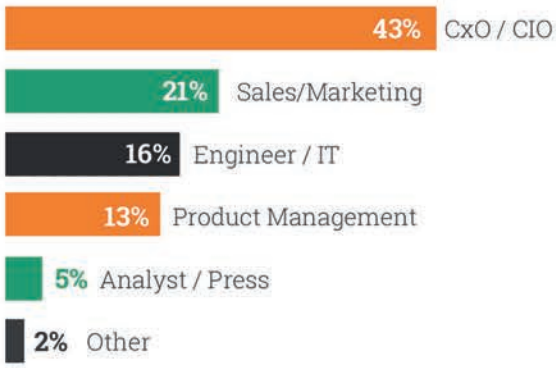

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World's first LoRA-based IoT network goes live in Netherlands

Dutch telco KPN has unveiled the world's first IoT network based on LoRa (long range) WAN technology. It will use the *ThingPark Wireless* platform from French specialist Actility to connect a wide range of objects in markets as diverse as agriculture, smart building, transport infrastructure and healthcare applications.

The two firms have been working closely together since November 2015 and have now installed several hundred LoRa antennas across the country. Around mid-July it was announced that KPN's IoT network had gone live, initially in Rotterdam and The Hague.

Actility says its *ThingPark Wireless* system provides long-range coverage for low-power consumption sensors. The platform offers a variety of features including storage for sensor data, embedded software and cloud solutions to connect devices, and a dedicated online marketplace for IoT sensors, applications, etc.

Earlier this year in June, Actility also announced the launch of *ThingPark* in China. It has partnered with Foxconn Technology Group to offer end-to-end IoT services from sensors and gateways to network management and SaaS. ThingPark China will begin business operations in the third quarter of 2016.

"China is an opportunity like no other IoT market," said Actility CEO Mike Mulica. "It's growing 30 per cent a year, and a third of the world's 15 billion connected things in 2020 will be in China."

Actility CEO Mike Mulica said KPN has "made good" on its ambition to turn The Netherlands into a smart nation.

Satellite use expands in French Polynesia to meet growing broadband demands

The Office des Postes et Telecommunications of French Polynesia (OPT) has signed a new and expanded contract with Intelsat for connectivity on *Intelsat 18*.

State-owned OPT delivers fixed line and postal services to more than 80 inhabited islands covering an area of a five million square kilometres. It has three wholly owned subsidiaries: Vini for mobile, internet services, TV content and network solutions; ISS for software and electronics services and accessories; and Tahiti Nui Telecoms for data centre and hosted infrastructure.

In 2008, OPT commissioned Intelsat to design a Ku-band beam on *Intelsat 18*, which orbits at 180°E, so that it could provide coverage to all of French Polynesia, including the Cook Islands.

Under a recently signed multi-year agreement, OPT will be able to further expand its wireless infrastructure to meet the fast-growing mobile broadband and internet needs of businesses and communities on the more remote islands located in the South Pacific.

OPT president and CEO Jean-François Martin says: "The optimised performance of *Intelsat 18* provides a complement to our terrestrial infrastructure which will enable OPT to further extend its network, increase its business and, more importantly, provide reliable internet connectivity to the citizens of French Polynesia, reducing the digital divide between Tahiti and the remote islands."

OPT says Intelsat's satellite solutions have enabled it to scale its network as the demands for internet and mobile broadband connectivity have continued to rise. Intelsat adds that given the terrain of French Polynesia, satellite is the only way to connect remote islands to the mainland, and help telecoms providers scale their networks to meet growing business demands.

SK rolls out nationwide LPWAN

South Korea Telecom plans to invest more than KRW100bn (around USD84m) over the next two years to boost its IoT business. It will build a nationwide low-power WAN within this year, develop IoT-dedicated modules, and upgrade its IoT platform, *ThingPlug*.

The operator says its plans are in step with the Korean Government's move towards promoting new industries. For instance, the Ministry of Science, ICT and Future Planning has now revised the maximum transmit power for the 900MHz frequency band from 10mW to 200mW to nurture the IoT industry. This will help the country's operators overcome limitations caused by the low transmit power and to secure the basis for many new IoT services.

Along with the nationwide LPWAN, SK Telecom will also establish an IoT control centre to monitor the real-time status of the nationwide network and all connected devices to optimise operation.

Moreover, the operator says it will develop IoT-dedicated modules that can be embedded into appropriate devices. The modules will have open APIs, and to further support startups and SMEs SK Telecom says it will provide them free of charge.

The operator is a member of the LoRa Alliance which promotes the LoRa protocol (LoRaWAN) as a global and open standard for IoT.

Longest rail tunnel safer with Tetrapol

The world's longest railway tunnel, the 57km Gotthard Base Tunnel (GBT) in Switzerland, is using the Polycom radio system which is based on Tetrapol.

Covering Switzerland and Liechtenstein, Polycom is used by public rescue and safety organisations as well as by operators of critical infrastructures. The system's Tetrapol technology is supplied by Airbus Defence and Space (ADS).

The company explains that the system in each of Gotthard's two single-track tunnels consists of two overlapping cells for both tubes. Each cell works independently and is based on nine transceiver stations. Coverage in the tunnel is ensured by a radiating feeder cable that receives the radio signal from two directions. According to ADS, communication would therefore still be possible on both sides even if parts of the system became damaged by fire.

In addition to Tetrapol, Gotthard also has a vast data network connecting 152km of passages, main and access tunnels.

Following an initial construction phase which began 17 years ago, the GBT began operations at the start of June 2016. It connects northern and southern Europe through the Alps, and journey times for passenger trains between Zürich-Lugano-Milan have been cut by about an hour.

As well as being the world's longest rail tunnel, Gotthard is also the deepest – in some places it is separated from the Earth's surface by around two kilometres of rock.

In addition to Tetrapol, the GBT also has a vast data network based on more than 450 Alcatel-Lucent *OmniSwitch 6855* switches. The network connects tunnel lights, racks, power systems, doors, drainage and ventilation systems.

Data gathered by sensors, monitors and surveillance equipment in the GBT's 152km of main and access tunnels, and cross passages are transmitted to two control centres at the tunnel's north and south ends.

Lenovo debuts first *Tango*-enabled smartphone

Lenovo has unveiled the world's first smartphone that uses Google's *Tango* augmented reality (AR) technology.

The *PHAB2 Pro* features sensors and software that map its surroundings to enable various AR experiences. For example, one of the first *Tango*-enabled apps is from home improvement company Lowe. *Vision* enables customers to measure spaces and visualise how appliances, décor, counter tops, tiles, etc., will all look and fit together in a room.

There are three core technologies behind *Tango*: firstly, by using motion tracking the *PHAB2* Pro's 'eye' sees its own location in 3D; secondly, area learning tells the smartphone its location; and thirdly, depth perception enables the device to analyse the shape of the world around it by detecting surfaces and obstacles.

"Now for the first time ever, your smartphone can visualise and understand its surrounding objects and environment via sensors that capture more than 250,000 measurements a second," says Lenovo.

All the data simultaneously received from multiple camera sensors, the gyro and accelerometer are processed and time stamped by Qualcomm's *Snapdragon 652*. Lenovo reckons this results in a fast and smooth augmented reality experience, where 3D AR overlays track more naturally to the physical surroundings.

Other features include LTE connectivity, a 6.4-inch display with QHD (2,560 x 1,440) resolution, six megapixel camera that supports 4K video recording, and Dolby playback and surround sound recording.

The *PHAB2 Pro* uses Google's *Tango* system to create various augmented reality experiences.

TETRA expanding globally but Europe dominates

Europe is expected to remain the world's largest market for TETRA and will continue to rise, according to IHS.

In its latest global report and analysis, the critical communications industry specialist says the global market for the technology is "healthy" with growth expected in all regions.

Eastern Europe in particular is projected to see rapid expansion. Here, IHS forecasts new terminal shipments in the industrial sector to increase by almost 50 per cent, and in transport by nearly 27 per cent. And Western Europe is expected to remain the largest global market for active TETRA radios with a 53 per cent share of the installed base as at the end of 2015.

Phil Kidner, CEO of the TETRA and Critical Communications Association, said: "2015 has been an exceptional year for TETRA in Europe, with the completion of the nationwide networks in Germany and Norway. We are also seeing re-investment in existing TETRA networks, with a huge amount of activity in renewing both infrastructure and terminals."

Although Europe remains the largest market, IHS believes it will be challenged by the end of 2020 as the installed base increases in other regions including Middle East and Africa, and the Americas. The American installed base is forecast to be led by Latin America, although North America is also forecast to grow substantially.

Mission-critical applications continue to make up a major part of the TETRA market, with public safety and security representing more than 56 per cent of the installed base. However, over the next five years, IHS predicts that business-critical applications will see the most growth, including sectors such as utilities and industrial.

Small cell system for data-hungry London

CCS (Cambridge Communication Systems) and Luminet plan to rollout a small cell network across London. The partners say this will provide mobile operators with readily-available wireless backhaul for their small cell deployments, and enable enterprises to receive up to 1Gbps internet access.

According to CCS, although small cells are recognised as the ideal solution for operators to cope with the increase in mobile data, deployment is often hindered by site acquisition and associated planning approvals.

The firm aims to address this through its partnership with managed service provider and ISP Luminet. The latter already has more than 1,900 sites in London via its fixed wireless access infrastructure. It also has two 112MHz frequency channels in perpetuity at 28GHz which will be used by CCS' *Metnet* self-organising wireless backhaul system. Luminet has integrated its 3D mapping and site database into the *Metnet* planning tool in an effort to simplify the design and planning stage of each London small cell deployment.

The 3D map data provided by Luminet will identify demand hotspots in the capital for on-net delivery. It is claimed to be "highly accurate", with a resolution of less than one metre,

CCS says its *Metnet* small cell system has been designed for discreet street installation on lamp posts, walls, rooftops, etc.

allowing for reliable one-by-one or mass predictions without the need for physical site surveys.

The partners say their wireless backhaul network is planned for 23 partitions and 250 polygons across 1,050 small cell sites, enabling a transit capacity of 0.012 GkM (Gbps/km^2/MHz).

SIMs helping to monitor fuel tanks

Sensile Technologies will use 25,000 SIM cards from Orange Business Services (OBS) to monitor more than 60,000 oil and gas tanks across 60 countries.

Previously, the Switzerland-based IoT specialist used 2G compatible devices to power its telemetry solutions: *GASLink* and *NETRIS 2*. In a three-year deal, OBS will support the two systems worldwide, extending their coverage to include 3G/4G devices.

GASLink and *NETRIS 2* are installed directly in an oil or propane tank and regularly send level measurements via GSM to Sensile's *Oil Link* cloud. Merchants and their hauliers receive the data directly in their ERP systems to trigger deliveries automatically.

As well as using 2G (SMS) to transmit data, the *NETRIS 2* remote tank monitoring system can also use 3G and 4G, as well as create a short-distance RF connection.

Thanks to the optimisation of deliveries based on live data, OBS says they can lower their logistics costs by at least 25 per cent, without the risk of customers running dry. In addition, customers can access the *Oil Link* web portal on smartphones to monitor consumption.

According to estimates by Berg Insight, global M2M SIM shipments increased by 19.4 per cent in 2015 to reach a new record of 96 million. East Asia, North America and Western Europe were the main markets in 2015, accounting for around 75 per cent of the total demand.

The analyst believes the latest 3GPP standards for LTE will contribute "substantially" to growth in the next coming five years. It predicts that M2M device shipments will increase at a CAGR of 21.7 per cent to reach 256 million by 2020.

ZTE claims new record for 800G long-haul network

ZTE reckons it's set a new transmission record for a single-carrier 800G long-haul network. In a demonstration carried out earlier this year in China, the company said it successfully transmitted 120Gbaud WDM 16QAM signals over 1,200km terrestrial fibre links. It's claimed this is the highest symbol rate reported so far for 16QAM signals based on ETDM (electrical time division multiplexing).

In the demo, ZTE used 12 x 150GHz WDM channels. Each was loaded with 960Gbps (800Gbps data signals and 20 per cent FEC emulated overhead bits) over a 1,200km link based on 100km spans of *TeraWave* optical fibre.

ZTE said the achieved data rate interface ensured spectral efficiency of 5.33b/s/Hz. It added that both the transmitter-side, and the optical pre-emphasis and receiver-side MLSE (maximum likelihood sequence estimation) were utilised to mitigate the narrow filtering effect caused by bandwidth limitation of the opto-electronic components.

"Thanks to the high baud rate signals generation, transport interfaces with bit-rates of up to 1Tbps will be achieved in the near future," said Dr. Jianjun Yu, chief scientist at ZTE US Optical Lab. "We can expect that bit rates beyond 1Tbps, such as 1.6Tbps, will be introduced as Ethernet standard rates since it would be a logical upward path rate from the 400Gb Ethernet interface, which is based on high baud rate signals and high order modulation formats."

Over the last few years, ZTE has carried out extensive R&D on single carrier transmissions. For example in 2013, it completed data signalling at speeds of 400Gbps over a distance of more than 5,000km. In 2015, the company collaborated with OFS America to realise a 400Gbps single-carrier PDM-QPSK signal transmission over 10,000km. This was said to be a world record for 400G transmission.

True deploys 4T4R

True Corporation has deployed what's claimed to be the world's largest 4T4R (four transmission four receiver) commercial network. The Thai operator's rollout is currently ongoing, and as at June 2016 it had implemented more than 6,300 sites. It is using Huawei's SingleRAN 4T4R solution to usher in 4.5G. The vendor says that compared to traditional 2T2R networks, the downlink throughput of 4T4R at the cell edge with commercial devices has increased by more than 38 per cent, while uplink throughput has increased by 50 per cent.

Telenor sole 4G bidder

The Pakistan Telecommunication Authority (PTA) only received a single bid in its recent spectrum auction for next-generation mobile services. The authority was hoping to attract international as well as domestic operators. It said that in accordance with the timelines of the auction process, it held an information session with possible bidders in May. Telenor was the only firm to submit a bid by the deadline which expired on 1 June. It will pay USD395m for a 10MHz block of 850MHz, and joins China Mobile's subsidiary Zong as the only licensed 4G network provider in Pakistan.

Arqiva in-flight Wi-Fi

Comms infrastructure specialist Arqiva has been selected by Panasonic Avionics Corporation to provide its hosting, connectivity and teleport uplink services via Telesat's new high throughput satellite, *Telstar 12 VANTAGE*. The multi-year deal will see Arqiva deliver a range of mobility services for Panasonic, including inflight WiFi, which will operate round the clock from its Chalfont Grove teleport site near London. Signals are extended to the Panasonic Network over Arqiva's 2.5Tbps core transmission network.

Vodacom drops *M-Pesa* in South Africa

Vodacom will discontinue its *M-Pesa* mobile money services in South Africa with effect from 30 June 2016.

The company said the decision follows a "thorough review" and the fact that the business sustainability of *M-Pesa* is predicated on achieving a critical mass of users.

"Based on our revised projections and high levels of financial inclusion in South Africa there is little prospect of the *M-Pesa* product achieving this in its current format in the mid-term," said Vodafone CEO Shameel Joosub.

Vodacom CEO Shameel Joosub said there was "little prospect" of *M-Pesa* gaining critical mass in South Africa.

With regard to customers, Joosub said: "Vodacom is fully committed to mitigating any inconvenience to customers impacted by the decision and assures all *M-Pesa* South Africa customers that their funds remain safe and readily accessible. We remain of the opinion that opportunities exist in the financial services environment and we will continue to explore these."

Vodacom pointed out that the decision in South Africa does not affect *M-Pesa* customers in Tanzania, Lesotho, Mozambique and the DRC.

It said that in other markets where financial inclusion is limited and where there is a more supportive macro environment, *M-Pesa* "continues to gain solid traction based on exponential growth in customer acquisition".

Cloud-based platform helps connect cars

Car manufacturers can now offer owners cloud-based embedded software maintenance and the latest capability upgrades over their vehicle's entire lifecycle, thanks to a partnership between the Movimento Group and Sierra Wireless.

US-based Movimento specialises in technologies such as vehicle re-flash services and innovations in over-the-air (OTA) software to help realise what it describes as the "Software-Defined Car". The firm's customers in the automotive industry include Ford, GM and Volvo, amongst others.

Under the new partnership, Movimento will integrate its OTA technology with Sierra Wireless' device-to-cloud solution to provide what's claimed to be the industry's first commercially available cloud-based platform to maintain connected cars.

All vehicles have numerous software programs running on a network of electronic control units (ECUs) that need to be individually managed and maintained. Sierra and Movimento say their solution enables automotive OEMs to update software for all ECUs simultaneously over-the-air.

Movimento's software update client runs on the *Legato* Linux embedded application framework available on Sierra's 4G automotive modules. Using the vendor's *AirVantage* cloud platform, it's claimed carmakers can "seamlessly" upgrade all vehicle software by simply logging into the dashboard over a secure network and selecting the appropriate update campaign.

CTO Mahbubul Alam says Movimento has created a centralised solution from car to cloud.

"Rather than worrying about maintaining all the different software and firmware versions, we created a centralised solution from car to cloud," said Mahbubul Alam, CTO/CMO, Movimento. "You don't have to provision every ECU with a dedicated software agent, which reduces CPU and memory requirements, along with overall costs."

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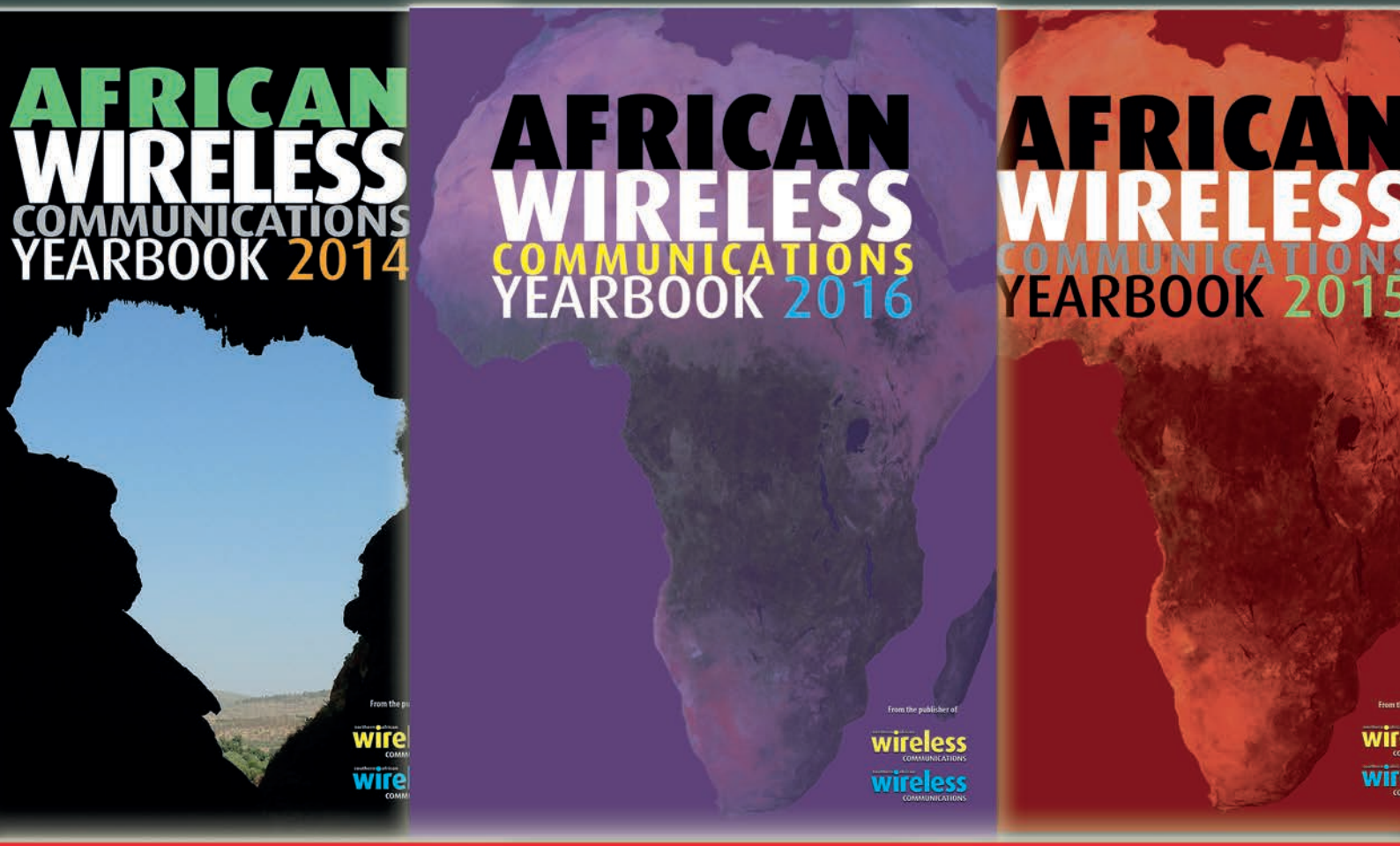

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