

southern african

# wireless

For communications professionals in southern Africa

COMMUNICATIONS

MARCH/APRIL 2015

Volume 19

Number 6

- Why critical communications need open architecture
- How cell site security can improve O&M
- Latest power solutions for operators



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**Turn to page 25**  
**to find out more about Avanti**



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### EDITORIAL:

Editorial director:	Rahiel Nasir
Designer:	Alan McClenaghan
Staff writer:	Abdul Montaqim
Contributors:	
Allan Detlefsen, Graham Friend, Wale Odeyemi, Michael Sothan	

### Editorial enquiries:

Tel: +44 (0) 1932 886537  
 Fax: +44 (0) 1932 886539  
[rahieln@kadiumpublishing.com](mailto:rahieln@kadiumpublishing.com)

### ADVERTISEMENT SALES:

Sales apprentice: Laura Cooley  
[laurac@kadiumpublishing.com](mailto:laurac@kadiumpublishing.com)

### Production & circulation:

Production: Suzanne Thomas  
[suzannet@kadiumpublishing.com](mailto:suzannet@kadiumpublishing.com)  
 Tel: +44 (0) 1932 886537  
 Fax: +44 (0) 1932 886539

Publishing director: Kathy Moynihan  
 +44 (0) 1932 886537

**South African office:** Kadium Publishing Pty Limited, Unit 2, GSW Building, Techno Park, Gold Street, Northgate East, 7405, South Africa

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# Services and connectivity boosted in Tanzania via satcoms and LTE

Tanzania's telecoms sector has seen a great deal of activity in recent weeks with various communication providers launching new services throughout the country.

In late March, UK-based satellite operator Avanti Communications announced it will help deliver a major ICT and e-learning programme to teachers across the country.

The *iKnowledge* programme will equip up to 250 schools in rural and under-served areas with ICT infrastructure. This includes broadband internet via satellite alongside provision of ICT training and educational content for teachers to apply straight to the classroom.

The year-long programme will use Ka-band capacity from Avanti's *HYLAS-2* satellite. Delivery will be supported locally by education NGO Camara Education Tanzania and service provider Infinity Africa Network.

Avanti was awarded the contract for *iKnowledge* under the UK Space Agency's International Partnership Space Programme. This aims to open up opportunities for the UK space sector to share its expertise in real world satellite technology and services with other countries.

Also in March, Africa Online said it planned to expand its VSAT services in Tanzania. The company has rolled out a 'free equipment' promotion in an effort to drive customer uptake and bring VSAT services within the reach of more users. It operates licensed terrestrial wireless networks as well



Avanti has been working with schools such as the Buguruni School for Deaf Children in Tanzania where it helped deliver broadband last year. The company is currently deploying the *iKnowledge* programme to 250 rural schools across the country.

as VSATs in Dar es Salaam, and believes there is "tremendous" growth potential in East African territories such as Tanzania, Kenya and Uganda.

AfricaOnline is a subsidiary of African ISP Gondwana International Networks (GIN) which also owns the iWayAfrica brand.

Winston Smith, general manager of terrestrial services for GIN and Africa Online, said: "VSAT offers easy to deploy connectivity solutions, which compete very favourably with other terrestrial offerings like DSL and fibre."

"The extensive reach and coverage of multiple satellites operated by GIN provides connectivity in both metropolitan and rural markets across the extent of Tanzania."

## Tigo launches LTE

On 22 April, Tigo Tanzania went live with its LTE network. Services are now available in the Masaki and Mlimani districts of Dar es Salaam, but by August coverage will extend across the entire city as well as the regional capitals of Arusha, Moshi, Dodoma, Morogoro, Mwanza and Tanga. Tigo claims this will make it the country's biggest 4G network.

The operator plans to invest USD120m on expanding and upgrading its network during 2015. This includes scaling up its 3G sites and national fibre network to offer services to more users.

Tanzania's mobile market is said to be over-crowded and currently

has seven mobile operators. As well as Tigo, which is owned by Luxembourg-based telco Millicom, it also includes Airtel, Smart, TTCL, Vodacom and Etisalat's Zantel. Smile is the only other operator to offer 4G services in the country, although this mainly covers the capital city area as well as Arusha, Dodoma and Mwanza.

In a separate announcement made earlier this year, Millicom said customers of its *Tigo Pesa* mobile money service in Tanzania will be the first in Africa to be able to transact with users of all their country's mobile money networks, following an agreement with Vodacom's *M-PESA* service.

Since last year, *Tigo Pesa*'s four million customers have already been able to exchange money with Airtel's and Zantel's mobile money subscribers (*News*, May-Jun 2014). Over the coming months, they will now also benefit from 'interoperability' with six million *M-PESA* users in Tanzania.

"With *Tigo Pesa*, customers will now have Africa's first universal mobile money exchange system," said Millicom EVP Arthur Bastings. "They will be able to safely and securely transact with millions more people across the country. We hope many more Tanzanians will choose mobile money so that everyone benefits and we can extend financial inclusion even further."

*Avanti in pan-African aviation project – p8.*

## Telecom Namibia legacy CDMA network switched off

Telecom Namibia (TN) has discontinued both its *Switch* voice and 3G-EvDO data services on its legacy CDMA network. It said all CDMA sites were shut down on 31 March 2015 as it has transitioned most customers off the technology and onto TN Mobile's faster HSPA+/LTE networks.

"The entire CDMA footprint is already covered with GSM which we began building in 2013," said an announcement on the operator's website. "Customers who are still

using their CDMA services are kindly advised to swap their CDMA numbers with a GSM SIM card of TN Mobile."

TN said the main reason for the shut down was to avoid operating two mobile networks and offer services over a single GSM platform. The move also enables it to re-use the spectrum as needed.

The operator added that CDMA is no longer able to "favourably compete" with GSM-based 3G and 4G LTE technologies. "CDMA is fast becoming obsolete around the

world and the maintenance of the same will not be a simple affair for any telco in the mid and long term," stated the company. "This switchover from CDMA will allow us to focus our strategic effort on the advancement of GSM technology in the market, with the long term view of ensuring viability and further improving the quality of service to our customers."

TN will replace all EvDO devices with new 3G and/or LTE compatible dongles. To accommodate the needs of all current *Switch* and/or EvDO

users, it said it offers a wide range of different pre-paid and post-paid mobile voice and internet packages to choose from.

CDMA (code division multiple access) was conceived as a cellphone technology in 1988 by Qualcomm in the US and it is still mainly used there. As of April 2014, around 76 operators in Africa and the Middle East were still using CDMA-based technologies (such as cdmaOne and CDMA2000 1x &EV-DO), according to the CDMA Development Group.

# Zimbabwe cancels Telecel's license

Telecel Zimbabwe has had its license cancelled by the government which alleges that the operator has failed to pay its fees and is flouting the country's black ownership laws.

ICT minister Supa Mandiwanzira said a cabinet committee, chaired by indigenisation and economic empowerment minister Christopher Mushohwe, has been appointed to wind down Telecel's operations. The situation of the firm's employees and 2.5 million subscribers would be "carefully considered", he said.

While the decision was effective as from 28 April, reports say Telecel

was granted a 30-day license to give customers time to switch providers

Telecel is a subsidiary of Russian telco VimpelCom. Foreign ownership of Zimbabwean companies is limited to 49 per cent by law, but Telecel's local operation was estimated to have only 40 per cent local ownership.

Earlier this year in January, the Postal and Telecommunications Regulatory Authority of Zimbabwe (POTRAZ) warned the company that its operations would be closed down if it did not rectify the situation. The regulator believes Telecel has failed to do so.



The fate of Telecel Zimbabwe is apparently sealed, but staff at the company's headquarters will be treated with consideration, says the government.

Telecel will challenge POTRAZ's decision. In an online statement, it

said: "This measure is unfair and unwarranted. Telecel has made every effort to comply with all legal and governmental requirements in Zimbabwe, and objects to this treatment in the strongest terms."

"Telecel and its global shareholders are taking immediate action both locally and internationally to challenge this decision."

The operator added it will take all possible steps to maintain the full range of its services throughout this process, and said the welfare of its customers and partners was of the "utmost importance and priority".

## Access launches LTE in Malawi in 'record time'

Access Communications has implemented the first LTE network in Malawi. It worked with Italy-based Athonet on the deployment which is claimed to have been completed in record time.

Athonet said it was able to implement LTE for the operator in a matter of weeks using *PriMo*, its software-based mobile network infrastructure solution. The firm said this virtualises and increases performance of the mobile core, and can run on

standard IT servers or in the cloud. It integrated this distributed virtual EPC with Access' existing infrastructure, including its CDMA network. Athonet said the fully virtualised software approach has created an ultra-broadband LTE service with guaranteed low latency and high reliability.

The company's head of operations Massimiliano Gianesin said: "Our software approach to infrastructure means that mobile networks in developing countries can be deployed

very rapidly and cost-effectively both in terms of capex and opex, avoiding the complexity of legacy products and simplifying operations."

Access' network covers Blantyre's business district with initial services aimed at clients who require high-speed internet access and voice services. The operator plans to launch more services and expand the network across larger areas of Malawi.

"Provision of cost-effective scalable data and voice services by the

telecommunications sector is directly linked to increased GDP," said Access CEO Faizal Okhai. "The introduction of 4G LTE services in Malawi will serve a latent demand for high quality ultra-broadband internet for corporate and individual consumers."

Access became Malawi's second national operator when it was awarded a license in 2007 and launched its service three years later. Telekom Networks Malawi was the first, having been established in 1995.

## Botswana telemedicine network uses TVWS spectrum

The Botswana Innovation Hub (BIH) has launched a pilot telemedicine project using TV white spaces (TVWS). *Project Kqolagano* will provide internet connectivity and services to hospitals and clinics, enabling access to specialised medicine in Gaborone and other locations around the world.

BIH worked in collaboration with a number of organisations on the deployment, including the Botswana-UPenn Partnership (BUP) between the Government of Botswana, the University of Botswana, and the University of Pennsylvania.

Dr Geoffrey Seleka, BIH director of marketing, ICT and registration, said: "Through *Project Kqolagano*, we will be using TVWS technology to provide access to specialised telemedicine applications, where hospitals can send high-resolution patient photographs back to Gaborone and Philadelphia for a more accurate diagnosis and care."



The project was officially launched at the Tsopeng clinic in Lobatse where Adaptrum's TVWS radios (inset) have been installed.

Seleka said there is currently a lack of specialised care in remote hospitals and clinics in Botswana. *Project Kqolagano*, which means 'connection' in Tswana, will have a specific focus on providing access to specialised maternal medicine in order to improve the livelihoods of women located in small towns and rural areas. Telemedicine experts and

doctors providing medical expertise for referred patients are being provided by BUP.

The project will initially run in three locations: Francistown, Maunwas and Lobatse where it was officially launched in March at the Tsopeng clinic. More hospitals and clinics will be added across the country during the coming months.

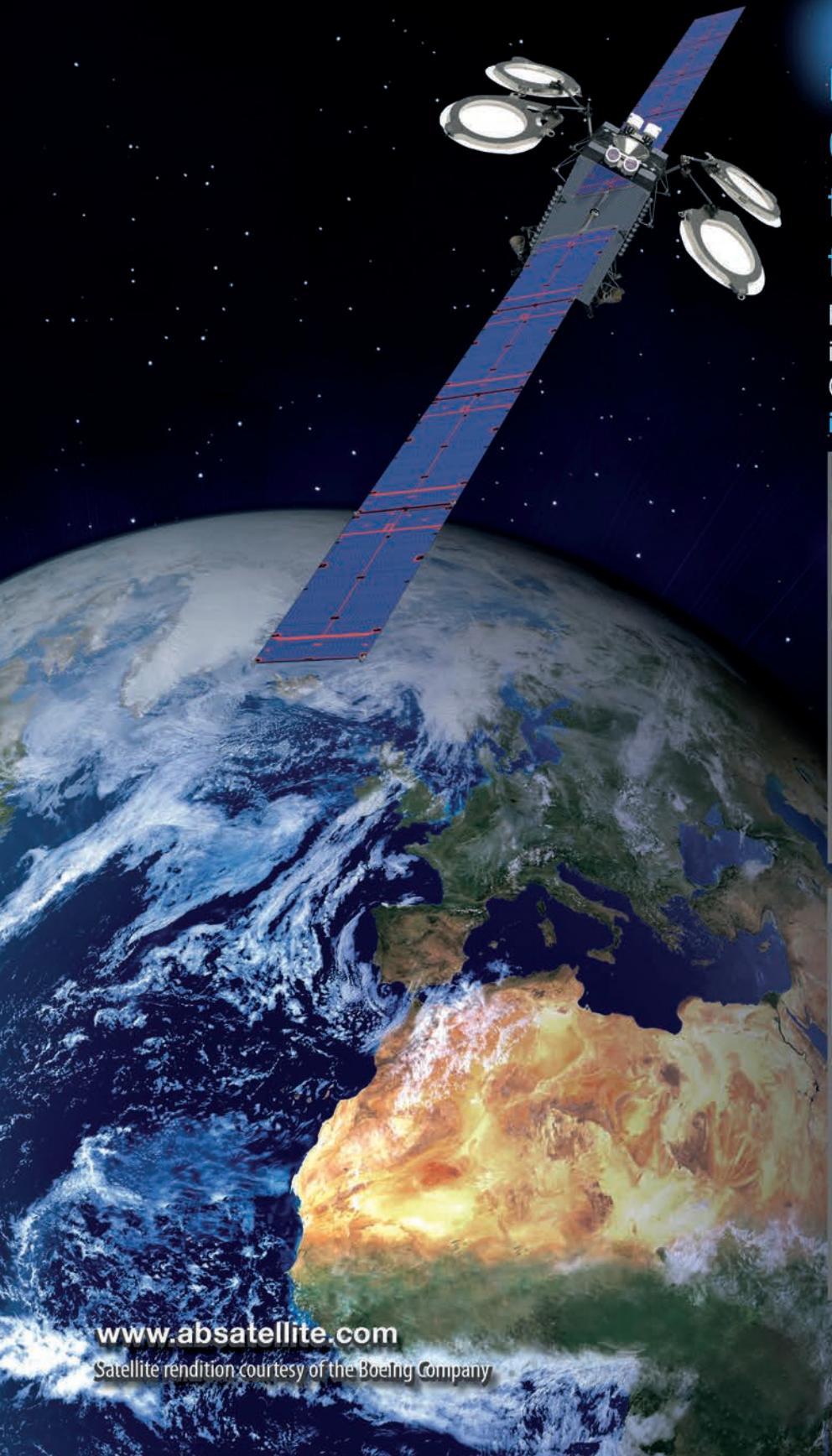
The *Kqolagano* initiative was made possible under an authorisation from the Botswana Communications Regulatory Authority to transmit using TVWS. It is also operating with the support of the Ministries of Health and Infrastructure, Science and Technology.

BIH's other partners include Microsoft which, through its *4Afrika* initiative, has been working on a number of TVWS projects in Africa such as *Citizen Connect* in Namibia (*News*, Sep-Oct 2014). The company says TVWS technology can "significantly improve" the economics of deploying wireless broadband in under-served communities, and also offers the benefit of operating off-grid by leveraging solar power.

The hub also worked with Global Broadband Solutions, Vista Life Sciences, BoFiNet, USAID-NetHope, and Adaptrum which supplied the TVWS radio equipment.



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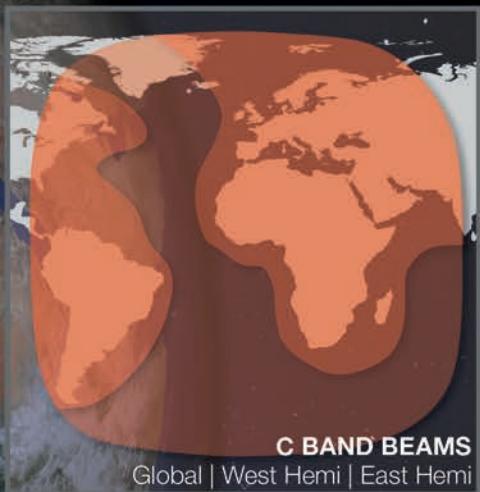
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Satellite rendition courtesy of the Boeing Company

## Money services connected



MTN and Vodafone have agreed to interconnect their mobile money services. The operators say their collaboration will enable "convenient and affordable" international remittances between Vodacom's *M-PESA* users in DRC, Kenya, Mozambique and Tanzania, and *MTN Mobile Money* customers in Rwanda, Uganda and Zambia. Under the terms of an MoU, MTN Group and Vodafone Group will also share best practice and work together to define the rules and standards of mobile-based remittances in Africa.

## IVR updated for Cell C



South African mobile operator Cell C will use Tecnotree's *Reachability Express* to expand its call completion and interactive voice response platform. The vendor claims the new system will reduce Cell C's opex by 30 per cent when compared to legacy systems, mainly through simpler configuration and provisioning of segmented services. In addition to standard notification channels such as SMS and email, *Reachability Express* also incorporates a social media API that is pre-integrated with *WhatsApp*.

## Express-AM6 now live



The Russian Satellite Communications Company's *Express-AM6* is now ready for service. On 22 April, the company said it had commissioned its new heavy-class communications and broadcasting satellite to bring coverage over Russia, Europe, the Middle East, Africa, and Asia. It was launched to 53°E last October, and has a payload of 72 transponders in C-, Ku-, Ka- and L-bands. RSCC now has 11 satellites in its fleet, and also plans to launch two more later this year. *Express-AM7* and *Express-AM8* will both offer C- and Ku-band beams for Africa.

# Cyan and XLink support M2M for SA utilities

XLink Communications will distribute Cyan's M2M solutions in South Africa. The Johannesburg-based firm will offer Cyan's smart energy communication technology which enables the measurement and control of energy consumption for the metering and lighting markets.

The deal also includes an initial order for *CyLec*, Cyan's smart metering hardware and software. A hundred units will be used as part of a proof of concept project for an unnamed "leading" provider of energy management systems in South Africa.

In addition, XLink will provide field-based system integration and technical support for the deployment

of Cyan's technology across South Africa.

The company claims to manage M2M solutions for more than 68,000 businesses in Africa, facilitating 35 million connections each month. Its CCO Hymie Marnewick says demand for smart energy solutions at the right price point is growing in South Africa.

He adds: "Cyan's solutions will provide energy companies with the technology to support demand management, as well as enabling



Demand for smart energy solutions are growing in South Africa, according to XLink Communications.

consumers to manage their energy consumption effectively."

UK-based Cyan describes *CyLec* as a complete control and communication network that uses wireless technology in the ISM band to manage smart electricity meters. The firm has also developed *CyNet*, a wireless mesh networking platform that offers 'last mile' connectivity for M2M communications.

## CommProve to monitor networks

CommProve is working with an African telecoms regulator to monitor the QoS of multiple mobile network operators. The Ireland-based firm, which specialises in end-to-end network management, says it is unable to name the regulator or the country where it's from.

The regulator has deployed CommProve's *GSP* monitoring

solution at sites run by each of the operators. It provides KPIs for every cellco, based on the experiences of every subscriber across each network and round the clock. The information gathered is fed back to a centralised reporting system, and is based on the actual calls or data sessions that subscribers make, or try to make in the case of service failures.

CommProve says MNOs could also benefit from data about their own networks. For example, they could use it to fault find and improve network performance, thereby improving the QoS they provide to their subscribers and attract new customers.

The regulator is planning to make the network performance information available on its website.

## Satellite-based system aids navigation

Avanti Communications will support a satellite-based augmentation system (SBAS) as part of a crucial air navigation project in Africa.

*SBAS-AFRICA* will be used for GNSS (global navigation satellite system) operations serving significant parts of the continent. It is being developed in partnership with a number of local stakeholders such as the South African Air Traffic and Navigation Services Company, South African Space Agency, Ghana Council for Scientific and Industrial Research, the Agency for Aerial Navigation Safety in Africa and Madagascar, amongst others.

The project will use the L1 transponder on Avanti's *Artemis* satellite to provide a navigation data broadcast service. *Artemis* was previously owned by the European



*Artemis* orbits at 21.5°E and features Ka-, S- and L-band transponders.

Space Agency before it was taken over by Avanti early last year. It orbits at 21.5°E covering Europe, Africa and the Middle East with a payload of Ka-, S- and L-band transponders.

According to the Flight Safety Foundation, although around 67 million people fly each year on 762,000 flights that connect to Africa's 371 commercial

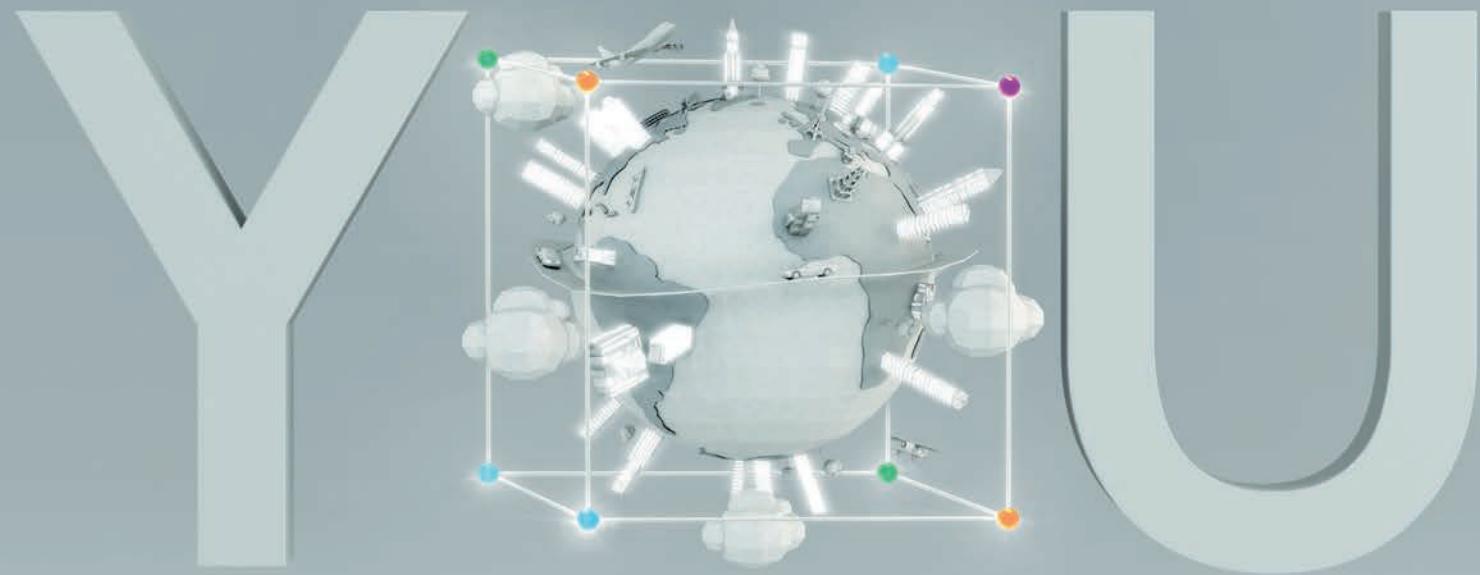
airports, the continent has just three per cent of global air traffic. However, air accidents in Africa account for roughly 20 per cent of the global total.

By demonstrating potential improvements in flight safety via SBAS technologies, the project is also expected to provide socio-economic benefits

According to one EU-backed study, the potential economic benefit to African aviation from the deployment of SBAS services amounted to EUR1.7bn, achievable through the reduction of 'Controlled Flight into Terrain' occurrences, improvement of ADS-B (automatic dependent surveillance – broadcast) technology, and phasing out of traditional navigational aids.

As with the *iKnowledge* project in Tanzania (see p5), Avanti was awarded the contract for *SBAS-AFRICA* by the UK Space Agency.

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## ON THE NETWORK

### Cloud services approach tipping point in Africa

Faster connection speeds, lower data costs, and increased activity by international businesses are creating a perfect storm that is set to see cloud services take off in Africa.

From my extensive consultations with companies across the continent, it is apparent that most enterprises are showing great enthusiasm about the potential for cloud, but many are looking to service providers for guidance on how to embark on this journey.

Until recently, adoption of true cloud across the continent has been hampered by concerns around quality of service achievable across the connectivity, a lack of understanding around cost, availability of bandwidth, security, and data privacy.

However, with high-speed data networks rapidly being rolled out across Africa, prices dropping, and awareness growing around the benefits of cloud, there is an upsurge in interest in cloud computing. This is being driven by multinationals expanding across the region, as well as local financial service institutions and healthcare practitioners, with many small- and medium-sized enterprises now also moving directly to cloud at start-up phase.

The benefits of adopting cloud outweigh the obstacles. Improved connectivity, reduction in IT costs and the retention of key skills are just some of the benefits.

Most CIOs spend their time managing complex IT delivery. But by adopting cloud technology, they have reduced their total cost of operation and increased productivity. Cloud technology transforms the way they do business.

While security and regulatory compliance may be seen as an inhibiting factor in cloud adoption, in reality moving to the cloud can actually enhance security and compliance.



# Third Inmarsat satellite arrives at launch site

Inmarsat's *I-5 F3* satellite has arrived at the Baikonur Cosmodrome in Kazakhstan, ready for launch later in May. This will be the third satellite from the company that will support its much anticipated *Global Xpress (GX)* service.

Inmarsat is investing USD1.6bn in the development and delivery of *GX* which it describes as the world's first globally available mobile broadband service. It has been designed to deliver broadband speeds up to 100 times faster than the firm's *I-4* constellation.

Inmarsat's first *GX* satellite, *I-5 F1*, was launched in December 2013 and entered regional commercial service in July 2014, covering Africa, the Middle East, Asia and Europe. *I-5 F2* was



*Inmarsat-5 F3* is off-loaded from an Antonov AN-124 heavy transporter plane at the Baikonur Cosmodrome, Kazakhstan.

launched at the start of February 2015 and will provide *GX* services over the Americas and the Atlantic Ocean.

When combined with *I-5 F1* and *I-5 F2*, Inmarsat says *I-5 F3* will enable it

to offer "seamless" global coverage. CTO Michele Franci says the project represents a major commitment for his firm: "Its successful completion and the start of global commercial services later this year will bring to life the prospect of the 'Internet of Everywhere'. For the first time, we will be able to deliver seamless, superfast broadband communications across the globe – on land, sea and in the air – from one single operator."

Each satellite in the initial *GX* fleet has 89 beams and six steerable high-power spot beams for multi-regional coverage. Inmarsat adds that the new *GX* network will complement its existing fleet of L-band satellites.

## Vodacom grows its support for farmers

Vodacom continues to support farmers in Africa with yet another new mobile-based service.

The operator's subsidiary in Tanzania has launched *Kilimo Klub*, an exclusive service targeting smallholder farmers. Vodacom said the initiative aims to assist users by giving them vital information services such as credit and market prices, as well as linking them to the wider agricultural community in the country

via their phones. By using *Kilimo Klub*, farmers can also access *M-PESA* services such as *M-Pawa* which enables them to save money, earn interest and apply for micro-loans.

Vodacom Tanzania MD Rene Meza said: "We believe it will allow a lot more farmers to be visible in the economic arena through the gradual elimination of, in some instances, middlemen who do not have the interests of the farmers at heart."

The Tanzanian government has commended Vodafone for this latest initiative, saying smallholder farms need more support.

*Kilimo Klub* is the result of a partnership between Vodacom Tanzania, Olam International, the Connected Farmers Alliance, and Technoserve. In 2014, Vodafone Group also worked with these organisations and USAID to create a "mobile-enabled" supply chain for farmers (*News, Nov-Dec 2014*).

## Botswana launches cybersecurity project

Botswana has launched a cybersecurity project that it says will help it make the most of open access to the internet without the fear of being targeted by hi-tech criminals.

Speaking at the CTO's *Commonwealth Cybersecurity Forum* held recently in London, Botswana's minister of transport and communications Tshenolo Mabeo said the project is important to "guard the safety, security and resilience of cyberspace, so that we can enjoy its socio-economic benefits".

He added that his country needs help against cyber criminals, and welcomed an offer of cooperation from the UK to assist with the development of the national cybersecurity strategy.

"As developing countries we are battling with these challenges, where



Minister Tshenolo Mabeo (right) said Botswana is introducing laws which will help combat cybercrime. Also pictured is CTO secretary general, Tim Unwin.

people are committing crimes in social media platforms under the pretext that their identities are unknown.

"We have seen how the internet has been used as a platform for crimes, abuse, defamation, and to show extreme hate of different forms. These acts are very disturbing and causing a

dilemma on how the legal fraternity can intervene for remedial action."

Botswana's government is currently in the process of implementing the Electronic and Transactions Act and the Electronic Evidence Act in order to facilitate e-commerce. According to the minister, the principles of an open access and non-discriminatory internet should allow communities to freely communicate and reach out to global markets without any fear.

Earlier this year in March, Huawei said it would work with the country's government on protecting against cyber threats. The firm's MD, Gao Wenli, told delegates at the *Botswana Cyber Security and Internet Summit* in Gaborone that cybersecurity is one of Huawei's core strategies.

# Fastest broadband speeds in Africa

CEC Liquid Telecom claims it is now offering the fastest broadband speeds currently available in Africa with the launch of its new fibre-to-the-home (FTTH) service in Zambia.

Earlier this year, Liquid announced plans to build new fibre links in Zambia under a joint venture with power transmission and distribution company, Copperbelt Energy Corporation (*News, Jan-Feb 2015*). Since then, the two have launched *Fibroniks*, their new FTTH service that is claimed to deliver superfast speeds of up to 100Mbps.

The service has been initially launched for around 8,000 homes and businesses in Lusaka including the areas of Rhodes Park, Northmead, Long Acres, Sunningdale and Kabulonga. CEC Liquid Telecom plans to invest around USD15m in the FTTH rollout

## SEACOM network is upgraded

SEACOM has completed an upgrade to its global IP and MPLS network. The firm claims it will offer "substantial advantages" to carriers and businesses looking to expand their communications infrastructure on carrier-class Ethernet, IP and MPLS platforms between Africa, and the rest of the world.

According to SEACOM, the upgraded backbone gives service providers and operators access to gigabit ports offering up to 100GbE at "affordable" prices, as well as the ability to dynamically turn up bandwidth on demand. In addition, the new network will extend the availability of native IPv6 services to all users, and provide translated IPv6-to-IPv4 services.

"The deployment of our new service platform will enable SEACOM to provide a wider range of Ethernet-driven products and services," said Mark Tinka, head of engineering.

"It will also offer us improved levels of operational efficiency and scalability, ease of administration, and provide a growth path for the future. We will easily be able to scale our IP/MPLS network up to multiple terabits of capacity and more, giving us plenty of headroom for growth."

which is expected to reach 20,000 premises in Lusaka by the end of 2015, as well as other towns.

By April, the network had expanded to Victoria Falls. CEC Liquid said it had already laid fibre rings around the town to provide multiple routes of redundancy. By the middle of the month it started to lay fibre to homes and businesses, making broadband access

with unlimited data available to a population of around 35,000 people.

The company says that up until now, broadband services in Victoria Falls had mostly been via ADSL, WiMAX and cellular services such as CDMA and 3G/EDGE, offering speeds of no more than 512kbps.

"This is a major milestone in the development of Zambia's telecoms infrastructure," said CEC Liquid

MD Andrew Kapula. "We believe in the power of connectivity to change lives and will continue to invest in building a high-quality network which will enable our people and businesses to prosper."

Liquid has also introduced fibre-to-the-home services in Zimbabwe, and plans are now under way to launch networks in Kenya, Rwanda and two other countries in the region.

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# Etisalat plans to be the region's first operator to launch 5G

Etisalat Group and Ericsson will exchange knowledge and share their solutions to develop 5G.

Abu Dhabi-based Etisalat has extensive operations in African countries, including Tanzania (Zantel), Sudan (Canar), Egypt, Nigeria, amongst others. The operator plans to be the first in the region to roll out 5G in the coming years. In tests carried out in 2014, it claims it has already demonstrated



Etisalat Group CTO Hatem Bamraf believes partnership is essential to bringing 5G to the market.

115Gbps data transmission capability as part of the development of fifth generation mobile technology.

It will also work with Ericsson to develop LTE's potential speed of

450Mbps. This can be achieved using License Assisted Access (LAA), an LTE-A feature that leverages the 5GHz unlicensed band in combination with licensed spectrum to deliver a performance boost for mobile users, especially indoors.

As well as enabling carrier aggregation of licensed and unlicensed bands, LAA optimises wireless network resources and improves app coverage for all users,

regardless of whether their devices are using licensed cellular or Wi-Fi.

According to Etisalat, LAA "spearheads" the journey to 5G. The group's CTO, Hatem Bamraf, adds: "Partnership is essential to bringing 5G to the market. Through our collaboration with Ericsson, we hope to gain a deeper understanding of the full potential of 5G, and subsequently accelerate the transition to a networked society."

## Peering is crucial in helping to close the digital divide

NAPAfrica has warned that without innovative approaches to bridging the digital divide, Africa is unlikely to ever have full access to critical information. It says the continent has yet to fully realise the benefits of peering which is currently under-utilised.

NAPAfrica claims to be Africa's largest internet exchange (IX) point, and is based at Teraco's carrier- and vendor-neutral data centre facility in Johannesburg.

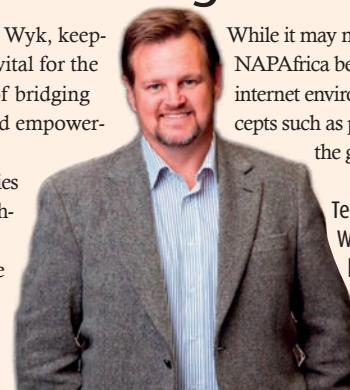
"There is significant proof that peering is not only fundamental, but also an essential part of any network landscape, particularly across borders," says Teraco CEO Lex van Wyk.

As an example, he cites Skyband in Malawi which was routing content via Europe and back again. The ISP was able to cut its relatively high IP transit costs through peering with NAPAfrica and having multiple diverse paths between Malawi and Johannesburg.

According to van Wyk, keeping content local is vital for the continent in terms of bridging the digital divide and empowering local businesses.

"If African countries started working together, we could grow the continent and provide better services and distribute content more economically.

While it may not solve the issue, NAPAfrica believes a progressive internet environment and concepts such as peering could close the gap significantly."



Teraco CEO Lex van Wyk believes that keeping content local is essential for empowering African business.

## Google maps out the business sector across Africa

Google says it currently has a team in South Africa that is working to make information on Google Maps about businesses on the continent "more comprehensive and accurate".

The search giant is aiming to develop a full list of all businesses and their locations in Africa, according to an entry on its regional blog. The move

is part of its *Footprint* project that aims to verify and improve existing business information, correct inaccurate listings, and create listings for new businesses.

The company assembles local teams in each country who then walk the streets with their smartphones and collect information about businesses (with the owners' permission).

Google programme manager Jacqueline Rajuai says that over the last two years, the company has added more than 200,000 business listings to Google Maps in Lagos, as well as in Nairobi, Mombasa, Malindi, Kisumu and Eldoret in Kenya.

"The business listings can now be found on Google Maps, search, and

Google+," writes Rajuai. "This should mean that you can more easily find businesses you're looking for, and that businesses find it easier to have a presence on the web."

She adds that the information Google collects includes name, address, phone number and working hours of a business, as well as its precise location.

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# Nokia and Alcatel-Lucent to merge

Nokia plans to take over Alcatel-Lucent in all-share transaction that values the French company at EUR15.6bn (around USD16.6bn).

In mid-April, the two firms announced an MoU under which Nokia will make an offer for all of the equity securities issued by Alcatel-Lucent. Directors from both companies have approved the terms of the proposed deal which is expected to close in the first half of 2016, subject to customary conditions.

The combined company will be called Nokia Corporation. It will include more than 40,000 R&D employees from Alcatel-Lucent's Bell Labs and Nokia's FutureWorks

divisions. Their aim would be to accelerate development of future technologies including 5G, IP, SDN, cloud, the Internet of Things, analytics, sensors and imaging.

Nokia Technologies will remain a separate entity with a focus on licensing and the incubation of new technologies. But Nokia has begun a strategic review of its HERE business, which specialises in mapping and location technologies, and is considering its sell-off.

Nokia Corporation will be headquartered in Finland with Risto Siilasmaa as chairman and Rajeev Suri as CEO. Alcatel-Lucent shareholders will own 33.5 per cent

of the fully diluted share capital of the combined company, and Nokia shareholders will own 66.5 per cent, assuming full acceptance of the public exchange offer.

On the basis of the transaction closing in 1H16, the corporation will target around EUR900m (USD986.7m) of "operating cost synergies" to be achieved on a full-year basis in 2019. These will include organisational streamlining, and the rationalisation of regional and sales organisations, overlapping products and services, central functions, etc.

Job losses have not as yet been announced. Nokia says it intends to maintain employment in France that

is "consistent" with Alcatel-Lucent's 2015 Shift Plan commitments. In addition, the company expects to expand R&D employment with the addition of several hundred new positions targeting recent graduates with skills in future-oriented technologies, including 5G. To ensure ongoing support for customers, activities for care services and pre- and post-sales are expected to continue as well.

Nokia Corporation is expected to have a strong balance sheet, with combined net cash at 31 December 2014 of EUR7.4bn (USD8.1bn), assuming conversion of all Nokia and Alcatel-Lucent convertible bonds.

## Speedcast aims to power ahead in energy comms sector

SpeedCast claims it is now "well positioned" to become a top-three player in providing satcoms to the energy services markets with a number of recent deals, including the acquisition of Hermes Datacomms.

In mid-March, the company said it had signed a definitive agreement to buy Hermes for an undisclosed sum. UK-based Hermes offers communications services using satellite, fibre and radio to the oil and gas industry in more than 50 countries around the world. It has several clients in Africa, notably in Angola.

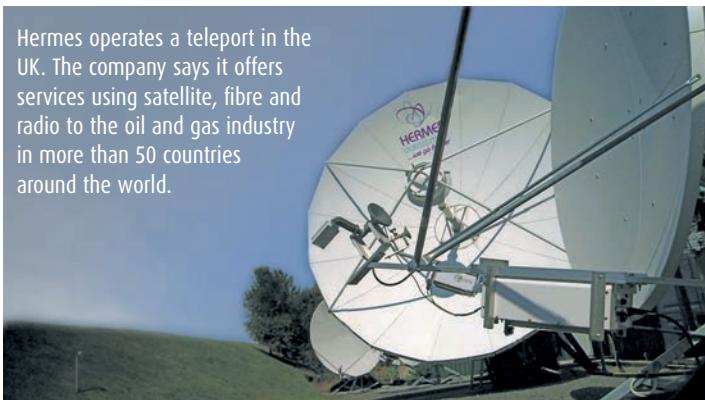
According to SpeedCast, the acquisition will "create a new global force providing communications and IT services to the energy sector". It says the deal will significantly strengthen its capabilities to serve and support energy customers worldwide and enhance its portfolio of managed solutions.

SpeedCast also expects to bolster its global network with new POPs in key energy markets around the globe including North, West and East Africa, the Middle East, Central and South East Asia, and Russia.

"Hermes has amazing experience servicing oil and gas customers in very demanding locations," says SpeedCast CEO Pierre-Jean Beylier. "[It] is a unique asset that brings us capabilities and relationships that would otherwise be difficult and long to acquire."

In February, SpeedCast also announced the acquisition of Geolink Satellite Services. It said the buyout,

Hermes operates a teleport in the UK. The company says it offers services using satellite, fibre and radio to the oil and gas industry in more than 50 countries around the world.



which is subject to regulatory approval, will boost its services for the energy and maritime sectors, and enhance its MSS portfolio in Africa. Details of the transaction were not disclosed.

France-based Geolink is part of the CETel Group and specialises in both MSS and fixed VSAT services. It is said to have customers in more than 20 African countries, particularly in the oil and gas, mining, media, NGO and maritime sectors.

SpeedCast says the deal will support a growing number of its Asia-Pacific customers who are asking for services into Africa. It adds that the continent continues to be a growth spot for VSAT services and therefore represents a new potential source of growth.

## HTS to propel satellite backhaul

Current and next-generation solutions for wireless backhaul via satellite are forecast to generate healthy revenue streams from USD1.7bn in 2014 to USD5.3bn by 2024, according to Northern Sky Research (NSR).

In its *Wireless Backhaul via Satellite* report published in mid-April, NSR said a "robust market" is increasingly impacted by non-GEO high throughput satellite (HTS) programmes, specifically with LEO HTS presenting both challenges and opportunities for the industry.

According to the report, various service offerings will continue to target all market segments, posing risks as well as rewards.

NSR said traditional FSS capacity in C- and Ku-bands has so far been the most prevalent solution used for backhaul and trunking in land areas and has begun to address the need for 3G services. The analyst believes this capacity has also made a "compelling business case" for mobility platforms in the maritime and aeronautical sectors, serving the needs of high-paying passengers for the provision of Wi-Fi services.

But it added that less expensive and higher throughput capacity is challenging the economics of

traditional FSS where erosion of the revenue base is leading to an 'HTS play' by operators that own traditional FSS transponders. "GEO HTS capacity is making a big push on land, air and sea where a clear migration in the fixed land towers backhaul and trunking markets is underway," said the report.

While non-GEO HTS is still in its infancy, NSR said it promises better latency with the likes of O3b making inroads in backhaul, trunking and mobility platforms. It added that although few details on LEO HTS programmes have been released, if one or two of these are launched, total capacity will increase manifold leading to price pressure for all offerings.

With so many LEO satellites and so much capacity proposed, NSR said many questions have arisen on programme viability in terms of both launching the systems and gaining positive returns if they do launch.

"Non-GEO HTS equipment pricing, specifically antenna systems, will have to come down dramatically compared to current O3b pricing in order to address capex considerations," said report author Jose Del Rosario.

"More importantly, although backhaul is a large and growing market, other applications will have to be targeted by LEO HTS systems as the market opportunity is relatively limited given that all systems will target this market space. Incumbents will surely respond to the LEO HTS threat in terms of lowering their own pricing such that the LEO HTS impact until 2024 is likely to be limited."



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## Vodafone and BTCL partner in Botswana

Under a new non-equity partnership agreement, Botswana Telecommunications Corporation Limited (BTCL) and Vodafone will jointly offer business and consumer customers a range of products and services in Botswana.

Vodafone claims to be the largest international voice carrier, and says BTCL will be able to leverage its best practices and scale, as well as access its global data reach and a competitive cost base for international calls.

For Vodafone, the agreement means it can use BTCL's extensive network coverage. It says multinational corporate clients will benefit from the addition of Botswana to their existing contracts for international managed services, while continuing to be serviced via a single point of contact.

## ZTE partners with Mitsumi

ZTE has chosen Mitsumi Distribution as its distribution partner in Africa.

With a network of more than 3,000 resellers, Mitsumi claims to be the continent's largest distributor of telecommunications, IT and consumer electronics equipment.

ZTE says the partnership will enable better product availability in the region while strengthening its presence in Africa. The agreement with Mitsumi covers: Botswana, Burundi, Cameroon, Côte d'Ivoire, DRC, Ethiopia, Ghana, Kenya, Madagascar, Mauritius, Namibia, Nigeria, Rwanda, Tanzania, Tunisia, Uganda, Zambia and Zimbabwe.

The companies have also agreed to co-invest in technical support staff, sales and market development activities to enable the adoption of the vendor's products.

ZTE says it will leverage Mitsumi's capabilities and "strong presence" in Africa to further strengthen its reach within the region. MEA marketing director Hong Chuangye adds: "Mitsumi's service centre, logistics credit facilities, and market knowhow give us the confidence to achieve our business objectives."

## Top African business schools collaborate on entrepreneurship

Six of Africa's top business schools from five countries have formed a new academic association to boost entrepreneurship and job creation.

The African Academic Association on Entrepreneurship (AAAE) will promote and develop academic cooperation through sharing resources, expertise and research.

The American University in Cairo (AUC) in Egypt will serve as the coordinator of the collaboration until a structured steering committee has been appointed.

The five other organisations in the AAAE include: the University of Cape Town Graduate School of Business (UCT GSB) and the University of Stellenbosch Business School in South Africa; Esca Maroc Ecole De Management of Casablanca, Morocco; the Lagos Business School in Nigeria; and the Strathmore Business School of Nairobi in Kenya.

Sarah-Anne Arnold, manager of the MTN Solution Space at UCT GSB, said promoting the exchange of ideas, experiences and skills is core to building an entrepreneurship ecosystem in Africa.

"If we want to build our continent then we need to invest in building networks that are broader than any one single institution. The fuel to innovate is created when people

with different experiences, realities, passions and ideas come together with the mandate and support structures to develop new possibilities."

The AAAE hopes to expand over the coming months to include more African business schools. It also aims to invite collaboration between global business schools and build bridges between academic and industry knowledge.

## Airbus Defence and Space to use SES for Terralink service

Airbus Defence and Space (ADS) has signed a multi-year, multi-transponder agreement with SES to deliver managed satcom services to corporate customers in Africa and globally.

The company plans to harness SES' latest satellite technology as a platform for *Terralink* – its new satcoms platform that is due for launch later this year.

To secure full coverage and flexibility on its VSAT services across Africa, ADS will utilise additional capacity on *SES-5* as well as SES' teleport in Luxembourg combined with its own teleport in Aussaguel, France. The agreement also includes the possibility to expand Ku-band capacity on SES' *ASTRA 2G*, *ASTRA 4A* and *NSS-12* satellites.

## NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
24/2/15	Morten Karlsen Sørby	VimpelCom	Director	Uninor	CEO
27/2/15	Mike Coffey	Wyless	President & CEO	Wyless	President & COO
2/3/15	Christophe De Hauwer	SES	Chief development officer	Arthur Andersen	Consultant
2/3/15	John Aslett	Vislink	GM of sales for MEA	Media Group International	MD
4/3/15	Paul Watson	Sepura	COO	Thales UK	VP, operations
11/3/15	Omotayo Ojutalayo	MTN Group	GM for SME channels, enterprise business unit	MTN Nigeria	Senior manager for SMEs
11/3/15	Bob Driver	Cambridge Wireless	CEO	UKTI	Director for high technology sectors
13/3/15	Jo Lunder	-	-	VimpelCom	Group CEO – resigned
13/13/15	Jean-Yves Charlier	VimpelCom	Group CEO	SFR	Chairman & CEO
16/3/15	Kevin McCarthy	Newtec	VP of market development	MTN Satcoms	COO
18/3/15	Anne Bouverot	Morpho	Chair & CEO	GSM Association	Director general
24/3/15	Dov Baharav	Gilat Satellite Networks	Interim CEO	Gilat Satellite Networks	Chairman
1/4/15	Kurt Riegelman	Intelsat	SVP, sales & marketing	Intelsat	SVP, global sales
1/4/15	Michael J. DeMarco	Intelsat	SVP, operations	Intelsat	SVP, marketing & solutions development

## INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
4/2/14	Emerging Markets Communications	General Industry Systems	General Industry Systems	NA	The acquisition of the Norwegian firm strengthens EMC's energy & maritime business segments.
27/2/14	NEC Corporation	NEC Toshiba Space Systems	All shares	NA	NTSpace will become a wholly owned subsidiary of NEC & changed its name to "NEC Space Technologies" on 1 April.
2/3/15	HP	Aruba Networks	Aruba Networks	USD3bn	HP wants to add wireless mobility solutions to its portfolio of wired switching products.
17/3/15	Fastback Networks	Sub10 Systems	Sub10 Systems	NA	The combined entity will address what's forecast to be a \$1.6bn market for sub-6GHz and millimetre-wave solutions for the mobile backhaul market.
23/3/15	(Not disclosed)	Ceragon Networks	IP-20 Long Haul platform	USD4m	The unnamed Tier 1 African operator is expanding its Ceragon-based backbone network to provide hybrid 3G connectivity & full packet-based 4G connectivity in the future.
29/4/15	Emerging Markets Communications	MTN Communications	MTN Communications	NA	MTN Communications uses a hybrid satellite-terrestrial broadband network to provide communications & content for remote locations around the world, especially for the maritime & energy sectors.
1/5/15	Sepura	Telronic	Telronic	EUR127.5m	Reports say Sepura will draw on its debt facility as well as the proceeds of a share issue to fund the purchase of the Spanish PMR specialist.

Evert Dudok, ADS' head of communications, intelligence and security, said the partnership with SES supports his firm's provisioning of connectivity services to mining, energy and humanitarian customers who rely on high bandwidth data and high-quality voice to operate in Africa.

He added: "We are enabling greater collaboration through applications like video-conferencing, improved welfare through personal communication, and better operational efficiency through, for instance, M2M communication and inter-site corporate networks."

## Subscriber increase for MTN Group

The MTN Group added 4.1 million new subscribers during 1Q15. In its quarterly update for the period ending 31 March 2015, the operator said this represents a 1.8 per cent QoQ increase and means that it now has a total of 227.5 million customers.

But it added that growth in South Africa was "muted" due to delays in engaging a replacement distributor and reduced handset sales. MTN South Africa ended the quarter with 27.95 million subscribers, a slight decline from 27.99 million recorded in 4Q14.

Reported data revenue in the country increased by 21.8 per cent year-on-year and now contributes 27.7 per cent to the group's total

earnings. Blended ARPU was down 4.8 per cent to ZAR87.

Registered *Mobile Money* subscribers across the group rose 23.2 per cent to reach 27.4 million across 14 operations

"MTN's results for the quarter were impacted by a weaker macro-economic environment following the reduction in the price of oil in 2014 and continued price competition," said group president and CEO Sifiso Dabengwa. "We continue to focus on our non-voice services which remain the key driver of the group's revenue growth."

## IN BRIEF...

 10.2 million small cells have now been shipped to operators around the globe, according to the latest market report commissioned by the Small Cell Forum.

The study looked at total deployments of small cells to date alongside deployment figures by region and use case. Africa and the Middle East accounted for 282,325 shipments in 2014, while North America leads with 1,011,105 followed by Europe with 418,695, APAC with 356,760, and China with 186,750.

The forum found that more than 75 operators worldwide are now using small cells, with 17,000 deployed in rural and remote applications.

 Liquid Telecom Group has raised USD150m to fund the further expansion of its fibre network in Africa. The loan was facilitated by Standard Chartered and provided by large global investment banks. It will also finance the company's ongoing FTTH builds in Kenya, Rwanda, Zambia (*News, p6*) and Zimbabwe which will provide homes and businesses with unlimited data packages and 100Mbps.

 TelOne has extended its contract with Avanti and will use more capacity from the *HYLAS* 2 satellite to support its 100 per cent universal broadband provision in Zimbabwe. State-owned TelOne is said to operate the second largest fixed line network in Southern Africa after Telkom South Africa. It is Zimbabwe's only fixed services provider and uses Avanti's Ka-band connectivity to complement its existing broadband offering across a diverse customer base, mainly where communications infrastructure is limited or non-existent.

 Eutelsat Communications has set up Eutelsat Government EMEA. It will support providers of end-to-end government services, NGOs and institutional agencies in Africa, the Middle East and Europe.

Located in the UK and headed by former Solaris Mobile CEO Matt Child, the new division will leverage Eutelsat's satellite fleet and will also work in tandem with Eutelsat America Corp.

 The Metro Ethernet Forum is now the Mobile Ecosystem Forum (MEF). Announcing the name change in February, the trade body said new sectors are now using mobile as the "primary digital touch point". It added that its aim was to help members collaborate and accelerate the growth of a sustainable mobile industry that "drives inclusion for all".

MEF also announced seven newly elected members to its EMEA board. Among them, Adia Sowho, head of digital media at Etisalat Nigeria, was elected as vice-chair, while James McNab, CCO and Africa MD of Basebone, was appointed as a director.

 Infinera has announced an offer to acquire metro packet-optical networking specialist Transmode through a recommended public offer to shareholders. The purchase price implies a total equity value for Transmode of around USD350m. Infinera said the acquisition will complement its "strength" in the long-haul optical transport market and its "early lead" in the metro cloud market.

## LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
4/2/15	Motorola Solutions	US	FY14	USD	5.9 (bn)		-2.84	Full-year sales declined 6%; expects a revenue decline of 2% to 4% for 1Q15 compared to 1Q14. This assumes a \$40m unfavourable currency impact, which translates to revenue growth of -1% to 1% in constant currency.
20/2/15	CommScope	US	FY14	USD	3.8 (bn)	NA	2.05	Wireless sales increased significantly in North America, Asia-Pacific & Europe as a result of 4G/LTE rollouts in developed markets & 3G coverage build outs in emerging markets.
22/4/15	Millicom	Luxembourg	1Q15	USD	1,709	565	0.26	Africa revenues up from 13% in previous quarter to 16%, with double digit organic revenue growth in all markets except Chad which saw a 17% decline in USD terms.
23/4/15	ZTE	China	1Q15	RMB	883	NA	NA	YoY revenue from carrier networks increased 8.9%, driven by sales growth in products such as wireless communication systems, wireline switch & access systems, routers & router switches.
23/4/15	Ericsson	Sweden	1Q15	SEK	53.5 (bn)	19.0 (bn)	0.40	Although sales in the quarter increased by 13% YoY, quarter-on-quarter sales in sub-Saharan Africa are down 17%.
28/4/15	Airtel Africa	India	FY14	INR	269,070	61,122	NA	YoY growth down 1%. Exchange rates continue to depreciate versus USD; revenue-weighted currency depreciation during 4Q14 was 8% compared to previous quarter.
30/4/15	SES	Luxembourg	1Q15	EUR	477.8	356.1	NA	YoY revenue is up 2.6%. Expects growth in group revenue & EBITDA of up to 1% (at constant forex) for the year ending 31 December 2015.
30/4/13	Intelsat	US	1Q15	USD	602.3	470.5	0.69	An aggregate decrease of \$11.9m in transponder services is mainly due to a \$10.4m decrease in revenue from network services customers. This is blamed on the competitive landscape, especially for services delivered in Africa, as well as reductions in point-to-point & consumer broadband services.

# Managing the bias in spectrum valuation

If mobile operators encounter the 'principal-agent problem', it could force up prices in a spectrum auction, says GRAHAM FRIEND.

**O**ver the next few years, regulators across Africa will be looking to award the 700 and 800MHz digital dividend spectrum to mobile operators. The process by which this will be awarded will vary from market to market, but irrespective of the process, regulators will almost certainly be seeking to raise significant revenues from the sales.

Before they hand over potentially large amounts of cash, operators will therefore need to estimate their value for the spectrum to ensure they do not overpay. Groups with a strong presence in Africa, such as Airtel, Millicom, MTN, Orange, Vodafone, will often delegate this task to the local business unit. This makes perfect sense as the local management team have a better understanding of the value of the spectrum compared to the head office.

But the task of spectrum valuation can be extremely challenging, and unfortunately the local business unit often lacks the skills and resources to perform an investment grade valuation exercise.

There are many factors that influence the price paid for spectrum at auction and these include the design of the auction itself, the number of bidders, the packaging of spectrum into lots, and the prospect of additional spectrum being awarded in the future.

MNO shareholders will, of course, hope that the prices also reflect the value of the spectrum to the business and this is where bias in the valuation process can result in higher than expected prices.

## Asymmetry of information causes confusion

Economists like to talk about the 'principal-agent problem'. This can occur when an agent (the management of a mobile business) make decisions (the value of spectrum and how much to bid), that affect the principal (the shareholders of the business).

The problem arises when agents are motivated to act in their own interests, which are not aligned with that of the principal. This results in an asymmetry of information between the agent

Graham Friend,  
Managing director,  
Coleago Consulting



(who is better informed) and the principal, such that the principal cannot ascertain whether the agent is acting in their best interests or not.

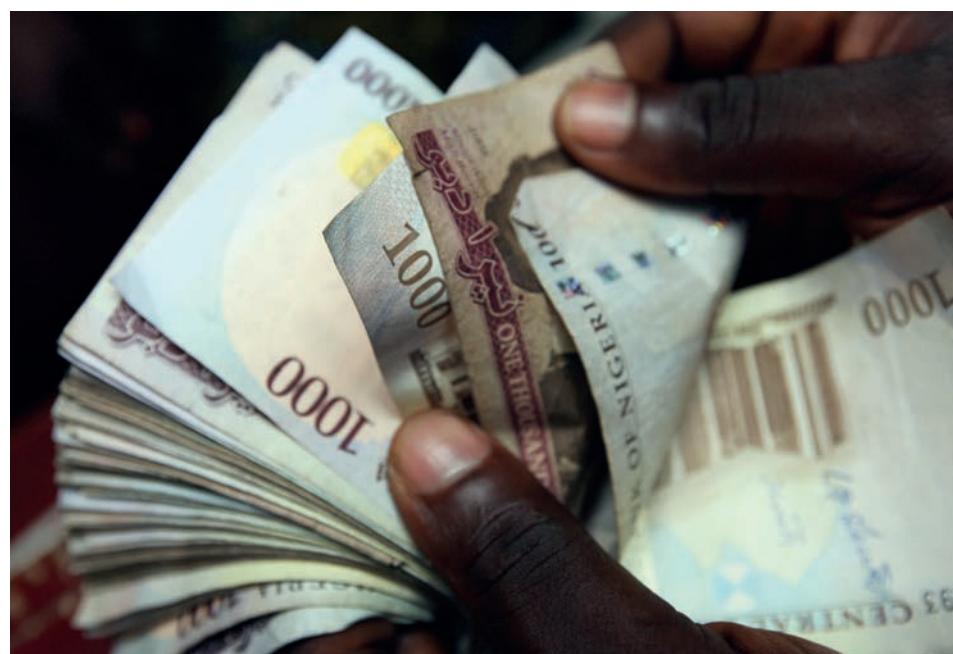
The complexity of the process makes it inevitable that the management team have more insight into the true value of spectrum compared to the shareholders.

It is therefore not surprising that the combination of poorly aligned incentives and asymmetries in information can introduce a significant upward bias in the spectrum valuation process. In nearly every spectrum auction there will be an element of bias leading to upward pressure on prices.

A key question for shareholders or group level executives is how to manage the principal-agent problem. A number of clients have provided us with a very clear mandate to develop an unbiased and independent view of the value of spectrum in order to circumvent the principal-agent problem.

However, the asymmetry of information remains. We have observed local business units sometimes seeking to 'game' the valuation process in order to support higher valuations. In these circumstances, the spectrum valuation process requires a high degree of political, facilitation and persuasion skills on the part of the consultants. They have to provide an unbiased view of spectrum values whilst forging consensus between the group, business unit and the consulting team to ensure the final valuations have full support.

The process of building consensus is best achieved by adopting a spectrum valuation approach that seeks to minimise subjective judgements and uses an evidence-based approach to developing key assumptions. However, as long as shareholders continue to delegate the task of spectrum valuation to the business unit, there will always remain a risk of an upwards bias in the valuation process.



Before they hand over potentially large amounts of cash to regulators, operators will need to estimate their value for the spectrum on offer to ensure they do not overpay.



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# Chameleon offers big power for small cell deployments

Eltek has unveiled two power systems for small cell deployments. The Chameleon 48/650 HE is a standalone rectifier with 20ms or 200ms hold-up time which, according to the firm,

**MANUFACTURER:** Eltek

**PRODUCT:**  
Chameleon power solutions

**MORE INFORMATION:**  
[www.eltek.com](http://www.eltek.com)

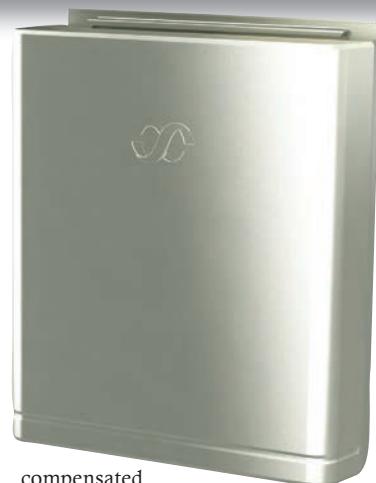
is "just enough" to manage normal mains disruptions without dropping the output. It is said to be small, lightweight and quick to install either on poles or walls, and has a discreet IP-65 rated exterior that is designed to blend into most environments.

The 48/650 HE also features surge protection on input and output, a heat sink for optimal passive cooling, and high-efficiency technology based on the firm's Flatpack S rectifier module. Eltek says this has a compact design to ensure maximum power density.

The Chameleon 48V (pictured) is aimed at deployments where monitoring and battery backup is needed.

It consists of two rectifier units, a box that includes an advanced monitoring unit for system control and easy connection, plus a battery, all contained in one small compartment.

In addition to more power, the 48V offers all of the features of the 48/650 HE plus a complete ~30 minutes backup system at 600W load using 7Ah batteries (not included). It features temperature



compensated charging, low voltage battery disconnect, and a free vented battery compartment. Energy logs with advanced monitoring of battery, performance and temperature are also supported.

## Intelligent site management gets even smarter

Flexenclosure has added several new features to its *eManager* tool which provides remote management and energy optimisation of its *eSite* power systems.

**MANUFACTURER:**  
Flexenclosure

**PRODUCT:** *eManager*

**MORE INFORMATION:**  
[www.flexenclosure.com](http://www.flexenclosure.com)

Amongst the enhanced features, it now offers safe storage and time stamping of all site data to ensure information is never lost. In the event of a communications breakdown between the NOC and the site, all site data is stored in the *eSite* and uploaded to *eManager* once links have been restored.

The tool can now also be used to fully configure *eSite*. All settings can be controlled and adjusted remotely from the NOC, eliminating the need to send specialist personnel to the site.

In addition, users can now securely log in to *eManager* from any connected web browser. Network managers can remotely monitor fuel consumption, schedule refuelling when necessary, manage theft alarms, etc, while maps show *eSite* locations and their operating status.

Working in conjunction with *Diriflex*, *eSite*'s intelligent control system, *eManager* can collect and analyse all relevant site data, storing it in a detailed energy data



warehouse for benchmarking, trend and historical analysis, as well as real-time monitoring.

## Cummins releases its most powerful workhorse

The QSK95 series generator sets are Cummins Power Generation's most powerful diesel generator sets to date, offering up to 3.5MW 60Hz and 3.75MVA 50Hz.

The vendor claims they are engineered with the highest kilowatt per square foot ratio in their class, resulting in a smaller



footprint that achieves a 20 per cent improvement in power density.

As well as offering more power, Cummins claims that the new generators also offer "best-in-class" fuel economy thanks to an innovative fuel injection system. It says that over the course of 8,000 hours of operation, the QSK95 can achieve fuel savings of more than USD400,000.

The company adds that fewer maintenance requirements, longer service intervals (such as three-year or 1,000-hour oil and filter change intervals), and 25,000 hours to major overhaul, makes the generators "ideal" for prime power applications.

## Remote solar power for edge communications kit

ComNet's solar powered systems are designed for applications where a remote camera or wireless repeater is needed but power is either not available or too expensive.

Its *NetWave Solar* range of kits aim to offer a complete system for providing remote power to edge communications equipment. They include: a solar panel; valve-regulated lead-acid battery; solar charge controller; PoE mid-span injector; and an outdoor steel enclosure. The latter has a gasket hinged lid with two tamper proof locks operated by a special key for security.

The 30A solar charge controller features an LCD for local diagnostics and system health monitoring, intelligent PWM charging mode, and battery protection from overcharge/over discharge. ComNet adds that the

battery provides "outstanding" deep cycle and cold weather performance.

Four pre-configured kits are available: the *NWKSP1* and *NWKSP2* each offer a 15W continuous power system with six and three hours of peak sunlight respectively; while the *NWKSP3* and *NWKSP4* each have a 30W continuous power system with six and three hours of peak sunlight respectively. Customised options are also available upon request.

**MANUFACTURER:**  
Cummins Power Generation

**PRODUCT:** QSK95 Series

**MORE INFORMATION:** [www.cumminspowerofmore.com](http://www.cumminspowerofmore.com)

**MANUFACTURER:** ComNet

**PRODUCT:** *NWKSPx* off-grid power systems

**MORE INFORMATION:**  
[www.comnet.net](http://www.comnet.net)

# Cable system aims to speed hetnets and improve 4G coverage

TE Connectivity has combined power and optical communications into one system. It says the resulting powered fibre cable system eliminates the complexity of small cell installations and allows devices to be placed exactly where they are needed for maximum 4G wireless coverage.

The system is said to incorporate everything needed to power and communicate with a small cell –

**MANUFACTURER:**  
TE Connectivity

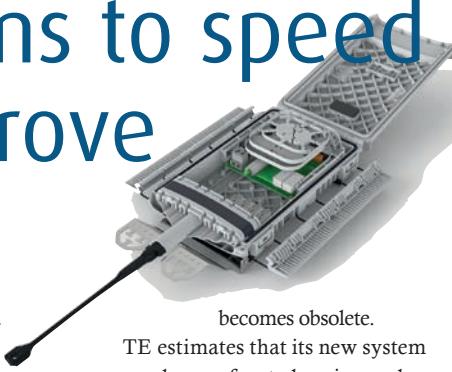
**PRODUCT:** Powered fibre cable system

**MORE INFORMATION:**  
[www.te.com/powerdedge](http://www.te.com/powerdedge)

including the power supply, a hybrid cable, and a remote powering unit that corrects for DC line loss to eliminate the need for electrical design calculations.

TE claims its cable has a reach that is greater than 10 times the distance of standard PoE+ cables. It says the ability to transport power further makes it possible to place small cells exactly where they are needed to focus wireless capacity.

By combining power and fibre communications, the company says local powering is no longer needed. It adds that determining how to obtain power from building owners, utility companies or municipalities is therefore eliminated, and negotiations of who pays for powering the small cell and how consumption is monitored



becomes obsolete.

TE estimates that its new system can reduce upfront planning and engineering time for many small cell deployments by 50 per cent or more. The system is designed for low power DC transmission (NEC Class II), negating the need for highly-skilled electricians, and is also said to simplify installation. Up to 32 devices can be connected simultaneously from one power supply.

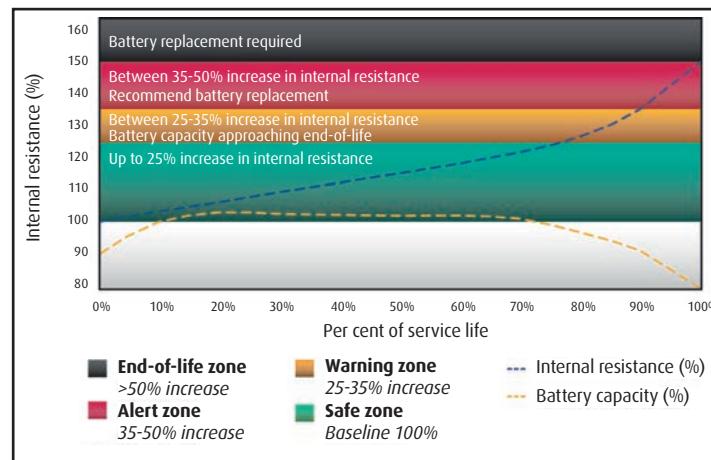
Remote powering units can be factory terminated onto the hybrid cable with exactly the correct connectors for a given small cell. To place a small cell exactly where it is needed, the customer simply plugs in the connector, mounts the remote powering unit, and installs the cable back to the power supply located up to 1km away.

## Life cycle approach will cut battery costs

Emerson Network Power (ENP) claims its *Battery Optimisation Program (BOP)* will help telecom providers optimise the performance and lifespan of DC power system batteries in critical infrastructure environments.

The program uses a tailored combination of traditional discharge testing and what ENP says is state-of-the-art internal resistance tests. It assesses battery health and the impact of various parameters such as battery type, age, discharge cycling and ambient temperature.

Four standard battery management solutions are offered, ranging from a low-cost offering with limited testing, to one that provides a value suitable for the most critical sites (comparable



with the IEEE benchmark). Each one targets different type of site demands and can be further customised to meet specific requirements.

ENP says the program is "dynamic and widely flexible", with different test techniques and frequencies applied to meet various demands in site criticality and budgets.

The *BOP* is based on highly-trained field engineers using standardised data collection templates to safely and accurately collect and report test results and observations.

ENP's battery experts analyse that information, recommend necessary remedial actions, and develop future testing procedures to ensure high reliability of the batteries and network, and to optimise the cost of the battery life-cycle maintenance.

In one recent deployment, the company says it used the programme to design a battery maintenance strategy which not only improved reliability but also reduced the customer's battery maintenance expenses by 25 per cent.

## ALSO LOOK OUT FOR

### RAN energy efficiency standard agreed

The ITU and European Telecommunications Standards Institute (ETSI) have agreed a new standard to measure the energy efficiency of mobile radio access networks.

*Energy efficiency measurement and metrics for telecommunication network (ITU-T L.1330 and the technically equivalent ETSI ES 203 228)* is said to be the first standard to define energy efficiency metrics and measurement methods for live RANs. It provides a common benchmark to evaluate performance, and its application will build uniformity in the methodologies employed by such evaluations, in parallel with establishing a common basis for the interpretation of the results.

The ITU says the standard accounts for the fact that optimising the energy efficiency of equipment within a network does not guarantee the optimisation of its overall energy efficiency. It has been developed to take a more comprehensive view of a RAN, incorporating impacts on energy efficiency caused by the interactions of interconnected equipment within complex networks.

*ITU-T L.1330*'s scope extends to radio base stations, backhauling systems, radio controllers and other radio site infrastructure equipment. The technologies covered include GSM, UMTS and LTE (including LTE-A).

According to the union, the standard offers a pragmatic measurement approach focusing on the performance of 'partial' networks to extrapolate estimates of the energy efficiency of 'total' networks. It provides for a total network to be defined by topologic, geographic or demographic boundaries, enabling estimations of the energy efficiency of an operator's, country's or continent's networks, or networks distinguished by their coverage of urban or rural areas.

The result of these estimations is captured by an assessment report, the form of which is also detailed by the new standard.

**MANUFACTURER:**  
Emerson Network Power

**PRODUCT:** Battery Optimisation Program

**MORE INFORMATION:** [www.EmersonNetworkPower.eu/EnergySystems](http://www.EmersonNetworkPower.eu/EnergySystems)

Towercos are building more sites with co-location in mind. The growth in tenants and upgrading of equipment means increased demands for site access and greater operational complexities.



# The key to a secure cell site

As networks grow to keep up with demand, so do the challenges faced by the infrastructure industry. MICHAEL SOTHAN examines the issues of security and productivity in cell site operations and management, especially from the perspective of access control.

While the number of people enjoying smartphones and mobile data continues to grow, very few of them understand the infrastructure behind it. Even fewer understand the complex network of human labour that keeps this data powering labyrinth of transmission equipment running.

As voice and data services are the core of any carrier's business, their capital investments are focused on these services, part of which is active infrastructure, but possibly even more of which is in soft services such as marketing, app development and media partnerships. Meanwhile, passive infrastructure holds little appeal for MNOs and, as such, is getting further outsourced to managed service providers and their array of contractors.

As operators are moving away from owning

towers to leasing space on them, more new towers are built with co-location in mind. For example, Sri Lanka is currently in a tower building phase, almost all designed for multi-tenancy. This rapid development in the telecoms space leads to new challenges, two critical ones being site security and operational efficiency. The growth in tenants and upgrading of equipment means increased demands for site access and greater operational complexities.

Operators look at tower companies who in turn seek out specialised managed service providers that are really general contractors who sub out most of their workload. As the network of labour grows larger and the network of towers stretches further – including into increasingly poor, remote, or hazardous regions – the challenges of site operations and management (O&M) further increases.

Moreover, the pressure placed on the operators by government regulators for greater QoS continues to increase. This pressure is then passed down through the chain back to the sub-contractors. Strict SLAs are made to ensure uptime is optimal. In India, for example, requirements range from 97 to 99 per cent.

**Most security breaches are an 'inside job'**

One of the basic guarantees offered by a towerco is protecting its tenants' assets. While social issues over land disputes, fear of radiation, noise complaints and the like can lead to public discontent, and criminals may find diesel, copper and batteries enticing enough to vandalise a site, what is ironic is that the majority of security

problems arise internally. Through its interactions with towercos around the world, Acsys has gathered enough data (usually from investigations conducted by towercos on their own operations) to deduce that 95 per cent of theft is due to 'inside jobs'.

Towercos have to keep sites up and running and protect their tenants (and thus themselves) from facing massive fines, while at the same time reducing their own opex. But in order to do all this effectively, they have to find a way to better control and monitor the very people trusted to carry out these tasks in the first place.

To solve a problem, you must find its root. This goes beyond merely fighting the symptoms. Most service companies are staffed by hardworking, honest people. But they may be working hard and honest to follow an imperfect process. Sometimes the root causes of inefficiencies in workforce management stem from the simplest of places.

One major cause is the lock and key systems deployed on many sites. As the architect of 'Big Data', it makes sense that the telecoms industry is demanding more of it to monitor its own infrastructure. As towercos see the ROI potential, a drive for deploying RMS equipment on sites is under way. And yet, even after investing in these devices, determining who is coming in and out of the site, for how long, and why, is left to a hazy world of hearsay and paper trails.

It seems bizarre that one of the most hi-tech industries relies on security systems similar to those in place a thousand years ago. The use of mechanical keys opens the door to all kinds of problems, and the most critical issue is often the most overlooked – wasted time.

Often, when a trouble ticket is generated, a contractor drives to the office only to find that the necessary key is already out in the field. He or she then has to find it, go to the site to remediate the problem, and then drive back to the office to return the key. Now imagine the same situation in the middle of rush hour traffic in Lagos! Furthermore, if the contractor is undertaking emergency maintenance, all this administrative time directly translates to downtime.

Then there are the security risks. One of these is the simplicity of picking mechanical locks – a quick online search can give an aspiring thief the perfect guide. Next there is the issue of copied keys. With SLA adherence bearing down on the shoulders of service providers, many do not want to waste critical time driving to a central office, applying for a key, then driving back to return it. So they simply make a copy of it. And that leads to an unknown amount of copied keys floating around which sometimes remain in the hands of dismissed, and potentially disgruntled, employees.

Many towercos and carriers thought they could reduce the wasted resources in managing mechanical keys by switching to combination locks. But this only exacerbates the security problem. How many people know that combination? One wrongly sent email, open notebook, or worst of all, a leak onto the internet, and then what? Now site visits are

required to update every lock in the network with that combination – we have found that most companies will only use one code for all locks in a region or even an entire country.

Lastly, there is the problem of accountability. Mechanical systems leave no record so when something goes missing or is damaged, who is to blame? With co-located sites the problem is multiplied. So without a clear record on site it is all just a guessing game – and when dealing with multi-billion dollar accounts, who can afford that?

## Mechatronics – the way forward

Cell site managers could deploy a wired access control solution such as a card system similar to that found in offices. But the challenges of connecting cables and control panels to outdoor gates in environments ranging from jungles to deserts, enduring rain to snow (and potentially a violent swing of a hammer), leaves wired solutions out of the equation. Moreover, the complicated and timely process of installation makes the option too much of a financial burden for infrastructure providers to justify.

A battery powered lock is not a good option due to the same lack of durability. Moreover, no one wants to show up at a site to find that the lock's battery has died and the only way in is to completely break the door or cut the fence. Now you need a new lock and a new fence.

Operators need a solution that is easy to deploy, can be readily fitted to a wide variety of assets, and even quickly removed and relocated if need be. And at the same time, it needs to remain secure and robust, and offer the same kind of intelligence as that of a software-based card system. All that represents a considerable challenge.

It seemed this void could not be filled until the emergence of new 'mechatronic' (mechanical and electronic) lock technology. The mechatronic access control industry is still young and currently dominated by a few major players, and while early forms of the technology have been around since the turn of the century, the telecoms industry only began adopting it around five years ago.

Mechatronic locks allow the intelligence embedded in a microchip to be conveniently fitted in standard lock bodies. Because these locks have the same form factor as those already utilised in cell sites, the switch requires no change to site design as well as minimal installation costs and time.

Keys can be programmed to open any number of locks at specific times, providing security and convenience similar to card systems. Because the opening force is still applied by the physical turning of a key, there are no faulty motors, belts, or parts to maintain to reduce the stability of the system. Simply upgrading the security and intelligence of what is already there offers a neat solution, and

the industry has begun to show its agreement through rapid adoption.

While mechatronic locks have grown in popularity, they are often close to 10 times the costs of regular lock. And until recently, they did have a few key weaknesses which made it hard to justify such investment.

For instance, if a key is programmed to open a large number of locks, for say three months, what happens if the key is lost early in that timeframe? This requires the towerco to send someone to every site to electronically update the lock and blacklist the lost key.

Another issue is that while a record of the access is stored in both the lock and key, there is a vacuum of information until the key is returned to download its logs. Since keys are pre-programmed and not online, how can they be controlled in real-time while simultaneously being made available for use?

Acsys' answer to these problems was to first add a keypad to the key, thus removing the fear of a lost device falling into the wrong hands. An *Acsys Keypad Key* cannot be activated until the user's PIN is entered. Three wrong entries and the key is blocked, just like a credit card.

So what if the person who is fraudulently using the key is its owner? And what about real-time control? This prompted the creation of our patented *Code Generation System (CGS)*. Functioning on the same principle as token generating systems in online banking, *CGS* requires the user to request an opening code. This code is randomly generated by software in real-time, transmitted to the user and input into a special keypad key, activating the key for a limited period of time. When the technician needs to lock up the site, he or she requests a closing code and repeats the same process.

The code given is completely site and asset specific. It automatically segments the access granted between sites and tickets, and even to different types of engineers. For example, a genset technician will not gain access to open the LTE cabinet, and the LTE tech will not gain access to the fuel or batteries in the genset.

Last, but definitely not least, is that the NOC is notified of what is happening in terms of maintenance for every site in its network, all in real-time. This is due to the required code request which can be achieved through a phone call, SMS, or an app. Moreover, the system can be seamlessly integrated into a telco's current ticketing platform to paint a complete picture of the state of its O&M.

Many sites are becoming more modular in design (sometimes called 'lite' anchor sites) which allows for easy upgrading of equipment. One



An *Acsys Keypad Key* cannot be activated until the user's PIN is entered. Three wrong entries and the key is blocked, just like a credit card.



To keep sites up and running effectively, towercos have to find a way to better control and monitor the very people trusted to carry out such tasks in the first place.

of the beauties of the Acsys system is that it is designed with a similar modular concept. If users suddenly change and new keys are added, zero modifications are required for the locks on site. For instance, if the cabinet is changed to add 4G equipment, just move the mechatronic padlock to the new cabinet. Any system that is not flexible becomes a great financial risk for the end user.

## The power of data in action

Ultimately, all this is really about the data. The use of both an open and close code provides a good picture of the MTTR for any kind of maintenance. When compared between regions or between different contractors, operators and towercos can quickly determine where their trouble zones are, penalise bad contractors, and reward good ones. This data can be used to set KPIs which in turn help frame SLAs that are fairer for the owner, tenant, and service professionals. If a problem does arise, there is a clear trail of data generated per ticket to audit the situation.

For example, during a site survey Acsys carried out for an operator in South America last year, we couldn't get the key for access because the technicians who had it could not be found. In the end we found them – at the police station. When they accessed the site for routine maintenance it set off a door alarm. NOC personnel saw this but did not know why someone was there or who it was. The alarm was automatically sent to the local police whose monitoring system is integrated with the NOC. They apprehended the technicians for four hours, delaying all site maintenance work. Thus, a discrepancy in communication between the service provider and the NOC lead to an embarrassing and costly situation all because a poor process was in place.

Another example is of a major tower company which trialled Acsys' mechatronic solutions to see if the additional data generated could improve its operations. The firm deployed our solution in a cluster of sites to assess a particular type of maintenance – oil filter replacements on the same model of gensets. By tracking the access data

across three different contractors, the towerco discovered something very interesting.

MTTR was measured by monitoring the in and out times of the contractors based on the code requests for their mechatronic keys. This revealed that Contractor 1 finished the job in an average of just under one hour, Contractor 2 finished between 10 to 15 minutes, and Contractor 3 usually took around two hours.

The towerco then audited each site's genset. The one serviced by Contractor 1 all had new oil filters correctly installed. But while Contractor 2 seemed to be able to do the same thing in under 15 minutes, it turned out that they didn't replace any of the oil filters. Meanwhile, Contractor 3's sites all had new oil filters but it took over twice the time which implies that they were billing the client for long breaks and idle time.

The towerco was able to exploit this data to set a KPI of one hour for all future oil filter changes which it put into the SLAs signed by contractors. This simple piece of data resulted in a saving for the company of USD80,000 in one year.

## Lock into the right process

We often hear criticism that if the locks are impossible to pick and cut then thieves will just cut the fence. If someone really wants to get in they will find a way. But the job of security professionals and the investment in security solutions should be seen from the viewpoint of prevention and deterrence. The more you spend on both, the better. Barbed wire, fortified walls, personal trackers, alarms, lighting, or even CCTV, are all useful in some way. I've even heard of clients in some countries using chickens!

It is important for industry professionals to keep a balanced approach to security investment. Many expensive solutions do very little to prevent theft. For example, CCTV is a passive solution and while it can deter through fear of discovery, it does nothing to stop the determined thief (moreover, a hood or baseball hat is usually all that is necessary to foil the cameras).

The combination of different solutions is more powerful than anything on its own. Using RMS devices to monitor fuel levels, putting a GPS tracker on a battery in the BBU, and using mechatronic locks to control access create a very powerful synergistic effect to prevent against fuel and battery theft.

In the end, what is important is putting a process in place. Once the right process is determined, a system needs to be deployed which reinforces, or even forces, this process to be followed. The beauty of a mechatronic security solution, especially one designed for the telecoms industry, is that it is not just a security solution. It is workforce management; as much an operational solution as physical security. It is data disguised as locks and keys.

## Adopting the right sales mindset

It is important to differentiate opex from capex when approaching the end user for a product or service in the wireless infrastructure industry. Towercos are really financial institutions. They acquire investment, determine where to allocate it, then invest in infrastructure or valued added technology, and bank on its ability to generate returns in the long term through operational enhancements passed on to their tenants. Thus, security solutions should be marketed to tower firms with a capex mindset.

Operators want to keep as much of their capex budget as possible dedicated to the data services that generate revenue. Allocating investment in passive infrastructure and its management to their opex budget is therefore a major advantage. If done correctly, it becomes a monthly recurring fee in their balance sheet which can be used for tax benefits.

So security providers should think 'capex' for towercos and 'opex' for operators. This requires a financial strength and flexibility that not all vendors can offer. Those who fail to innovate in their sales model will find themselves struggling to stay competitive in a shifting market.

In certain emerging markets, as installed capacity increases we are actually seeing ARPU falling. This puts greater pressure on the operator to reduce operating costs to maintain net income. It means that the demands for operational efficiency only increase on the towerco. A small increase in cost like an extra gallon of petrol used in driving time per service visit is erroneously thought to be an unavoidable cost. It is easy to overlook this expense as it is an indirect cost of only a few dollars. But when multiplied over thousands of sites, repeating 50 times a year, it becomes a serious problem. Every minute and every dollar counts. ■

**Michael Sothan,**  
**Business development director,**  
**Acsys Technologies**



# Bridging Education's Digital Divide with Satellite

*Graham Peters, Director at ApTec, a division within leading satellite operator Avanti Communications, discusses Avanti's education proposition for Africa with live deployments powered by resilient Ka-band satellite technology.*

## Sustainable e-learning programmes, underpinned by connectivity and training

Sub-Saharan Africa is home to as many as 224 million school-age children. A large proportion will face significant obstacles in accessing full time education, whether that's sheer distance from the nearest school, poverty or sickness.

Technology is clearly a great enabler: Africa's iGDP is set to reach \$300 billion in the next decade. But in order to deliver any meaningful, sustainable impact for the sector, education programmes must address these barriers – and quickly.

Universal access to digital learning will clearly be crucial for meeting national education targets across the continent. Central to this is reliable internet access, which must underpin any modern education programme. Bridging the chasm between the connected and unconnected is essential.

Avanti connects people wherever they are, irrespective of how remote or rural the location. Through the HYLAS satellite fleet and more than 150 partners in 118 countries, our network provides ubiquitous internet service to 27 per cent of the world's population.

Indeed, our unique education proposition sets out to address the many hurdles governments face in delivering modern education programmes to its communities and people. We have combined technology and training to improve educational outcomes for the long term. Working with governments and businesses across Africa, we are deploying impactful digital education programmes at scale.

Here, we outline three of our major programmes born out of our desire to connect the unconnected.

## Project iMlango, Kenya

The context for Project iMlango was simple: over one million children in Kenya do not regularly attend school, marginalised by societal issues including poverty and distance. A solution was required to measurably improve education and life outcomes for a target of 150,000 pupils.

Led by Avanti and its partners - UK Aid, sQuid, Whizz Education and Camara Education - Project iMlango is a first of its kind e-learning partnership, created to deliver improved educational outcomes in maths, literacy and life skills for marginalised children. The project's name is derived from the Swahili word 'iMlango', meaning doorway or portal.

At its heart sits a dynamic internet learning platform, accessed through high-speed satellite connectivity, where partners provide students with interactive educational content. Project iMlango combines: high-speed internet connectivity to rural and remote schools; provision of tailored online educational content; electronic attendance monitoring with a conditional payment to families to improve non-attendance and drop-out rates; in-field capacity in technology and support resources; and vitally, real-time project monitoring and measurement.

Deployed via Avanti's HYLAS 2 satellite, broadband connectivity powers the programme to ensure e-learning is successfully implemented in 195 remote and rural schools across Kenya over two years.

## iKnowledge, Tanzania

Our iKnowledge programme was recently announced; a major ICT and e-learning programme for teachers in Tanzania that will equip up to 250 schools in rural and underserved areas with ICT infrastructure. Provision of broadband via satellite alongside ICT training and educational content for teachers can be applied straight to the classroom. Delivery is supported locally by educational NGO Camara Education Tanzania and service provider Infinity Africa Network Ltd.

The programme sets out to improve quality levels of teaching in rural and remote areas in core curriculum subjects, alongside advancing teachers' digital literacy through a sustainable training model.

## Connecting NLSA digital library network, South Africa

Right here in South Africa, we have

worked with Meso to deliver a significant programme to the National Library South Africa (NLSA) network.

NLSA appointed Meso Systems and Avanti to collaborate and deliver internet access to South African libraries in close succession, connecting its network digitally. The collaboration brought reliable, high-speed broadband connectivity to hundreds of its libraries, impacting thousands of people interacting with the library network including citizens, SMEs, students and government services.

At each step, the NLSA could record live terminals and new installs; monitor terminal performance and data usage; design and create their own bandwidth plans and usage policies; and communicate with customers. Over six months, over 2,000 connections were made at an impressive rate of 11 new connections per day. The programme is an exciting milestone in education and social services sectors in South Africa.

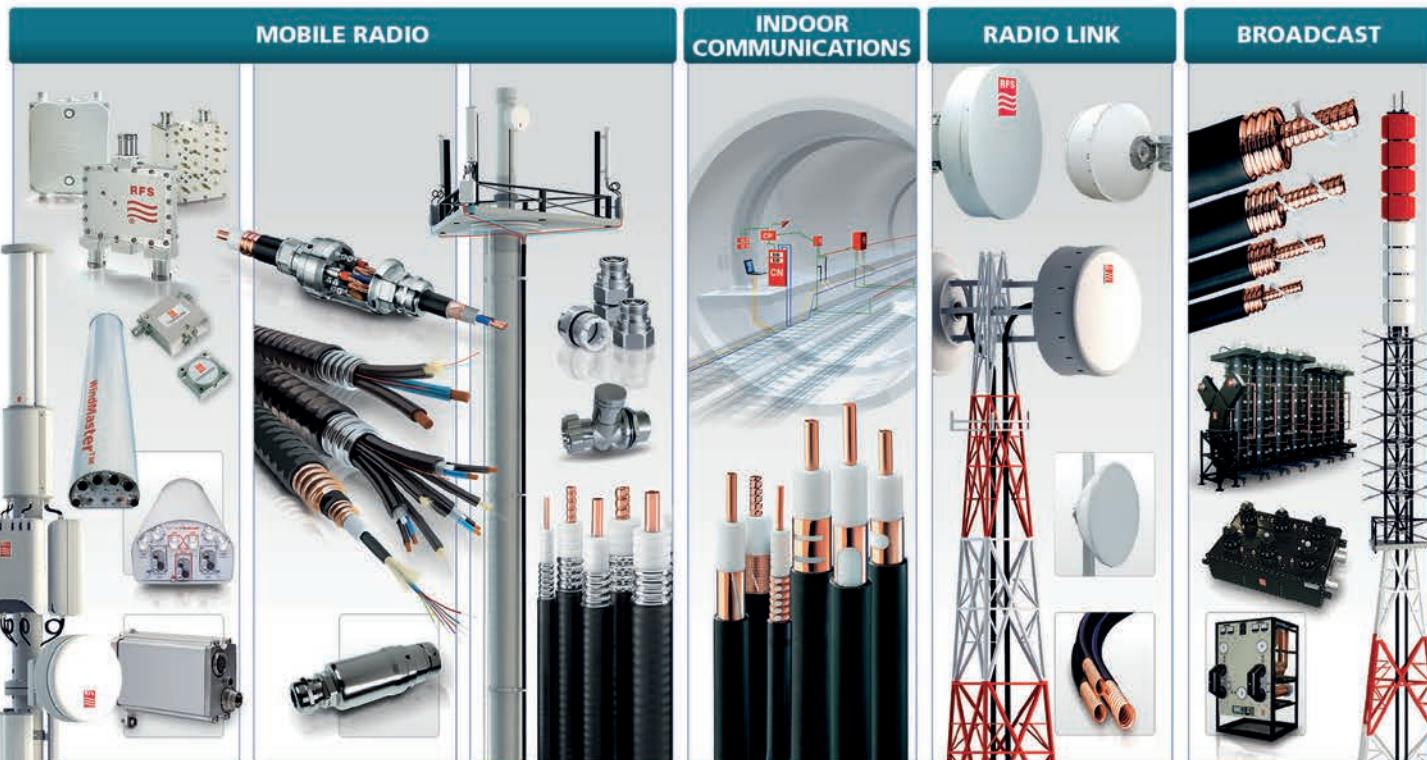
## *This is not a satellite... This is an educated nation*

With three satellites in orbit and a further two satellites under construction, Avanti is well positioned to bridge Africa's digital divide today. Sub-Saharan Africa accounts for more than 80% of our capacity, and as you read this article, this is being deployed to some of the continent's most significant digital education programmes. The opportunity for partners to engage in such large scale success stories is huge. Become an Avanti partner today.

*Avanti Communications is exhibiting at SatCom Africa in Johannesburg, 26th – 27th May. To book a meeting or to find out more, please email [satcomafrika@avantiplc.com](mailto:satcomafrika@avantiplc.com) or visit [www.avantiplc.com](http://www.avantiplc.com)*



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**RADIO FREQUENCY SYSTEMS**  
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Industries across the world have deployed DAMM's de-centralised architecture to secure their mission-critical communications. For example, in harsh environments such as mining oil and gas, the vendor says its *TetraFlex* system has delivered integrated voice and data solutions based on a "true IP backbone".

# Being open – the key to digital migration

Critical radio communications may offer opportunities for firms to make productivity gains, says ALLAN DETLEFSEN.

**A**dvanced networks enable companies to capture major gains in collaboration, workforce productivity and asset utilisation. According to consultancy firm McKinsey, improving production efficiencies by upgrading to new digital capabilities can yield substantial productivity improvements in operations.

So why have so many companies not yet replaced their existing analogue systems with newer, more advanced digital solutions?

Upgrading installations and migrating to new platforms is not without challenges. It requires time and investment; companies may have to apply for new frequencies; current installations have existing wired systems, equipment and components, so there remains considerable uncertainty about the risk of deploying a digital communication system; and personnel may also need special training. What's more, all this may require a big investment in equipment such as terminals, applications and infrastructure, not to mention derived costs such as cold rooms for central IT purposes.

But despite these challenges, upgrading should not be regarded as a bad thing. Like going from old mobile phones to smartphones, people quickly discover they can do so much more with their digital system and can communicate more efficiently.

So here's the key question: how will you prioritise your critical radio communications spend to better run, grow and transform your business?

## Centralised or de-centralised architecture?

Given the challenges, companies need to know the best way to move forward and to ensure that their critical radio communications network will remain viable and relevant in the future.

In some ways, it is similar to the days when companies made the transition from being dependent on large computer systems to adopting desktop computing and mobile PCs. The new technologies simply allowed people to be far more agile and productive.

Not only that, but executives quickly realised that it was a whole lot more cost effective to upgrade PCs rather than huge computer systems as technologies and applications advanced.

In our experience, companies that have successfully pursued upgrades and replacement programmes for their PMR environments consider one of two approaches: should they choose a centralised or de-centralised system architecture? This is a fundamental issue.

Centralised systems tend to require the largest upfront investment, both financially and in terms of the time it takes to design, install and commission. Such architectures operate redundant servers, links and routing paths from a central control site. They may require specific communication protocols and highly trained specialists to design the infrastructure to ensure a stable power supply, and provide housing as well as cooling for the units.

Additionally, centralised systems can be prone to failure because they depend on central switch/control configurations from which units are shared.

This means that when a unit fails, the connection to the central units can fail, and this can have a domino effect throughout the system.

De-centralised systems offer a more flexible option. They give companies the opportunity to start small and then scale out in response to business requirements. Today's de-centralised systems require a smaller initial investment and do not need large engineering teams to design and configure them. Moreover, they tend to be highly resilient in the face of the failure of a single unit because hardware resources are not shared. That means there is simply no single point of failure, so there is no risk of impact on neighbouring units.

From a business perspective, de-centralised architecture models mean higher availability and greater continuity of service. And they have proven interoperability with other vendors' equipment and applications. According to many in the industry, the de-centralised approach is preferred to mandating a single, centrally developed and controlled system across the network.

## The open architecture approach

Companies with successful digital migration programmes think in terms of total lifecycle costs and economics. The key to a de-centralised system (such as DAMM Cellular's *TetraFlex*) is its plug and play simplicity for easy setup, fast deployment, and cost-effective scalability. Basically, it enables companies to think big, start small and scale fast.

When planning a network, capacity and coverage requirements are factored into dimensioning to determine the initial scale of a deployment. With an open architecture, owners and operators can rapidly deploy their networks today and scale fast tomorrow to meet operational demands.

No special infrastructure protection, such as cool rooms, is needed with an outdoor solution. This means that when IP65-rated encapsulated equipment is used, you know it is rugged and built to withstand the most challenging outdoor conditions. All of this keeps upfront costs to a

## FROM PIT TO PORT

How a mining company unearthed the value of a de-centralised and secure open architecture solution.

Fortescue Metals Group (FMG) in Australia is one of the world's largest iron ore mining and export companies. It also runs its own railway which leads to Port Hedland in Western Australia's Pilbara region.

Today, FMG's rail network includes a main 300km route as well as a 130km branch line. The company's rail and mining infrastructure benefits significantly from DAMM's distributed architecture because it has allowed it to scale in response to business requirements.

There are 25 nodes in the rail corridor alone and, thanks to the low power consumption of the IP65 encapsulated outdoor *DAMM Base Station*, many of the nodes are run on solar

power, creating considerable savings. Since no air conditioned housing is needed and power consumption is extremely low, initial installation costs can also be kept to a minimum.

In mining, rail and port applications, DAMM claims that its *TetraFlex* system has proven to be "cost-effective and remarkably reliable". It adds that the solution for FMG is only one among hundreds of successful projects that provide real world proof that is durable and cost effective.

"Installations from the hot climates of Australia to the freezing mountains of Norway have shown that this system, which has no fans or moving parts, keeps maintenance, repair and operations costs next to zero," says the company.

minimum, and it means that investments can be aligned with a company's growth.

The use of open gateways means the system is vendor-neutral and can interface with other technologies. It enables an open architecture system to bridge between TETRA platforms via, for example, the DAMM *Group Bridge* solution as well as interface with analogue networks and terminals.

Additionally, TETRA over LTE is possible operating through Wi-Fi, WiMAX, UMTS (3G) and LTE networks, gaining full benefits of broadband technologies. Plus, it keeps the system open to third-party applications.

Thus an open architecture platform offers distinct benefits with regard to seamless integration capabilities with existing technologies. This helps to avoid being locked in by technology choices, both past as well as future.

## Smarter system thinking

De-centralised networks give users layout freedom,

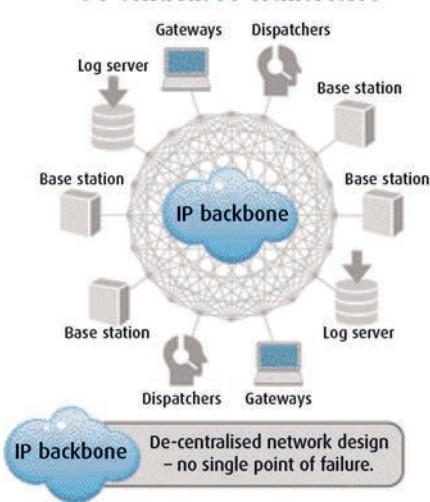
vendor independence, and flexibility with a 100 per cent standard IP backbone. As coverage or capacity needs grow, additional base sites can be readily deployed and seamlessly 'dropped' into the distributed IP architecture. Its standard IP technology connects all network components including indoor and outdoor base stations, dispatchers, network management facilities, logging servers and external gateways in one state-of-the-art intelligent distributed architecture.

The use of intelligent software enables simple and self-configuring site expansion – even while the system is in operation. The entire user interface is Windows-based and has the same user interface many are familiar with, so no special training is required to use it. And from a purely practical perspective, an outdoor base station such as *TetraFlex* is so easy to deploy it only takes a single engineer (rather than an entire team) to mount the mast and ready the system for operation.

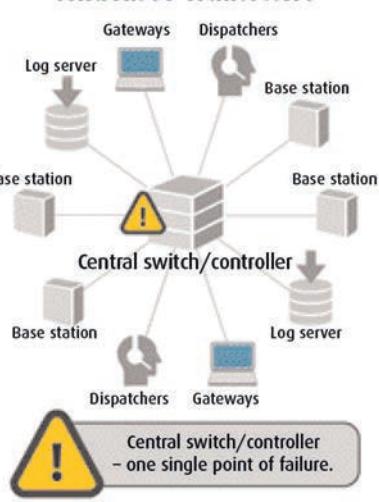
Enterprise managers are constantly under pressure to reduce costs while simultaneously transforming their businesses with new critical radio communications opportunities. Industry experience and prudent risk management dictate that all your options be thoroughly investigated and, if possible, proven in small-scale implementations to begin with.

Ultimately, it's all about spending more on equipment that maximises the value critical radio communications delivers to your business, and less on things that don't. Which may be the best case yet for adopting a de-centralised approach to critical radio communications. ■

### De-centralised architecture



### Centralised architecture



Before migrating from analogue to digital, PMR users need to decide upon a centralised or de-centralised approach to their system architecture.

**Allan Detlefsen,**  
Director of sales  
and marketing,  
**DAMM Cellular  
Systems**

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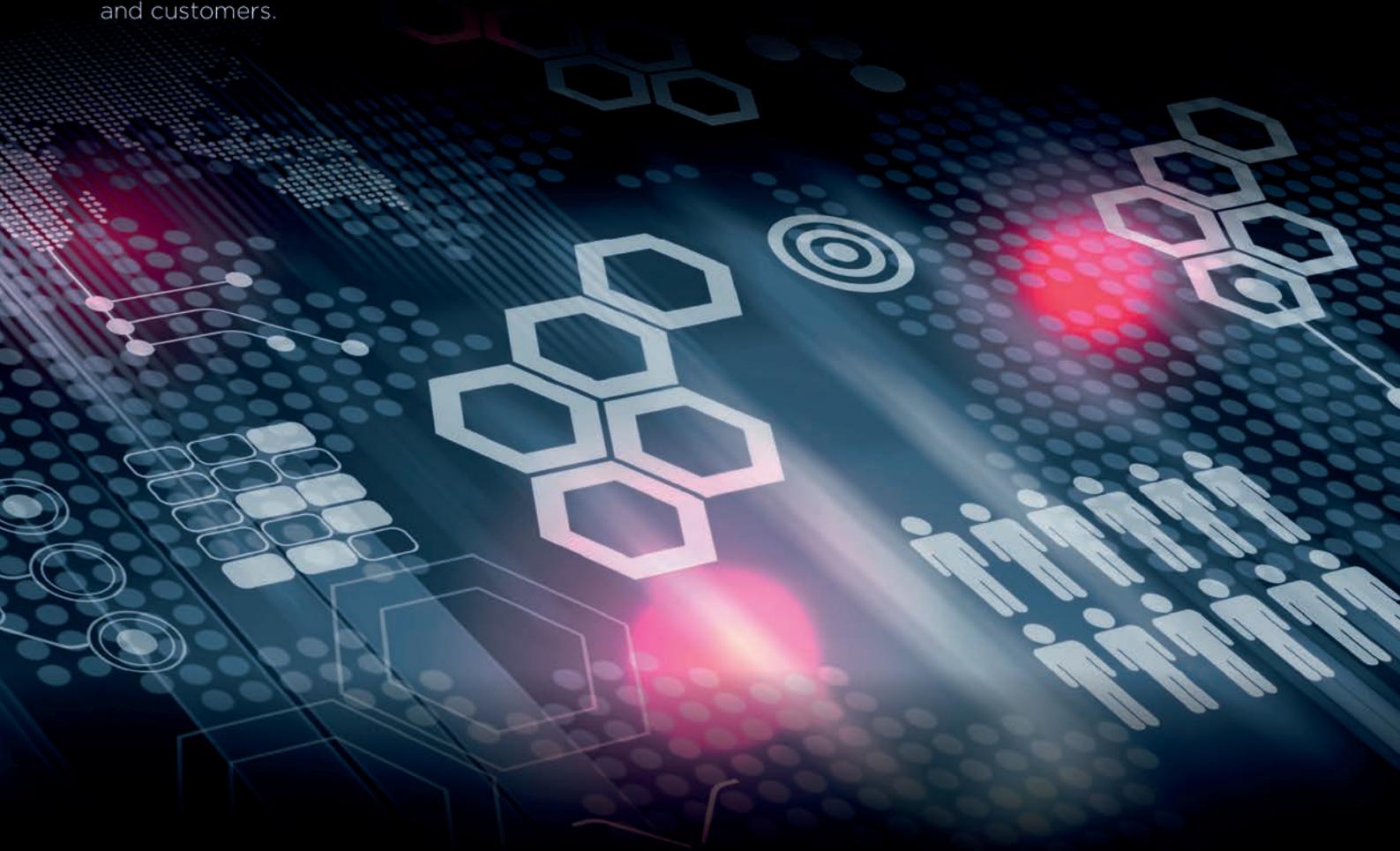
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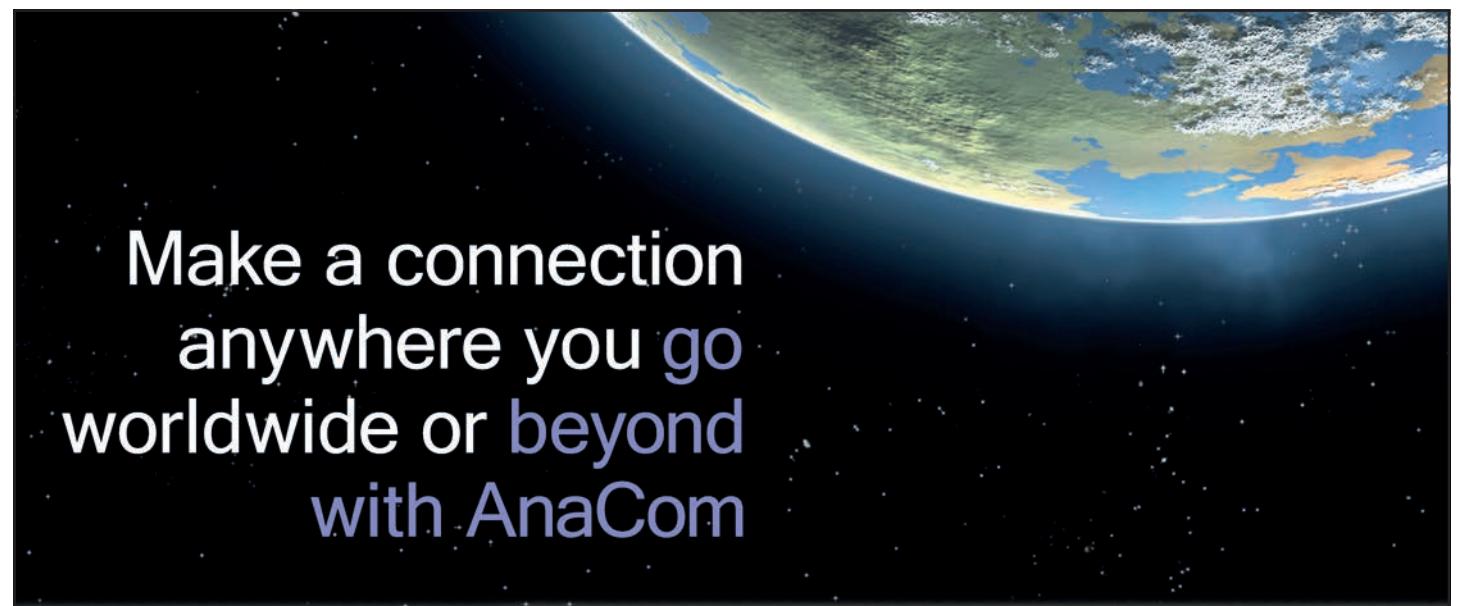
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## Vodafone celebrates 30 years



The first call was made using Vodafone's *Transportable VT1* which weighed 5kg and had around 30 minutes of talk time.

 This year marks the 30th anniversary of mobile telephony in the UK. The country's first mobile call was made on 1 January 1985 on the newly-launched Vodafone network. Michael Harrison, son of former Vodafone chairman Ernest Harrison, was the first to test the system. He called his father using a Vodafone *Transportable VT1* which weighed 5kg and had around 30 minutes of talk time.

The first generation of mobile phones became available for sale in the UK in 1984 even before a network was officially live. Vodafone says such was the demand for a fully portable, cellular phone that more than 2,000 orders had been taken by its sales team before Harrison made his historic call. By the end of 1985, over 12,000 devices, each costing around GBP2,000, had been sold.

In 1983, UK regulator Ofcom awarded two mobile licenses: one went to British Telecom which ran the Cellnet network (later to become O2 before being bought by Spanish telco Telefónica in 2005 for GBP18m); the other was won by Vodafone.

Vodafone was originally formed as a subsidiary of Racal Ltd, an electronics company established in the 1950s by Raymond Brown and George Calder Cunningham. At the time, it was 80 per cent owned by Racal, with Millicom owning 15 per cent, and the Hambros Technology Trust five per cent.

In 1991, Racal and Vodafone de-merged, and the Vodafone Group was publicly listed as an independent company on the London and New York stock exchanges.

## Saudi Arabia's telecoms market is largest in MEA



Saudi Arabia remains the largest telecoms and enterprise IT market in the Middle East and Africa despite a drop in revenues, according to Pyramid Research.

In a report published in mid-April, Pyramid said total mobile and fixed services revenues in the country's consumer and enterprise segment declined by one per cent to USD16.2 billion in 2014. It added that this was Saudi Arabia's first decline in overall service revenue in the last decade.

Pyramid said the drop was the result of "aggressive" promotional activity and the re-statement of results from Mobily, the country's second largest MNO. It saw revenue fall by 20 per cent in 2014.

Despite the declines, the Saudi Arabian telecoms market remained the largest in terms of total service revenue in the MEA region in 2014. It was followed by South Africa with USD13.4 billion and Turkey with USD13.0 billion.

Annual growth in Saudi Arabia over the next five years is forecast to average three per cent per year, reaching USD18.7 billion by 2019.

Hussein Ahmed, analyst at Pyramid Research, said: "Operators have invested in upgrading network infrastructure and systems to handle growing data traffic volumes. The need in the short-term is for swift deployment of fibre connectivity in

high demand areas such as Riyadh, Jeddah, Mecca, Medina and Al-Ahsa. This will improve the competitive services segment, where historically the incumbent operator STC has led."

New operators, which not only target Saudi Arabia but the wider region, are also expected to enter the market. Pyramid said a number of venture capital funds have already launched in the country, including Alkhabeer Capital, Mobily Ventures, STC Ventures and the government's own tech start-up fund.

It added that the entrance of Virgin Mobile and Lebara will add a "fresh impetus" to the mobile market with new promotions for data and voice services.

## HKT converges networks simultaneously



Hong Kong Telecom (HKT) has converged its 4G mobile networks simultaneously using multi-operator core network (MOCN), carrier aggregation (CA) and VoLTE systems from ZTE.

After acquiring CSL in 2014, HKT operated two commercial networks in parallel. It therefore needed to integrate the two as quickly as possible to ensure high quality and seamless services for its subscribers.

As the supplier of one of its two mobile networks, ZTE optimised

HKT's network performance through the use of large-capacity, high-performance hardware as well as the latest software.

In 2012, it provided CSL with a complete IMS-based VoLTE solution with voice call continuity support using eSRVCC (enhanced single radio voice call continuity) technology. The VoLTE network was launched for commercial use in 2014.

With the deployment of MOCN, CA and VoLTE technologies, ZTE says it has now further assisted

HKT to bring its two networks together. It says the end-to-end network sharing solution has enabled HKT to achieve network inter-connectivity, service convergence, and "set the standard" for global VoLTE interoperability.

"KPIs such as VoLTE connection time and voice quality will be near perfect, and users will be able to experience communication services of the same quality as before, and download files at a rate of up to 300 Mbps," claims the firm.

## Eutelsat HTS supports in-flight Wi-Fi



Vueling says it has become the first low-cost airline in Europe to offer high-speed Wi-Fi to its passengers. Last year, the Spanish company began working with Telefónica to install Wi-Fi on its aircraft using connectivity via high throughput satellites (HTS).

In March 2015, the partners announced that the first Airbus A320 with the new integrated service is the EC-LZN. The plane can carry up to 180 passengers who will be able to use their mobile devices during medium haul flights and benefit from download speeds of up to 20Mbps.

Specialist engineers and technicians took several days to install all the Wi-Fi

equipment needed for Vueling's A320. They deployed three access points that are sited behind the aircraft's ceiling panels, as well as a wireless Ethernet bridge, wireless data unit, and an antenna power supply unit.

The heart of the system is located in the avionics bay under the cockpit. Here, a satellite modem is used to send and receive the signal to and from the antenna, and it is also the interface with the baseband signal processing equipment.

Connectivity is provided via Eutelsat's *Air Access* platform and *KA-SAT* satellite. A Ka-band antenna, installed on top of the fuselage, can track the satellite while the aircraft is



Specialist technicians installed three APs behind the aircraft's ceiling panels.

in flight. A protective dome is installed over this external antenna, which is in turn covered by a fairing in order to preserve the Airbus' aerodynamics.

# Google to set up global network

 Google is launching a global network through which it will provide broadband connections and mobile telephony services. The search giant reckons *Project Nova* will enable users to "seamlessly" switch between cellular and Wi-Fi signals, and between masts of competing networks.

"We are creating a backbone so we can provide connectivity," says Sundar Pichai, the recently promoted second-in-command to Google co-founder Larry Page. "We will be working with carriers around the world so they can provide services over our backbone."

"We want to focus on projects which serve billions of users at scale and which make a big difference in their every day lives."

Pichai claims Google does not want to compete with existing operators and other national carriers around the world. "We don't intend to be a network operator at scale," he says.

"All innovation in computing happens at the intersection of hardware and software. That is why we do *Nexus* devices. We do it at enough scale to achieve impact. We are at a stage now where it is important to think about hardware, software and connectivity together."

Speaking at Mobile World Congress in February, Pichai also set out the company's plans to bring four billion people online.

"We think we can bring first-world connectivity to many rural areas. You can imagine planes and balloons which we can stitch together to create this mesh of floating cell towers. It sounds like science fiction at first but we've made tremendous progress," he said.



Sundar Pichai, SVP of Android, Chrome and Apps, says Google does not want to be a network operator "at scale".

# SMS-based system warns of natural disasters

 A warning system that uses mobile phones to alert people about impending natural disasters has been launched in India.

The system, commissioned by the Indian government, will be able to send warnings via SMS to all those living in Indian Ocean countries. It is based on technology developed by the Indian National Centre for Ocean Information Services (INCOIS) and RegPoint, a UK-based health services company focused on bringing wireless technology to the global healthcare community.

According to RegPoint, as soon as there is an earthquake, INCOIS can identify its location and depth and

accurately predict within 10 minutes how high and what time a wave will hit the shore. The analysis is carried out at the tsunami centre in Hyderabad. It is based on data from hundreds of buoys that have been placed in the Indian Ocean and thousands of computer models that have been developed based on a variety of tsunami scenarios.

The system has the ability to send text messages immediately to all mobiles in a designated locality. Locals or tourists in India can register for the service by going online or at street stalls in coastal towns, cities and villages. They will simply have to provide their address, mobile number, and preferred language.



The tsunami that struck the Indian Ocean region in 2004 was the world's worst-ever natural disaster. It affected 18 countries, claimed more than 250,000 lives, and left 1.7m people homeless.

# ITU creates database for e-Health devices

 The ITU has launched its ICT Product Conformity Database which showcases ICT products and services that comply with ITU-T standards.

e-Health devices covering 23 classes of technology are already in the database and will help buyers select standards-compliant products. The products were tested by third-party labs for compliance with the ITU-T H.810 Interoperability design guidelines for personal health systems.

This key ITU standard was approved in December 2013 and are based on design guidelines developed by international not-for-profit industry group Continua.

The suites used for testing the conformance of e-Health products will be published as 32 standards in the ITU-T H.821-H.850 series. They include more than 1,000 test cases for the functions implemented by personal health devices such as thermometers, blood pressure and pulse meters.

They also test the conformance of gateways that consolidate measurements from various devices and transmit health data.

Continua's guidelines describe the various interfaces between the LAN, personal area network, touch area network health devices, and application hosting devices including NFC, USB and low energy Bluetooth Smart Technology; along with consent enforcement via a WAN and Health Record Network devices.

# SK Telecom and Nokia commercialise eICIC

 SK Telecom and Nokia Networks claim to have become the first companies to have commercialised Enhanced Inter-Cell Interference Coordination (eICIC).

eICIC is a technology that controls signal interference between macro and micro base stations to enhance LTE-A network performance. By deploying eICIC, SK Telecom expects to be able to offer higher quality connections.

By using the new technique, the operator says it will be able to reduce inter-cell interference by 15 per cent in traffic-congested areas where macro and micro cells are concentrated.

SK Telecom has applied eICIC to its LTE-A network in Gwangji Metropolitan City, and plans to roll out the technology to the rest of its



SK Telecom has strengthened its cooperation with Nokia to develop and commercialise 5G technologies.

nationwide LTE-A network by the first half of 2016.

Nokia and SK Telecom say they have now moved a step closer to realising fifth generation mobile technology as they believe eICIC will be an essential component in the era of 5G where heterogeneous networks will become more complex.

The two firms have signed a memorandum of understanding pledging to work together on 5G. They will collaborate on research to develop core 5G technologies and say they will make "all-out efforts" to demonstrate 5G in 2018 and commercialise a service in 2020.

A test bed at SK Telecom's Corporate R&D Centre in Bundang, Seoul, will be set-up to verify and demonstrate 5G technologies.

In particular, SK Telecom and Nokia say they will develop 'cmWave/mmWave which uses wideband spectrum resources in ultra-high frequency bands (6GHz or higher) for data communications. This is currently being discussed as one of the core 5G technologies by standards body 3GPP.

## Monastery goes global with wireless

 Monks in Russia have turned to InfiNet

Wireless to set up a network that will enable them to broadcast their services via broadband.

The Monsegur Monastery lies in a remote area of the Dmitrovsky district in Moscow. Its location is some distance from any populated area, and attendance of its services has been subject to a slow decline over recent years primarily due to the secluded location.

In order to use broadband for its broadcasts, the monastery needed a direct comms link to the main infrastructure hub, a distance of more than 15km across difficult terrain. It also needed a system that could endure Moscow's very harsh climate where winter temperatures can dip below -18° Celsius.

InfiNet proposed using wireless technology as this would not only work with minimal intervention at the high bandwidth and speeds required over the distance, but also save time and money.

It deployed its *InfiLink 2x2* point-to-point BWA system, and claims the system is easier to upgrade compared to laying more physical cabling or deploying extra wireless units. Increasing capacity is just a matter of 'switching on' additional wireless links in the base station's software, says the firm.

According to InfiNet, the link has enabled the monastery to broadcast video and content with a consistent throughput of at least 200Mbps.

It adds that while extreme weather often creates problems for wireless line-of-sight systems – such as signal dispersion, signal degradation or interference from heavy snowstorms and freezing fog – its link has been "coping admirably" with the harsh climatic challenges.

The monastery now broadcasts to more than 500 members daily and has been able to rebuild a strong following from both the local and global internet community. It has even expanded its range of services and is providing content via online radio and cached video, in addition to its live-streaming broadcasts.

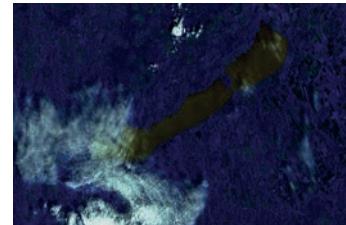
## Scientists use 'superhero vision' for lake analysis



An international team of scientists have used what they describe as "superhero vision" to assess the water quality of lakes in Europe, and to discover why the reeds that surround them are dying.

Using the Medium Resolution Imaging Spectrometer (Meris) which is hosted on *Envisat*, the Earth-observation satellite operated by the European Space Agency, the researchers have demonstrated a way to visualise pollution levels that are otherwise invisible to the human eye.

The team comprises scientists at the University of Leicester, the Hungarian Academy of Sciences, and industrial partners. They have dubbed



When algae grow in lakes, they contain the green substance known as chlorophyll-a, as this satellite image of Lake Balaton shows. PHOTO: VIKTOR TÓTH

the imaging technology "superhero vision" because it has enabled them to see wavelengths which our eyes cannot see, as human sight can only detect red, green and blue light.

While these methods have previously been used for seas and oceans, they are not readily available for lakes, especially shallow ones with complex optical environments defined by a mix of different natural substances in the water.

The subject of the experiments was Lake Balaton in Hungary. The team also examined the phenomenon of 'reed die-back' around the lake.

They used imaging spectroscopy and hyperspectral data collected from sensors on board aircraft and satellites that can measure radiation such as near-infrared wavelengths. The data will be analysed to learn more about the ecological status of the reed plants.

## Turksat deploys Jupiter for Ka-band



Turksat has selected the *Jupiter* high-throughput ground system from Hughes to enhance its satellite services across Turkey and neighbouring countries in Europe and the Middle East.

The deployment of the system will enable Turksat to provide a variety of high-speed Ka-band satellite services to consumers, private sector users, and governmental organisations such as schools. The operator plans to offer these services after it launches *Turksat 4B* in early 2016.

According to Hughes, *Jupiter*'s modular design makes it the "ideal, future-proof platform" for operators to gain technology and cost advantages. It says the system employs a novel 'system on a chip' to power the remote terminals and numerous other advances including an enhanced air interface featuring wideband carriers.

Turksat provides TV broadcasting and data communication services throughout Europe, Turkey, Africa, and Asia. It also offers cable TV broadcasting and internet services,

which are provided to subscribers via its fibre optic cable infrastructure.

The Turkish e-Government gateway is also operated by Turksat, and offers access to all government services electronically.

Hughes Europe MD Chris Britton says: "Turksat is an innovative company that wanted a best-in-class solution. [It] chose *Jupiter* for its technology innovation to harness the power of the industry's new breed of satellites, bringing high-speed satellite services to a wider audience."

## Leo Express boasts faster Wi-Fi speeds



Czech train operator Leo Express claims internet speeds on its intercity fleet have more than doubled since the installation of Nomad Digital's *PEP Charger* software.

The firm hopes the faster internet speeds will help it lure passengers away from the competition, and enhance the journey experience across its fleet.

Nomad says *PEP Charger* is designed to utilise all of the available bandwidth and claims that it improves the flow and share of information onboard. In a recent test of its software, the company says that the number of five-megabyte files downloaded in less than 30 seconds increased by 86 per cent, with

incomplete download rates cut to three per cent across the entire route.

"People increasingly travel by train to allow them to work or use their laptops and smartphones while on the move," says Leo Group chairman Leoš Novotný. "We've seen a dramatic increase in occupancy, and one of the primary influencers seems to be our exceptional passenger services, with the reliability and speed of Wi-Fi being an integral part."

Leo Express launched at the start of 2013 and selected Nomad to provide the passenger Wi-Fi service on its *Stadler Flirt* fleet. "In the first three months we carried more than 300,000 passengers and saw the levels



of occupancy on our trains rise to 75 per cent," says Novotný. "Unrivalled Wi-Fi and passenger comfort is something we consider paramount to our future success."

## AeroMobile on A380

 The world's largest passenger aircraft now has AeroMobile's in-flight mobile phone network installed, giving passengers and crew the ability to roam while in the air using their mobile devices. The Etihad Airways A380-800 aircraft's inaugural flight with AeroMobile technology onboard was from Abu Dhabi to London Heathrow and touched down on 13 February 2015. Etihad also has AeroMobile connectivity on board 59 of its other aircraft.

## BT finalises EE deal

 British Telecom has bought EE, the UK's largest mobile phone network, for GBP12.5bn. The deal further consolidates BT's dominant position in the UK as a communications giant covering traditional fixed phone lines, mobile, broadband and television. BT chief executive Gavin Patterson says the acquisition provides an attractive opportunity for the firm: "[It will] generate considerable value for shareholders, with significant operating and capital investment efficiencies supported by our tried and tested cost transformation activities."

## ZTE finishes VoLTE tests

 Global telecoms technology provider ZTE says it has completed China Mobile's Voice over LTE (VoLTE) tests ahead of its competitors. The vendor's IMS (IP Multimedia Subsystem) solutions deployed in the China Mobile test are said to have delivered "robust and stable network performance". Deployment of VoLTE services is accelerating globally. By September 2014, there were 51m subscribers and 11 commercially deployed networks, according to data from market watcher Infonetics Research.

# India sees first FDD-LTE network on 1800MHz

 In a deal that marks India's first FDD-LTE deployment using 1800MHz spectrum, Bharti Airtel has commissioned Nokia Networks to expand its 4G services to six new circles.

The deployment includes the rollout of small cells to improve capacity and coverage in dense areas, and will use the vendor's *Flexi Zone BST* which is claimed to be the world's smallest high capacity LTE picocell. Nokia will also supply its *Flexi Multiradio 10 BST* which it describes as a software-defined radio platform that can be flexibly configured



Airtel and TATA are both using Nokia's software-defined *Flexi Multiradio 10 BST* to expand their data networks in India.

to increase network capacity depending on data consumption.

In addition, Bharti will take advantage of the Finnish company's professional services such as network

planning, optimisation and implementation, hardware care, and cloud-ready *NetAct* system for consolidated management and monitoring of its LTE network.

In a separate deal, Nokia is also helping TATA DOCOMO expand its 3G network in India with an upgrade to HSPA+ in Karnataka, Haryana and Punjab. TATA will also use a *Flexi Multiradio 10 BST* with HSPA+ technology and radio network controllers, along with Nokia's *Flexi Lite* base stations for enhancing capacity and providing best coverage in densely crowded areas.

## TE provides coverage at the Superbowl

 A distributed antenna system (DAS) from TE Connectivity scored big time at the 49th National Football League (NFL) championship game held in the US during February.

The vendor's *FlexWave Spectrum* was deployed at the University of Phoenix Stadium to support crowds at the big game. It provided 48 sectors of mobile coverage and capacity for a neutral host provider serving the nation's four largest mobile operators.

The installation included 96 main hubs, 49 expansion hubs, and 225 remote antenna units to cover the stadium bowl, luxury boxes and service areas.

TE says its system supports various cellular frequencies including 700MHz, 800MHz, 850MHz, 1900MHz and 2100MHz LTE, CDMA, EVDO and UMTS.

In the Glendale area, where the stadium is located, TE equipment was used to link a base station hotel with a DAS in the Renaissance Hotel and the Gila River Arena, making use of existing operator infrastructure to manage capacity spikes.

In downtown Phoenix, TE's *FlexWave Prism* DAS was deployed at the Hyatt Regency Hotel, which served as the headquarters for NFL executives in the month leading up to the game, and at CityScape, an

outdoor visitor centre. Elsewhere, the company's *FlexWave Spectrum* DAS which features a CPRI digital interface unit (CDIU) was deployed at US Airways Arena, used as the event's media centre.

In addition, TE says its "unique" host-to-host technology was used to link a 'base station hotel' in downtown Phoenix with the US Airways Arena, the Hyatt Regency, Chase Field and the Phoenix Convention Centre.

The company says its host-to-host technology transports base station signals for miles over a digital fibre link between the base station hotel and the various venues.

## Hytera TETRA helps secure UN conference

 A TETRA system from Hytera provided secure communications to police and safety agencies guarding the UN conference on climate change held in Peru last year.

The 20th Conference of the Parties (CoP20) was attended by representatives of 195 countries and international organisations, along with approximately 15,000 visitors.

In Lima, Hytera deployed 14 *TETRA 2 DIB-R5* advanced sites and a geographically redundant IPN to provide secure voice and data communications. Additionally, two mobile communication control centres equipped with a rapid deployment

*DIB-500 R4.1* TETRA base station, a remote operation control centre, and *300 PT580H* Hytera portables were strategically installed at the Army General headquarters.

Further, Peru's national police were equipped with more than 3,500 *PT580H* terminals, over 600 *MT680* mobile terminals installed in patrol vehicles, and 300 police stations were supplied with a fixed *MT680* terminal which operated during the event.

To improve the response times in case of an emergency, Hytera also installed seven distributed operation control centres across Lima with applications like AVL-GIS TETRA



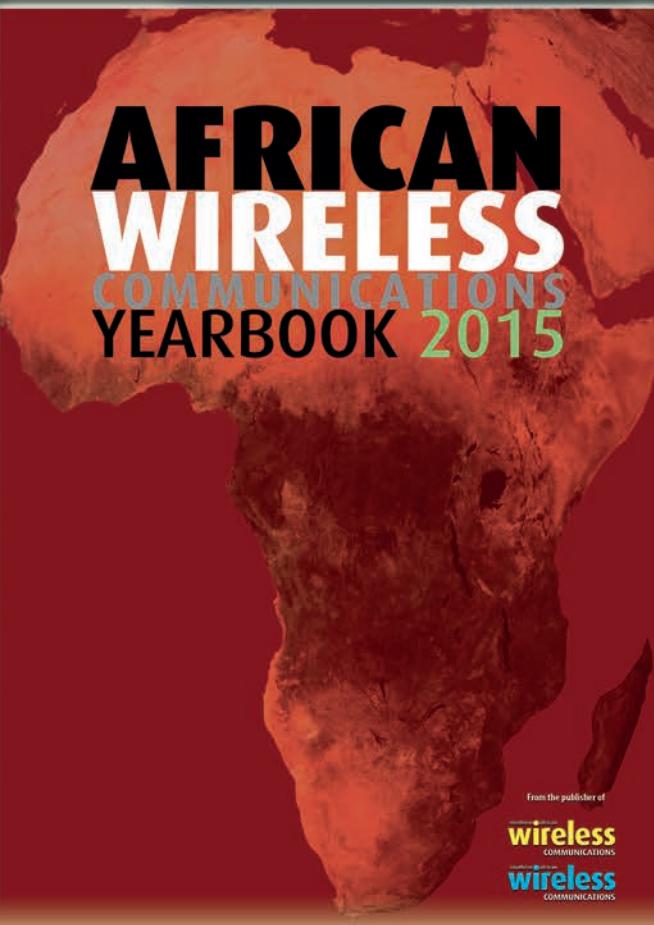
A police officer using a Hytera terminal across the secure comms network.

dispatcher, and an integrated CCTV that interconnected with the Main Emergency Control Centre equipped with more than 60 of the vendor's *APD* dispatcher consoles.

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