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northern african wireless COMMUNICATIONS

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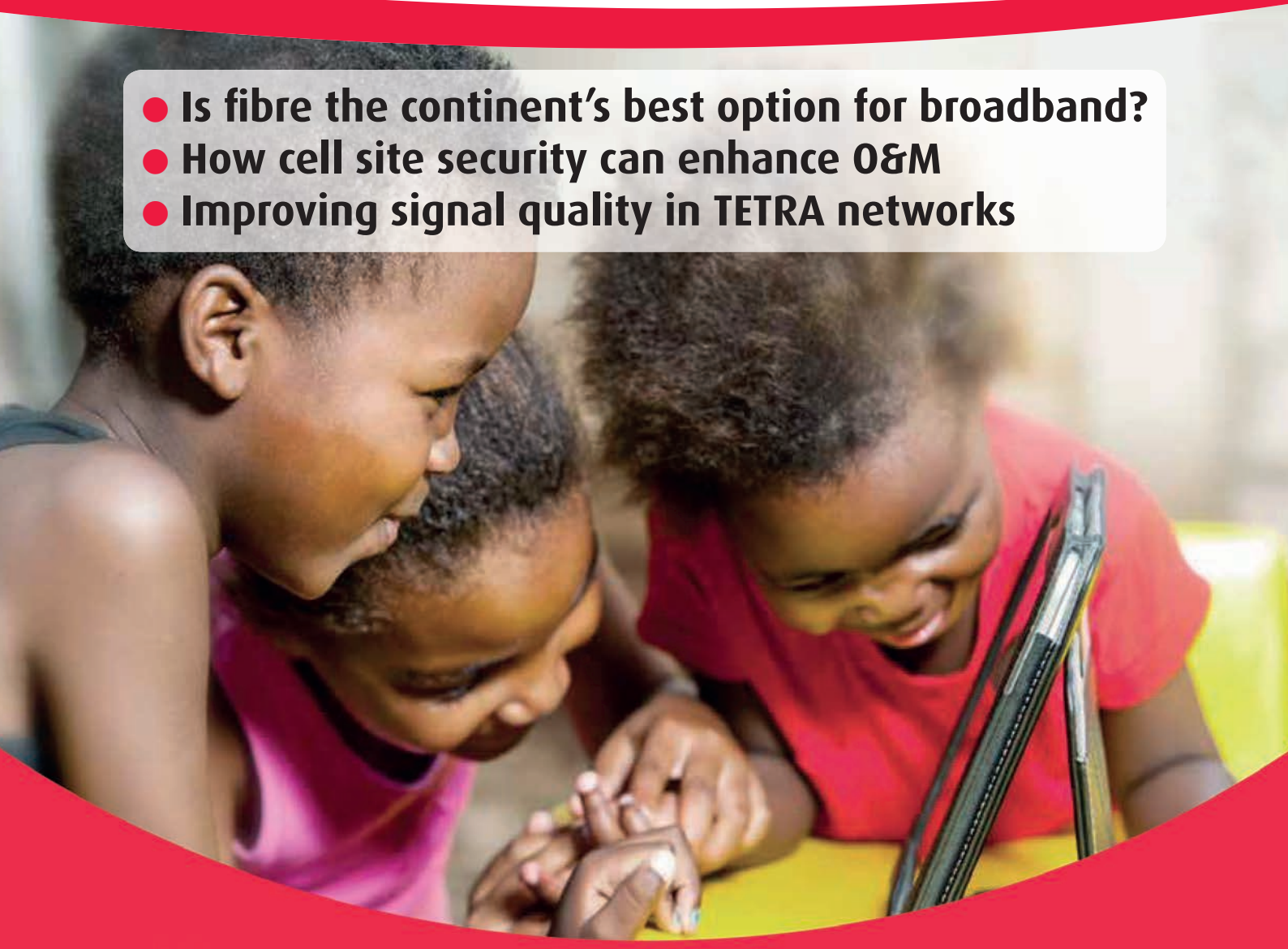
- Improving signal quality in TETRA networks

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Gemalto claims it's secure despite state-sponsored hacking revelations

Digital security specialist Gemalto says it had no prior knowledge of US and UK intelligence agencies hacking its SIM cards following revelations published on the *Intercept* website in mid-February.

According to the report, during 2010 and 2011 operatives from the US National Security Agency (NSA) and the UK's Government Communications Headquarters (GCHQ) hacked SIM card encryption keys engraved in Gemalto's and possibly other vendors' SIM cards.

Citing former NSA IT contractor and whistleblower Edward Snowden as its source, *Intercept* said the intelligence agencies had "the potential to secretly monitor a large portion of the world's cellular communications, including both voice and data".

KuppingerCole senior analyst Alexei Balaganski claims the intelligence agencies did not just resort to hacking, but also ran a global surveillance operation on Gemalto's employees and partners.

"In the end, they managed to obtain copies of secret keys embedded into SIM cards that enable mobile phone identification in providers' networks, as well as encryption of phone calls," writes Balaganski in a blog. "Having these keys, NSA and GCHQ are in theory able to easily intercept and decrypt any call made from a mobile, as well as impersonate any mobile device with a copy of its SIM card."

Neither agency has so far commented on the allegations.

Netherlands-based Gemalto is said to be the world's largest SIM maker, annually shipping more than two billion cards globally. In Q314, it reported total revenues of EUR626m (USD707m) of which its mobile division accounted for EUR331m (USD347m).

Following its own investigations, Gemalto said that there are "reasonable grounds" to believe a joint surveillance operation by the NSA and GCHQ (pictured) "probably happened" during 2010 and 2011.

In Africa, Etisalat, MTN, Safaricom, Vodacom and Morocco's Inwi are among the mobile operators that use the firm's products, while governments in several countries including Algeria, Kenya and South Africa have deployed its digital security solutions. Total earnings from Gemalto's ongoing operations across the MEA region are worth EUR273m (USD308m).

"An onion and an orange"

Following the revelations, Gemalto quickly launched an investigation and published its findings on 25 February. It said that there were "reasonable grounds" to believe that an operation by the NSA and GCHQ "probably happened". But it added that the attacks only breached its office networks and could not have resulted in a massive theft of SIM encryption keys.

"The operation aimed to intercept the encryption keys as they were exchanged between mobile operators and their suppliers globally. By 2010, Gemalto had already widely deployed a secure transfer system with its customers and only rare exceptions to this scheme could have led to theft.

"In the case of an eventual key theft, the intelligence services would only be able to spy on communications on 2G mobile networks. 3G and 4G networks are not vulnerable to this type of attack," claimed the firm.

It confirmed that it did experience many attacks during 2010 and 2011, including "sophisticated intrusions" and several attempts to access the PCs of employees who had regular contact with customers.

"At the time we were unable to identify the perpetrators but we now think that they could be related to the NSA and GCHQ operation. These intrusions only affected the outer parts of our networks – our office networks – which are in contact with the outside world. The SIM encryption keys and other customer data in general, are not stored on these networks.

"It is important to understand that our network architecture is designed like a cross between an onion and an orange; it has multiple layers and segments which help to cluster and isolate data."

According to *Intercept*, the intelligence agencies targeted mobile operators in Afghanistan, Yemen, India, Serbia, Iran, Iceland, Somalia, Pakistan and Tajikistan. Gemalto said it has never sold SIMs to four of the 12 operators listed in the documents, in particular to the Somali carrier where a reported 300,000 keys were stolen. In the case of Pakistan, it confirmed that the transmission of data between its employees and operators in the country used the highly secure exchange process at that time.

Gemalto concluded by saying it will continue to monitor its networks and improve its processes.

Meanwhile Giesecke & Devrient (G&D), which is also one of the world's biggest SIM card makers supplying more than 350 operators globally, says there is no indication that it has suffered any similar hacks.

Carolina Kehrer, a spokesperson for the German-based manufacturer, said: "As a leading provider of security solutions and services, we take every precaution to protect customer confidentiality. Our data generation takes place in high-security areas, isolated both physically and virtually from the surrounding company network. We monitor the security and integrity of these separate areas on an ongoing basis."

Intelsat and Azercosmos team up for new satellite

Intelsat and Azercosmos will work together to build a new satellite that will orbit at 45°E.

The two firms say they will "leverage their respective strengths and capabilities" during the manufacturing and development phases for *Azerspace-2/Intelsat 38* which is expected to launch in 2017. The new satellite will cover Africa, Asia and Central and Eastern Europe.

For Intelsat, it will also provide continuity of service for *IS-12* which is currently at 45°E and provides DTH platforms and connectivity for corporate network services in Africa.

Azercosmos is the national satellite operator of Azerbaijan. It will use *Azerspace-2* for enhanced capacity and coverage to support the growing demands in the region for DTH, government and network services currently offered by *Azerspace-1*. "With our second telecommunications satellite, we will be in a stronger position to meet the increasing demand for broadband and media applications," says Azercosmos CEO Rashad Nabiyev. "Our partnership with Intelsat will further strengthen both of our positions in the region and provide the necessary capacity to efficiently expand our services geographically."

Intelsat adds that its tie-up with Azercosmos is a "great example" of working closely with other satellite operators. "Our collaboration will enable us to create additional capacity by leveraging our existing assets and maximising the value of our orbital rights," says deputy CEO Stephen Spengler.

Satellites help to investigate climate change in Africa – news p8.

The shipping container that holds community communications

Ericsson and Coca-Cola will work on a pilot project to bring mobile connectivity to *EKOCENTER*, a social enterprise initiative designed to bring safe water, solar power and mobile communications to under-served communities. The project will be carried out with Tigo Rwanda and German start-up Solarkiosk.

Coca-Cola is partnering with Solarkiosk to roll out *EKOCENTER* in six countries in Africa and Asia in 2015. The modular kiosks will be run by local women entrepreneurs, and serve as a community centre where people gather and have access to free and fee-based connectivity services.

Coca-Cola has been testing its solar powered *EKOCENTERs* in Africa with the help of partners that include Qualcomm and IBM.

Ericsson will provide a number of its products for the *EKOCENTER* in rural Rwanda. It will initially deploy its *Managed Rural Coverage* solution to provide internet services, and will also offer its *TV Anywhere* service to enable access to education and healthcare content as well as 'infotainment' capabilities. In addition, the company will provide its *M-Commerce* solution so that people at the centre can make transactions using their mobile wallets.

Based on the success of the implementation, Ericsson says it will potentially incorporate its services at additional *EKOCENTER* locations.

In 2013, Coca-Cola began testing its *EKOCENTERs* in Africa at a site in Heidelberg, South Africa, with the help of partners that included Qualcomm and IBM.

Housed in a shipping container, the solar powered kiosk primarily aims to supply safe drinking water to rural areas using the *Slingshot* water purification system developed by DEKA R&D. This utilises vapour compression distillation technology to turn nearly any source of dirty water into safe drinking water.

Supporting economic growth through mobile broadband

The GSM Association will work with the governments of Egypt and Rwanda to support economic growth through mobile broadband.

In February, the National Telecommunications Regulatory Authority of Egypt (NTRA) and the GSMA announced an agreement to establish a framework of cooperation designed to promote Egypt's mobile economy.

NTRA EVP Hesham El Alaily said: "The MoU signed with the GSMA reflects our intention to develop a supportive regulatory environment that is based on international best practices and aimed at attracting long-term investment in mobile network infrastructure and services in Egypt."

The GSMA believes collaboration between the public and private sectors is the only way it can drive access to affordable and ubiquitous mobile services amongst consumers.

It says the agreement with the NTRA employs a multi-faceted approach that will address both the supply and demand sides of Egypt's mobile market. The two organisations will work together to develop best-practice recommendations on spectrum licensing and infrastructure sharing, and promote mobile-enabled services for digital and financial inclusion, including e-government and mobile money.

Earlier in February, the GSMA also announced a series of initiatives with the Rwandan Ministry of Youth and ICT. It aims to support the country's ambitious digitisation agenda which ranges from promoting a cashless economy and a paperless government, to extending broadband to all citizens and enabling digital literacy and innovation.

According to GSMA research, while there were 7.7 million mobile connections and 4.2 million unique subscribers in Rwanda at the end of 2014, just nine per cent of the population were unique 3G/4G mobile internet users. This number is expected to almost triple to 24 per cent by 2020.

Vodafone launches 'school in a box' for refugee camps

The Vodafone Foundation has launched a digital 'school in a box' that aims to bring tablet-based teaching to refugee camps.

Instant Classroom is shipped in a robust 52kg case containing a laptop, 25 tablets pre-loaded with educational software, a projector, a speaker and a hotspot modem with 3G connectivity.

The Vodafone Foundation says the system takes 20 minutes to set up and has been specifically designed for areas where electricity and internet connectivity are unreliable or non-existent.

All the components can be charged simultaneously from a single power source while the case is locked.

Instant Classroom is easy to transport and is ready to use in around 20 minutes.

After 6-8 hours of charging time, Vodafone says the *Instant Classroom* can be used for a full day. The tablets connect to the laptop locally, enabling teachers to deliver content and applications to students without the need to access the internet.

Over the next 12 months, the system will be deployed in partnership with the UNHCR to 12 schools in refugee settlements at Kakuma in Kenya, Nyarungusu in Tanzania, and in DRC's Equatorial Region. It will provide up to 15,000 children and young adults aged from seven to 20 with advanced teaching aids that are currently only available in a minority of schools in developed nations.

The *Instant Classroom* builds on the Vodafone Foundation's *Instant Network Schools* programme which introduced tablet-based learning to around 18,000 pupils in the Dadaab refugee camp in Kenya last year *(see News, Oct-Nov 2014)*.

Over the next two years, there are plans to extend the programme to support more schools in settlements in Kenya, Tanzania and the DRC, to reach more than 40,000 young people.

Samsung launches Smart School in Senegal – News p10.

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Klif promises to put the mobile internet into the hands of millions

Orange is claiming a breakthrough with the launch of *Klif*, a new smartphone aimed at Africa and the Middle East that is priced from USD40. The operator reckons the device, which uses Firefox's latest OS, will put the mobile internet within reach of millions more people who were not previously addressed.

Klif will be available from Q2 in thirteen of Orange's markets in the region. In Africa, they include Egypt, Senegal, Tunisia, Cameroon, Botswana, Madagascar, Mali, Côte d'Ivoire, Niger, Kenya and Mauritius. Starting prices include data, voice and text messaging.

The smartphone will also provide access to a range of content, including established Orange services like the *Star Africa* entertainment portal, *Orange Football Club*, and partner services like *Dailymotion*, the video sharing service.

Local content – such as the *Ndamli* sports portal in Senegal and *Anghami*, a music catalogue service featuring millions of Arabic and international songs – will be readily available. Users will also have access to thousands of apps from the *Firefox Marketplace*.

The device itself features a 3.5-inch HVGA screen, two megapixel camera, and a1300mAh battery that promises around 810 hours on standby.

"Although the smartphone revolution is well under way across the African continent, there remains a proportion of the population that so far has been underserved, not just because of the cost of handsets, but because of concerns about data costs," says Yves Maitre, EVP of connected objects and partnerships, Orange. "By scooping up all the costs into one incredibly priced digital offer, we hope that critical access to the mobile internet, and all the opportunities that that opens up, will be within reach of many more people."

Orange's *Klif* smartphone will be available from Q2. Its USD40 starting price includes data, voice and text messaging.

Liquid helps Kenya launch its first free public Wi-Fi

Liquid Telecom Kenya has partnered with the Nakuru County Government to launch an outdoor Wi-Fi network which the public can access for free.

Liquid designed and launched the network which covers a 10km radius from the central business district. The network is currently connected to a 200Mbps pool but is upgradable to 1Gbps depending on demand.

Fifty-one nodes have been installed around strategic points in the town's busiest areas. The first phase of the project covers Kenyatta Street, Marikiti Market, the central bus terminal, Afraha Stadium, academic institutions, the county headquarters and the Westside Mall. A second phase is expected to cover Naivasha and Gilgil towns, more streets using poles and other public infrastructure,. as well as Egerton University in Njoro, which will be connected later in 2015.

Liquid says its main consideration when designing the network was to ensure adequate capacity and seamless connectivity. Its outdoor Wi-Fi nodes use built-in meshing technology, and also have the ability to withstand harsh climatic conditions to guarantee maximum and uninterrupted speeds.

Liquid Telecom Kenya has so far invested USD400,000 in the Nakuru project, with more set to be invested during network optimisation exercises during this year.

Satellites investigate climate change in Africa

An international research team has used satellite technology to map the continent south of the Sahara, and has discovered that many areas receive drastically different amounts of rainfall today compared to just ten years ago.

The new concept developed by the team interprets satellite observations of rainfall and vegetation greenness at the same time. Satellites can fill in the gaps in weather observations in Africa where meteorological stations are far and between. The researchers used a rain dataset that is produced by the US National Oceanic and Atmospheric Administration's Climate Prediction Centre and combined the best qualities of local rain gauge stations with 10 years of satellite data.

Their study suggests that areas such as the Congo, Nigeria and Madagascar now receive far less rainfall than they did a decade ago, while other locations such as the Sahel zone have become far greener through increased rainfall.

The findings highlight areas where climatic changes are the likely cause of greener or browner vegetation. More rain can lead to a 'greening up' of large regions, as was the case in the West African Sahel zone. If rains become scarcer, in dry areas the plants cannot green as much. This effect is large enough to be observed from satellite.

CETel to cover Africa using extended C-band via Arabsat

Arabsat and CETel have built an Earth station which uses a 9.3m antenna at CETel's teleport in Germany.

CETel has launched services using extended C-band capacity in partnership with Arabsat. The two firms have jointly built an Earth station at at CETel's teleport in Germany, and it's claimed their new services will offer "unprecedented business expansion possibilities".

CETel will use *Arabsat-5C* which orbits at 20°E along with its own teleport facilities and services across Africa, the Middle East, Europe and Central Asia.

Arabsat and CETel say extended C-band offers not only trunking and backhauling applications but also corporate network connectivity between regions and continents. They add that their strategic plan to expand into these frequencies is driven by the need for cost-effective communications solutions in rural areas.

Arabsat president and CEO Khalid Balkheyour says: "Service providers' ever increasing demand for capacity is satisfied by development of the extended C-band which gives wider room for expansion, not available anymore on congested normal bands."

While C-band frequencies generally operate at around 4.2GHz to 6.6GHz, extended C-band on *Arabsat 5C* is about 6,425MHz to 6,675MHz (uplink), and 3,404MHz to 3,636MHz (downlink).

CETel says it will use this spectrum to complement its existing "service-proven" portfolio of satellite enabled communications solutions. According to the company, customers will benefit by using an optimal mix of the different bands to meet their specific requirements over Africa.

Multibank mobile money network in Ethiopia

Lion International Bank and Somali Micro Finance have begun testing their *HelloCash* mobile money services in Ethiopia. In February, the two banks launched a pilot in partnership with BelCash Technology Solution, an Ethiopian-based technology service provider for the financial industry.

HelloCash aims to provide mobile banking services to all Ethiopians. It enables existing and potential customers of Lion International and Somali Micro Finance to use their mobiles for deposits, withdrawals, transfers and payments. The service has been developed in compliance with the National Bank of Ethiopia's strict directives on mobile money.

The pilot is currently under way in three parts of the country with locations comprising a mixture of authorised agents and bank branches.

It's claimed that one of *HelloCash*'s unique aspects is its interoperability and shared infrastructure features. It is designed to interconnect multiple banks and microfinance firms, enabling them to offer mobile money services to their respective customers.

Partnering financial institutions are therefore able to share each other's agent and branch networks. BelCash says this allows partners to optimise their investments as well as increase nationwide service coverage.

Lion International Bank and Somali Micro Finance say they will be able to build a unique network of more than 20,000 agents across all Ethiopia within the next three years. BelCash adds that this is only the beginning of what is an "irreversible step" to reinforce financial inclusion in the country.

Analogue TV screens go blank in Kenya

Kenya has begun switching off analogue TV signals ahead of the international deadline of 17 June – but the transition has not been smooth.

At the end of last year, analogue signals were switched off first in Nairobi and its environs, and early February saw phase two which included Mombasa, Meru, Webuye, Nakuru, amongst other regions. The Communications Authority of Kenya (CAK) said that all other remaining sites would be switched off by the end of March.

Some media houses in the country have criticised the move, saying the Government has forcibly switched off analogue frequencies. For instance, Nation Media Group, Standard Group and Royal Media Services have not migrated to a digital platform. This prompted a Supreme Court ruling on 13 February stating that the switch-off dates would remain as scheduled.

The following day, CAK said it had to take "necessary regulatory action" to switch-off the three broadcasters' analogue signals. They then withdrew their content from the digital platform.

In an online statement, CAK said: "The Supreme Court ruled that the timelines agreed on for the phased switch-off remain valid. The enforcement action taken by the Communications Authority of Kenya on 13 February was therefore mere enforcement of the ruling for non-compliant media houses."

It added that the three media houses were able to air their broadcasts through the currently available digital networks, SIGNET, PANG and DStv, but willingly chose to withdraw their content from these platforms.

CAK said: "These [platforms] have even a wider reach than the analogue transmissions the media had before. KTN, NTV, QTV and Citizen TV only had 11 analogue transmission stations collectively, which was a very small proportion of what the digital network coverage currently offers."

Switching-off analogue TV signals releases the so-called 'digital dividend' frequencies. Regulators can then re-assign this spectrum to, for example, for mobile operators.

MTN launches mobile TV in Côte d'Ivoire

MTN has set up a mobile TV service in Côte d'Ivoire. Subscribers can use their smartphones or tablets to download the *MTN TV* app and access a set of live TV channels as well as on-demand content. They have the option to subscribe for a day, a week or a month.

The first five international channels accessible on *MTN TV* include FRANCE 24, Al Jazeera, TRACE AFRICA, BBLACK and TIJI.

MTN's service is built on a platform developed by SUMMVIEW. The France-based firm has a particular focus in Africa, and specialises in the development of applications and multimedia services for smartphones, tablets, connected TVs, IPTV and OTT distribution.

Subscribers in Côte d'Ivoire can now access five international channels using the new *MTN TV* service.

In order to offer its customers a white label solution, SUMMVIEW say it has set up end-to-end infrastructure for the optimised distribution of live or on demand content across all mobile operating systems. It says this 'one stop shop' enabled MTN to control the costs of its service and secure its rollout.

"[Our] *Content Delivery Solution* is an SaaS platform designed to meet the specific needs of each client," says SUMMVIEW CEO Denis Pagnac. "It allowed MTN Côte d'Ivoire to propose its own mobile video service, while benefiting from the expertise of SUMMVIEW in the field of the distribution of video content on mobile phones."

GeoPoll and Control Union will use mobile surveys to engage and educate farmers in emerging economies, starting with Africa.

Educating farmers via SMS surveys

Control Union will use a real-time, mobile survey platform to help educate farmers in Africa.

The company, which specialises in agricultural certifications, food safety and sustainability, will deploy GeoPoll's multimodal mobile platform and database of 200 million users. It says this will give it access to what's claimed to be the fastest and most cost-effective data collection method available in emerging markets.

Together, GeoPoll and Control Union will use mobile surveys to engage and educate smallholder farmers in emerging economies, with the goal of reaching a million farmers by 2020 via SMS and voice messaging.

The partnership will allow commercial organisations such as global brands, exporters and suppliers, as well as governments and non-profit firms, to ensure social compliance in key value chains. Control Union says it will also give farmers greater access to markets, ultimately adding value for both them and consumers.

The two companies will launch several mobile survey tools. These aim to: monitor farmers' compliance with programmes such as Global GAP and Organic certifications; support sustainable value chain design and the monitoring of social, economic and ecological impact; promote agricultural compliance via one-way push content messages; and enable clients to collect mobile data through customised questions which will inform and enhance their operations in local markets.

The partners will initially focus on Ghana, Kenya, Nigeria, Ethiopia, Tanzania, and Uganda, expanding to key markets in Asia later. Target value chains include coffee, cocoa, cotton, palm oil, rice, tea, tobacco, and fresh fruits and vegetables.

RSCC preps *Express-AM8*

The Russian Satellite Communications Company's *Express-AM8* satellite has been delivered to the Baikonur Cosmodrome in Kazakhstan, and is currently being processed for launch. At the time of writing, lift-off was scheduled on board a *Proton-M* with *Breeze M Upper Stage* rocket for late May. The satellite – manufactured by ISS Reshetnev Company in conjunction with Thales Alenia Space – will provide communications and broadcasting services in C-, Ku- and L-bands in Africa, the Middle East, Europe and Latin America.

LTE Phase II in Algeria

ZTE has signed a deal to build Algeria Telecom's LTE Phase II project. This is the second time the vendor has worked with the telco following its LTE Phase I project, with the first purchase order for Phase II covering 14 provinces in the north east region. Algeria is the second country in this part of Africa to offer commercial LTE services, having launched its Phase I project in April 2014 with the added help of Nokia Networks (*see News, Jun-Jul 2014*). 4G services based on LTE are also available in the region from Smile Communications in Nigeria.

New *M-PESA* corridor

Vodafone has rolled out its first money transfer corridor between Tanzania and Kenya. Its *M-PESA* service taps into a combined network of 180,000 agents across the two countries. Vodafone says the cost of transferring money via traditional channels can be up to 31 per cent of the transaction. By comparison, it says that using *M-PESA* to transfer USD50 across the Tanzania-Kenya border will cost around one per cent of the transaction plus a foreign exchange fee.

Samsung sets up Smart School in Senegal

The Senegal Ministry of Education and Samsung Electronics Africa have unveiled a mobile education solution to provide an advanced and interactive classroom experience for learners.

Installed at the Plan Jaxaay Secondary School in Dakar, the *Smart School* integrated platform enables teachers to monitor, control and keep track of educational content on their pupils' screens, a screen-sharing feature, and a real-time question-and-answer feature.

Samba Guisse, IT advisor at the Ministry of National Education's HR department, says: "The future of education is about accessing information and collaborating locally and globally. Teaching and learning has become social; this has become possible with the emergence of initiatives such as the Samsung *Smart School*."

Launched in the country in partnership with Millennium Connect Africa, Samsung says its *Smart Schools* are part of its "far reaching" African citizenship programme which is designed to positively impact the lives of Africans.

Smart Schools have also been installed in other countries on the continent, such as the DRC, Kenya, Mali, Rwanda, South Africa and Sudan.

In pilot projects of its *Smart Classroom Solution* elsewhere in the world, Samsung has been supplying teachers and entire classes with their own personal devices, and has provided a complete digital education package consisting of tablets, a server and software. For these projects, the school software suite includes Samsung's *Interactive Management Solution*, a mobile Learning Management System, and a Student Information System.

Samsung says its Corporate Citizenship arm has always supported the development of education with the view of impacting society and the economy.

Samsung's technology has been deployed at the Plan Jaxaay Secondary School and enables teachers to share screens with their pupils.

"We believe that access to technology can create new learning possibilities for students, paving their way towards lifelong learning and personal development in order to acquire the knowledge and skills needed in today's society," says the firm.

SPOT to keep track of extreme race

Organisers of what is described as "the world's most extreme running race" – the Marathon Des Sables 2015 – have selected Globalstar Europe Satellite Services to track and protect all participants in this year's 11-day, 250km foot race from Morocco to France.

Globalstar, a provider of satellite messaging and emergency notification technologies, says its *Spot Gen3* safety device has been chosen for the 30th edition of the multi-stage endurance test, in which 1,450 runners will take part.

SPOT Gen3 is a pocket-sized personal GPS messenger that helps users stay connected via satellite even where there is poor or no GSM signal. The firm says its device is rugged enough to withstand the rough conditions of the race.

Globalstar's *Spot Gen3* will be issued to all 1,450 participants and used to constantly track and locate them.

The event organisers and emergency support services will be able to use *Gen3* to precisely track each runner's location on a "user-friendly" display showing GPS positions in real-time via geolocation platform *Dreamap*.

At the press of a button, any runners who get into trouble can instantly transmit their GPS co-ordinates to alert the emergency services so that rescue workers can be dispatched to their location.

Globalstar adds its device also offers off-the-grid messaging, extra long battery life, and GPS tracking check points capable of taking place as frequently as every 150 seconds.

Kirusa helps Vodafone Ghana fight Ebola

Vodafone Ghana Foundation has launched the Ebola Public Health Project using a platform from emerging markets voice and social media solutions specialist Kirusa.

The project will disseminate content on the Ebola outbreak to Vodafone subscribers for free. Kirusa's platform will also support incoming calls from outside the operator's network as well as international sources to retrieve the same content, which will be refreshed weekly.

Nana Yaa Afriyie Ofori-Koree, head of Vodafone Ghana Foundation and Sustainability says: "The Ebola epidemic has taken a huge toll in West Africa. This is our endeavour to spread awareness amongst our countrymen and make Ghana an Ebola-free country."

The Ebola Public Health Project was developed as part of the foundation's *Mobile for Good* initiative which aims to empower Ghanaians to deploy mobile technology in a way that impacts the lives of ordinary people, socially and economically. At the launch of the project in 2009, seven applicants were awarded funds between GHS50,000-100,000 (USD13,220- 25,500) to pilot their technology projects and demonstrate its impact on people in the country.

Vodafone Ghana says the selected projects are diverse in concept, covering issues such as maternal health, HIV/AIDS, literacy, e-learning, blood donation and challenges with the emergency services.

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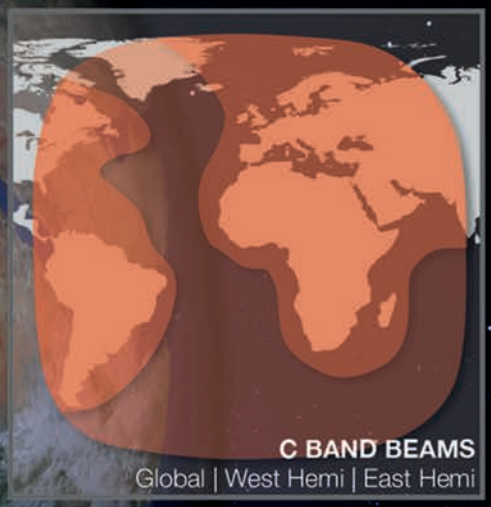

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Satellite rendition courtesy of the Boeing Company

ST-3: Reliable connectivity for Africa from Asia's leading satellite operator

Singtel now offers new and exciting opportunities for satellite connectivity in Africa.

Singtel is Asia's leading communications group and has more than 35 years of experience in the satellite business. Today, we offer an unrivalled range of customised fixed and mobile satellite services to enterprise and maritime users, broadcasters, government agencies, NGOs and more.

As well as owning and operating satellites, we also offer access to more than 30 satellites worldwide from our three teleports in Singapore that were first established in 1971. We also have partnerships with other teleports around the world for comprehensive global coverage.

ST-3 delivers high power C-band coverage across virtually all of Africa, the Middle East and South East Asia. With high performance east and west hemi beams, it provides powerful connectivity to support transponder leasing, VSATs, IP services, and much more. Its prime orbital location of 75°E makes it particularly suitable for a diverse group of services ranging from cellular backhaul and enterprise data to primary distribution of HDTV channels.

Singtel is more than just a satellite operator. We are a full telecoms service provider offering satellite capacity, submarine cable services and data centre facilities. We can integrate all of those platforms to offer a full and customised suite of unique services to customers.

For example, we are already providing some clients in Africa's mining sector with complete end-to-end services that include satellite links, connectivity to data centres, the internet and private MPLS networks, as well as LAN integration and other managed services.

With our Global Offices around the world, prospective customers in major cities can come and meet us in person to discuss their individual requirements for a tailored package of services.

And if all that wasn't enough, we have proven track record of maintaining 99.98% availability of service. We regularly upgrade our terrestrial infrastructure to ensure that our customers always enjoy high performance and reliability for their mission-critical applications, even in remote areas.

Satellite continues to play a vital role in connecting companies and communities to access areas of Africa. ST-3 offers you a cost effective way of capitalising on the technology's possibilities, as well as the unique opportunity to partner with Singtel, a company that has decades of unparalleled experience and expertise in the field.

Get in touch with us today to find out more about how we can help you to reach your target audiences.

For More Information:

Technical Assistance Centre (24hrs)
Tel: 1800 788 0022 (Singapore)
+65 6788 0022 (International)
(Select "7" on the hotline for Satellite Services)

Fax: +65 6483 4140

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Website: www.singtelteleport.com

Singtel

Let's make everyday better

SpeedCast aims to power ahead in energy sector communications

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.

CEO Pierre-Jean Beylier says the deals will enhance SpeedCast's ability to deliver end-to-end solutions to global customers.

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, 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.

■ In separate news, Inmarsat has appointed SpeedCast to its *Enterprise Global Xpress (GX)* value-added resellers programme. The company is the first *GX* VAR for Inmarsat Enterprise to come from the VSAT industry.

GX uses Ka-band to deliver what Inmarsat claims is the first superfast mobile broadband service available worldwide delivered through a single operator. It offers both fixed and MSS on a global basis, and will enable SpeedCast to expand its product offerings for customers in Africa, the Middle East, Asia and Europe.

Headquartered in Hong Kong, SpeedCast offers managed network services in more than 60 countries around the world. The firm also operates a global maritime network, and adds that it has more than 4,000 links on land and at sea supporting mission-critical applications.

Orange buys out Orascom Telecom's interests in Mobinil

Orange will purchase all the shares and voting rights held by Orascom Telecom Media and Technology (OTMT) in the Egyptian Company for Mobile Services (ECMS), the operator of the Mobinil brand in Egypt.

Orange will increase its capital stake in ECMS from around 94 to 99 per cent. The transaction will be completed through the exercise of Orange's call option under the shareholders agreement signed by the two parties in April 2012.

The overall transaction will result in the transfer of all of OTMT's direct and indirect interests in ECMS to Orange for EUR209.6m. This includes OTMT's five per cent stake in ECMS at EGP280.7 per share, and 28.75 per cent of the voting rights of MT Telecom (ECMS' holding company which is fully owned by Orange) for EUR45.8m.

Orange already has the entire funds for the deal. It adds that the transfer of OTMT's direct stake in ECMS will be completed as an "over the counter" transaction between the two main shareholders. The parties expect this to be finalised by the end of 1Q15.

Nigeria to reach 182m mobile subscribers in 2019

Nigeria's mobile subscriber base will grow to 182 million users over the next four years, according to Pyramid Research. In a recently published report, it expects the country's telecom market to generate USD10.9bn in 2019, up from a total of USD9.2bn in 2013.

Pyramid points out that although telecoms growth will be slightly reduced in 2015 as the market recovers from the large number of fixed-line disconnections, long-term expansion of the sector will not to be affected. It says this will grow at a CAGR of two per cent over the next five years, with mobile data increasing at 16 per cent up until 2019.

With an expected 182 million subscribers at the end of 2019, Pyramid says Nigeria will remain the continent's biggest market for mobile subscriptions. It adds that the country is the largest economy in Africa and will therefore play an important role in defining future mobile trends.

"Other countries in Africa are likely to follow Nigeria when it comes to mobile technology developments," says analyst Severin Luebke.

"The increasing demand for mobile data will offer service providers, as well as new entrants to the market, ample opportunity to test and grow their offerings in Nigeria."

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.

It 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* and the 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.

Evert Dudok, ADS' head of communications, intelligence and security, says: "Our partnership with SES supports our provisioning of connectivity services to mining, energy and humanitarian customers who rely on high bandwidth data and high quality voice to operate effectively in Africa.

"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."

Millicom earns a billion in Africa

Millicom says its revenues hit USD1bn for the first time in Africa as it announced its results for 2014.

Q4 revenue for the region increased by 13 per cent in local currencies to USD256m. But the company says EBITDA at USD48m declined by 17 per cent year-on-year due to unfavourable currency movements, commercial activities, and USD5m in restructuring charges.

Yearly mobile service revenue was up 10 per cent at USD227m with voice and SMS growing by eight per cent and data by 63 per cent. Earnings from mobile financial services (MFS) also rose 58 per cent to reach USD22m.

Luxembourg-based Millicom says it now has 25.3m subscribers across its six Tigo-branded operations in Africa

(Chad, DRC, Ghana, Rwanda, Senegal and Tanzania), representing an annual rise of 24 per cent. It added 1.5m new customers in Africa during Q4, mainly driven by DRC and Tanzania.

In his statement for the year, Millicom International's interim CEO Tim Pennington said: "Progress has been made in Q4 but we will continue to manage the cost base aggressively. The group leverage reached 1.9x at the end of the year; our objective remains to reduce it towards the middle of our target range of 1.0-2.0x. We expect to increase revenue in 2015 to between USD7.1bn and USD7.5bn, which will generate an EBITDA of between USD2.20bn and USD2.35bn."

Improving ICT education in East Africa

In a bid to improve the availability of ICT resources and bridge the digital divide between nations, Finland's Aalto University has teamed up with institutions in Ethiopia and Tanzania to provide the technical and educational support that can help address the challenges.

Over the next two years, a team of experts from Aalto's Department of Communications and Networking will provide a variety of educational programmes and activities at the Addis Ababa Institute of Technology's School of Electrical and Computer Engineering, and the College of ICT at the University of Dar es Salaam.

"Despite what statistics may suggest, it is important to remember that in much of Africa the number of people employed within the ICT sector is increasing," says Prof. Jyri Hämäläinen, a researcher based at Aalto University's School of Electrical Engineering. "However, the high-tech industries in these nations are small compared to Europe. They're making discernible progress, but this is being inhibited by a lack of competent personnel who can build and maintain local ICT systems and infrastructure."

Technical training in Africa recently began with hands on courses on wireless systems simulations and theoretical lectures in advanced wireless technologies. In Ethiopia, three regional universities were able to witness the lectures remotely via video link.

The initiative is part of Aalto's *ENhANCE* project which was launched in May 2013. The project has held a number of events in which delegations from the African universities have visited Finland. Senior personnel were able to view the university's facilities and gain an understanding of its relationships with local industries.

Hämäläinen says *ENhANCE*'s primary aim has been to deliver an understanding of the latest technical developments in mobile and wireless systems. "As part of this, we need to acquaint students with systems like 3G and 4G mobile networks. Ultimately, these are technologies that we hope to transfer using the framework of the project, so that participants can utilise them in their own societies to meet specific needs. The second objective is to help each country extend their industrial reach."

Eutelsat Government EMEA launched

Eutelsat Communications has set up Eutelsat Government EMEA, its new division for serving 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 portfolio

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 and maritime business segments.
27/2/14	NEC Corporation	NEC Toshiba Space Systems	All shares	NA	NTSpace will become a wholly owned subsidiary of NEC & change 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.

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
5/2/15	Suren Sooklal	MTN	Group chief business risk officer	PwC	Group audit engagement partner
10/2/15	Vince Edwards	Sepura	DMR proposals systems engineer	Hytera	System sales engineer
10/2/15	Steve Sarno	Wyless	CFO	Exa Corporation	EVP of finance & chief accounting officer
13/2/15	Gwenn Larsson	Flexenclosure	CMO	Deutsche Telekom	VP of global sales
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
20/3/15	Cher Wang	HTC	CEO	HTC	Chairperson & co-founder
24/3/15	Dov Baharav	Gilat Satellite Networks	Interim CEO	Gilat Satellite Networks	Chairman

of C-, Ku- and Ka-band satellites, and will also work in tandem with Eutelsat America Corp. EAC was established in 2001 and supports companies providing services worldwide to US government departments as well as commercial customers. Eutelsat Government EMEA will complement EAC's efforts through marketing of satellite capacity to government service providers and providers of disaster recovery and humanitarian communications in the EMEA region.

New name for MEF

The Metro Ethernet Forum is now the Mobile Ecosystem Forum (MEF).

Announcing the name change in February, the trade body's CEO Rimma Perelmuter said: "The ecosystem we work with connects all companies who deliver or enable consumer mobile services. As new sectors embrace mobile as the primary digital touch point, and innovation offers new opportunities, the Mobile Ecosystem Forum helps members to collaborate and accelerate the growth of a sustainable mobile industry that drives inclusion for all."

The 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, and Basebone CCO and MD of Africa James McNab was appointed as a director.

IN BRIEF...

Globacom has partnered with the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN), and will give its 17 million members access to grants, soft loans and capacity training programmes. The telco has also arranged special business lines to give enterprises access to better and seamless communication.

The partnership will initially run for five years with the opportunity for attractive call rates as closed user groups and a channel to advertise products and services via CBRT.

Ten per cent of the net revenues from the partnership will be given to selected enterprises who subscribe to packages.

Telecom Egypt says four million new customers will have access to its fibre network by the end of the year. The telco has almost completed the construction of its nationwide network and says almost seven million customers are already connected to it and that more than two million more have been added in the last few weeks.

TE says the fibre network is essential for the development of its infrastructure especially as it plans to provide mobile services once it is granted its long awaited license.

North Telecom will use capacity on MEASAT's *Africasat-1a* satellite to provide VSAT services across Africa. Established in 2007, North Telecom has its headquarters in Dubai with teleport connectivity in Germany, Singapore and South Korea. It works with selected partners to provide internet access solutions as well as networking, broadcasting and satellite services across MEA and Central Asia.

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. It 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 report 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 USD150 million which will 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 and Zimbabwe which will provide homes and businesses with unlimited data packages and 100Mbps – claimed to be the fastest broadband ever available in Africa.

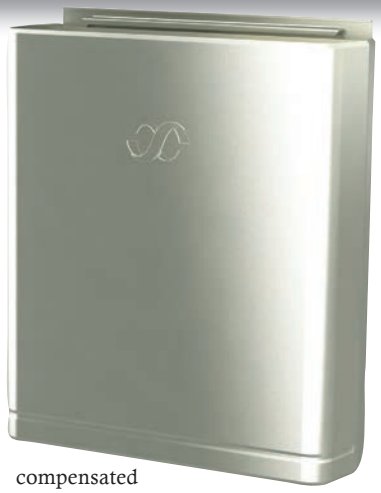
In late February, Safaricom opened its first equipment hub in the North Rift region. The KES200m facility has been set up at Kapsoya in the outskirts of Eldoret Town. The operator says it will provide space to house equipment for its expanding enterprise customer base in the region, improve quality of service to subscribers, and help reduce network outages.-Safaricom now has 11 key equipment hubs in Kenya to serve an increasing subscriber base of more than 21m customers.

The MTN Group is reportedly considering the possibility of buying a majority stake in South Africa's incumbent operator Telkom. Quoting two unnamed insiders, *Bloomberg* said in mid-February that MTN has held "exploratory discussions in recent months about a possible offer". It added that no final decision has yet been made. Neither MTN nor Telkom have reacted to the matter.

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
29/1/15	Nokia	Finland	FY14	EUR	12.7 (bn)	NA	0.14	2014 was a milestone year for the firm as it restructured under its three new divisions: Networks, Technologies & HERE.
5/2/15	Vodafone	UK	3Q14	GBP	10,881	11.9 (bn)	NA	Continued momentum in MEA & APAC but tougher conditions in Africa. Group service revenues outside Europe were GBP3.06m.
12/2/15	Singtel Group	Singapore	3Q14	SGD	4.43 (bn)	1.23 (bn)	NA	YoY revenues up 4% driven by mobile customer growth, higher equipment sales & earnings from recent digital acquisitions. In constant currency terms, revenue would have grown 7%.
18/2/15	Gilat Satellite Networks	Israel	FY14	USD	235.1	23.4	NA	Is targeting revenues of between USD255m & USD260m this year in growing markets such as HTS, mobility & backhaul.
20/2/15	SES	Luxembourg	FY14	EUR	1,919.1	1,428	1.18	Aims to capitalise on future growth with recent announcements of SES-14, SES-15 & SES-16/GovSat programmes.
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 buildouts in emerging markets.
25/2/15	Global Telecom	Egypt	FY14	USD	3.28	1.43	0.44	Djezzy revenue in Algeria decreased 6% YoY, mainly due to delayed 3G launch. YoY revenues for Mobilink in Pakistan down 1%, while Banglalink in Bangladesh is up 13%.
10/3/14	Ooredoo	Qatar	FY14	QAR	33.2 (bn)	12.9 (bn)	6.66	Group revenues down by 2%; strong performances reported in Qatar, Oman & Algeria, but challenging market conditions in Iraq, Kuwait, Tunisia & Indonesia.

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, 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.

MANUFACTURER: Eltek

PRODUCT: Chameleon power solutions

MORE INFORMATION: www.eltek.com

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.

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.

MANUFACTURER: Flexenclosure

PRODUCT: eManager

MORE INFORMATION: www.flexenclosure.com

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.

MANUFACTURER: Cummins Power Generation

PRODUCT: QSK95 Series

MORE INFORMATION: www.cumminspowerofmore.com

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.

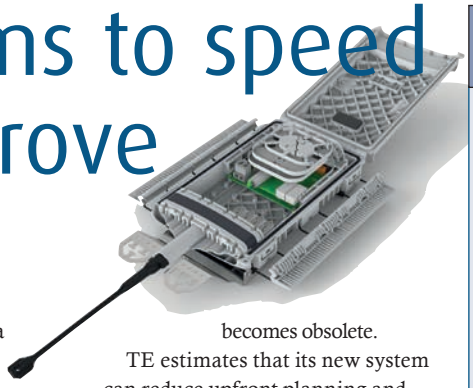
Four pre-configured kits are available: the *NWKSP1* and *NWKSP2* each offer a 15W continuous power system with six and three hours of peak sunlight respectively; while the *NWKSP3* and *NWKSP4* each have a 30W continuous power system with six and three hours of peak sunlight respectively. Customised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

MANUFACTURER: ComNet

PRODUCT: NWKSPx off-grid power systems

MORE INFORMATION: 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 – 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.

MANUFACTURER: TE Connectivity

PRODUCT: Powered fibre cable system

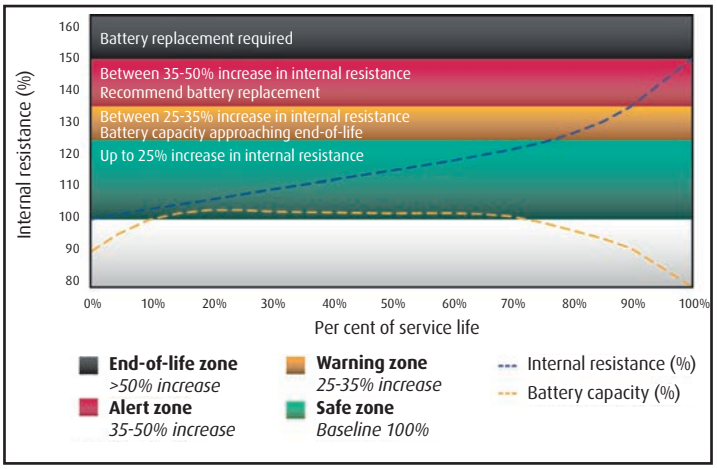
MORE INFORMATION: www.te.com/poweredfibe

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.

MANUFACTURER: Emerson Network Power

PRODUCT: Battery Optimisation Program

MORE INFORMATION: www.EmersonNetworkPower.eu/EnergySystems

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.

Angola Cables is building the world's first submarine cable system across the South Atlantic using fibre technology from NEC.
PHOTO: NEC

Finding a route to broadband in Africa

What is the best technology for delivering broadband in Africa – fibre, satellite or wireless? ABDUL MONTAQIM finds out.

Only a small percentage of people in Africa have access to broadband. While moves to connect more consumers and enterprises have been building over the years, what is the most effective method of delivering connectivity to the masses?

The ITU defines broadband as a transmission capacity that is faster than primary rate ISDN with downloads at 1.5 or 2Mbps. This definition acts as a benchmark for many in the industry, although some countries may decide that they want even faster speeds than the ITU's 2Mbps threshold.

Estimates vary as to how many people on the continent actually have access to broadband. And it should be noted that this is not the same as internet access. While around 10 per cent of Africa's 1.1 billion population have some kind of internet access, not all in that 10 per cent have broadband. ITU research suggests that mobile broadband penetration in Africa reached close to 20 per cent in 2014.

Further, the union estimates that the continent only accounts for less than 0.5 per cent of global fixed broadband subscriptions – despite having more than 15 per cent of world's population. And overall broadband penetration has remained low, at 0.4 per cent by the end of 2014.

This extremely low availability and take-up of broadband in Africa presents a huge challenge to politicians, business people and other stakeholders who want to see the continent accelerate its adoption of technology.

And it is also a pre-requisite if African nations are to meet the United Nations' Millennium Development Goals (MDGs), the deadline for which is this year. Broadband connectivity can be regarded as a fundamental part of supporting the UN's clearly stated aims of reducing child mortality, improving maternal health, and universal primary school education (*see 'UN says broadband is 'key to education for all', p20*).

Political goals

Speaking on behalf of delegates at a multinational conference a couple of years ago, South Africa's communications minister Dina Pule said Africa must do more to connect citizens to broadband. "It is undeniable and it is very clear that delivering broadband to every citizen on the continent will accelerate the attainment of the Millennium Development Goals. Our work will also assist us in identifying and closing the skills gap within our countries," she said.

Pule and other stakeholders at the conference – the inaugural ICT Indaba held in Cape Town in 2012– set a target of delivering broadband to 80 per cent of African citizens by 2020.

South Africa is by far and away the most well-connected African nation. It is comparable to most European countries and, in some cases, is even more advanced. But when you look at the continent as a whole ITU stats show that 99 per cent of people remain without broadband.

So given that the continent now has extensive mobile phone coverage, a growing number of fibre networks, and dozens of satellites pointed at it, what's the best way to get more Africans onto the broadband superhighway?

"If the political goal is to get as many people as possible connected to broadband as quickly as possible, then the answer is probably going to be a combination of technologies," says Alan Hadden, president of the Global mobile Suppliers Association (GSA). "Laying fibre is efficient in the major population centres, but if you're trying to connect everybody, wherever they are, then that implies mobility – so you need the mobile networks."

Eyal Copitt, SVP of sales for Africa & Asia & marketing, AMOS

"We believe fibre is complementary to satellite communications and acts as a business accelerator for us."

2014: the year of LTE in Africa

Hans Kolmeyer, Nokia Networks head of sales, supports Hadden's view to an extent: "LTE has truly proven itself as a medium term fibre replacement for most requirements. It is significantly quicker and cheaper to roll out, easier to maintain, results in much less disruption, provides sufficient bandwidth, quality of service and is more reliable."

He goes on to point out that while getting sufficient spectrum remains a hurdle, the "medium term battle" for broadband has been won in Africa. "For the long term, the cards may still be open, though 5G is making significant strides. One certain fact is that wireless broadband is here to stay. In Africa, we can label 2014 as the year that kick-started LTE."

LTE has now started to become established in a number of African countries, such as Angola, Côte d'Ivoire, Ghana, Kenya, Namibia, Nigeria, Tanzania, Uganda, and of course South Africa.

Some of the big name operators deploying the networks include MTN (South Africa, Uganda and Zambia); Vodacom (Lesotho and South Africa); and Smile (Nigeria, Tanzania and Uganda). Other mobile network operators rolling out LTE services on the continent include, for example, Algeria Telecom which launched in mid-2014 and Cell C which has plans for South Africa later this year.

While LTE-based broadband is all well and good, MNOs tend to initially cover the more lucrative urban areas and their rollouts are certainly not ubiquitous nor instant.

Arguably, this is where satellite comes in. Dan Zajicek, CEO of Gilat Satcom, says that while it has long been argued that the price of satellite connectivity is sometimes higher than the alternatives, its advantages remain unique: "Satellite has worldwide coverage and reaches even the remote locations; it remains operational regardless of terrestrial infrastructure; and it is durable and reliable."

As broadcasters move to digital platforms, the analogue frequencies which they previously used are freed-up. TV whites spaces (TVWS) are the 'unused' gaps in these frequencies and are being tested as a way of providing cost effective broadband, particularly in remote and rural areas. For example, last year the MyDigitalBridge Foundation worked with Microsoft and said it had successfully trialled the world's biggest TVWS project. Its network in northern Namibia covered a 9,424km² area, offering typical speeds ranging from 5Mbps to 10Mbps with the help of Adaptrum's *ARCS 2.0* TVWS radios, as shown above.

Jean Philippe Gillet, Intelsat's VP of EMEA sales, echoes this and says satellite offers the best way to deliver broadband in Africa: "The strength of satellite is its ability to effectively and cost-efficiently cover large areas, providing the means to deliver reliable broadband connectivity to everyone in Africa, regardless of location. Even wireless networks are limited in reach, but satellite expands their reach. Ubiquitous access to broadband is satellite's forte."

He adds that by reducing the capex often required with expansion via terrestrial infrastructure, network operators can concentrate on introducing

new connectivity services. "Intelsat's focus on the entire service chain results in a total lower cost of ownership for network operators and telcos, providing the opportunity for profitable revenue growth and a return on their investment."

An even more emphatic endorsement of the technology comes from Spacecom which operates the AMOS fleet. Eyal Copitt, its SVP of sales and marketing in Africa and Asia, says: "Delivering broadband through satellite has major advantages over other technologies. However, the deployment of this is very much bound up in the business decision-making process that each service provider takes to grow its business.

"The most important reasons for using satellites for broadband are time to market (much faster implementation) and cost (no need for deploying large amounts of expensive terrestrial infrastructure)."

Copitt reckons that any service provider ready to move quickly to develop and deepen its market share should choose satellite. "Satellite delivers broadband to everyone, everywhere and on time. For service providers whose customers are developing digital habits more quickly than terrestrial infrastructure can handle, stepping towards satellite is a strategic answer to keep those customers happy.

Spacecom believes Africa's deployment of more fibre is actually good for the satcoms industry. "In our view, as fibre brings additional services to more of the population, and with consumers becoming accustomed to improved and advanced services, overall demand for these services keeps growing," says Copitt.

"In Africa, this includes consumers from all areas of the continent including those only reached by satellite. In other words, demand created by fibre raises up the entire industry in Africa and we believe that fibre is complementary to satellite communications and acts as a business accelerator for us."

Fibre: the "true 4G experience"

"Africans will only be able to get a true 4G broadband experience with fibre," claims Nic Rudnick, CEO of Liquid Telecom "Patterns across the rest of the world show that the only way to enjoy the true internet/broadband experience is through fibre, even if you access through Wi-Fi or LTE/4G or WiMAX."

Nic Rudnick, CEO and founder, Liquid Telecom Group

"Patterns across the rest of the world show that the only way to enjoy the true broadband experience is through fibre."

The development of fibre-based broadband will depend in large part on how the undersea cables – which continue to be laid down and make landfall – are developed. The points at which they land will develop first, with broadband and other services available to all in those areas. But how far inland it all goes depends largely on political will and private investment. At least 33 countries on the continent currently have ongoing terrestrial fibre optic cable projects.

There are at least 27 locations on the west coast of Africa, and around 20 on the east and north coasts, where the subsea cables have come on land. They include the now well-known systems from ACE, SEACOM, EASsy, amongst others, and will soon include SACS – the South Atlantic Cable System that Angola Cables will build. SACS will be the first submarine cable running under the South Atlantic to directly connect Africa and Latin America. Angola Cables has commissioned technology from NEC as part of the deployment (*see News, p10*).

Another big name submarine fibre system for the continent is WACS (West Africa Cable System). Built by Alcatel-Lucent, WACS became operational in mid-2012 and currently connects 12 locations along its route from South Africa to the UK. It has landing points in Angola, Namibia, DRC, Republic of Congo, Cameroon, Nigeria, Togo, Ghana, Côte d'Ivoire, Cape Verde, Canary Islands and connects Africa to Europe via Portugal.

"Broadband is the big driver here in Africa," says Daniel Jaeger, Alcatel-Lucent's MEA VP. "Access depends very much on where you are. Fixed is a bit of a minority programme in Africa because not many countries have a fixed network infrastructure. South Africa would be one of the exceptions.

"All the fixed networks that are happening in the background that are not visible to the end user, are starting with the submarine cables and then going on to the big, pan-African and national terrestrial backbones.

"Any kind of networks that are needed to get the capacity or the global connectivity that arrives through the submarine landing point, then goes through terrestrial backbones and comes closer to the user before it comes to the access part."

UN SAYS BROADBAND IS 'KEY TO EDUCATION FOR ALL'

The UN Broadband Commission for Digital Development says the availability of mobile phones, tablets and e-readers with broadband connectivity is the key to making education available to all.

According to a report by the commission's working group on education and led by UNESCO, a lack of resources remains critical. For instance, it said that if an average of eight children share each classroom computer in OECD nations, teachers in Africa can struggle to share each computer among 150 or more pupils. But with increasingly sophisticated mobile devices now packing more computing power, the commission believes broadband-connected personal wireless devices are the solution.

"Every day, everywhere, women and men are inventing new ways to use broadband, mobile telephones and computers to be empowered, more autonomous and free," said UNESCO director-general Irina Bokova. "We need to tap this inventiveness to improve education, especially for girls and women. But we have a long way to go. Two thirds of illiterate adults are women, and two thirds of the world's out-of-school primary-age children are girls. This is a huge injustice, and a gap that we must fill. The continued expansion of broadband combined with technology can help us make giant strides towards this."

ITU figures show that mobile broadband is the fastest growing technology in human history, and active subscriptions now exceed 2.1bn – three times higher than the 700m fixed broadband connections worldwide. The UN said most of this progress has taken place in the developing world which has accounted for 90 per cent of global net additions for mobile cellular and 82 per cent of global net additions of new internet users since early 2010.

ITU secretary-general Houlin Zhao said: "Mobile broadband gives us the chance to truly bring education to all, regardless of a person's geographical location, linguistic and cultural frameworks, or ready access to infrastructure like schools and transport. Education will drive entrepreneurship, especially among the young – which is why we must strive harder to get affordable broadband networks in place which can deliver educational opportunities to children and adults."

Rwandan President Paul Kagame, who co-chairs the commission, believes broadband should be regarded as a basic utility, like water and electricity. "In Rwanda, investing in ICTs has been indispensable to the attainment of our development goals. Broadband enables business and social entrepreneurs to find ways to offer world class education at low cost, to populations that have never had access. Broadband technology can enhance public administration efficiency and accountability to citizens, no matter where they live."

Telecoms tycoon Carlos Slim also co-chairs the UN commission. He says nations, governments and stakeholders need to ensure that the potential of broadband for education is fully leveraged so that successful initiatives, such as new online course platforms, and many valuable education and training contents, become quickly available to people worldwide. "Technology should be used for inclusion, and we should make vigorous efforts to ensure this."

Jaeger's point can perhaps be illustrated by a deployment Alcatel-Lucent carried out for Ooredoo Algeria last year. According to the Qatar-based telco, its 3G mobile network was ranked as the fastest in North Africa in 2014 by the official Network Quality Benchmark. That hasn't come cheap as Ooredoo Algeria has invested more than USD2bn as part of a recent network enhancement programme.

Last December, it announced that Alcatel-Lucent had deployed a 400G optical backbone network to enable high-speed ultra broadband mobile access in Algiers, Constantine, Oran, and some smaller cities. The transport network became fully operational at the end of 2014 and is based on the vendor's DWDM optical technology and platform. It will support data speeds of 400Gbps on each of its 88 wavelengths.

Clearly then, Africa has plenty of technology options when it comes to building broadband networks for all. But Jaeger adds that as well as the technology, there is another important factor to consider: cooperation. "It's an illusion to think that one operator, or one government, or one organisation can bring broadband to the masses. That is important from a funding point of view because it's an expensive exercise to bring broadband to the masses."

Liquid Telecom is not letting money get in the way of its plans. In February 2015, it raised USD150m to extend its broadband networks in Africa, and Rudnick says fibre is being rolled out to bring broadband services to as many people in Africa as possible. But he admits that it's likely that some areas, given the size of the continent and the dispersion of its population in rural areas, will remain far away from Liquid's fibre infrastructure for a long time. Here, satellite can fill the gaps. The technology also continues to play an important role in providing a backup solution.

As for what challenges there are to laying fibre in Africa, Rudnick believes that the way the population is scattered all across the land is the main hurdle to overcome. "In Africa, about 700 million people out of about a billion live outside the urban areas. The dispersion of the population is such that the terrestrial telecommunication infrastructure is today only able to get close enough (about 25km) to about 480 million people.

"Except for satellite, the economics of telecommunication services are based on density of population around focal points, such as a town centre. This means that a mobile operator will find it extremely difficult to finance a new base station in an area where an insufficient number of people dwell or are able to reach daily.

"Moreover, densely populated town centres that are too far away from the nearest telecommunication node, such as another base station or a fibre optic cable node, may not be serviced given that new backhaul infrastructure to connect this new node could be uneconomical.

"Finally, the population that lives too far – i.e. more than 1km – from a focal point, assuming they cannot afford satellite service, may find that the service they receive is of poor quality, due to the weaker wireless signal in their area."

So what is the ultimate solution to connect people in Africa to broadband? Jaeger reiterates the point made earlier by the GSA's Hadden when he says: "It has to be a mix of technology. There is no single technology that can cover it all. In some areas where you have copper, you will have to push this copper as far as you can. For other areas, it's worth investing in fibre. In other areas, you will need to work with LTE, sometimes even 3G still. Satellite is also an option. There are very creative ways of using satellites." ■

Towercos are building more new 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 underway. 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 users 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

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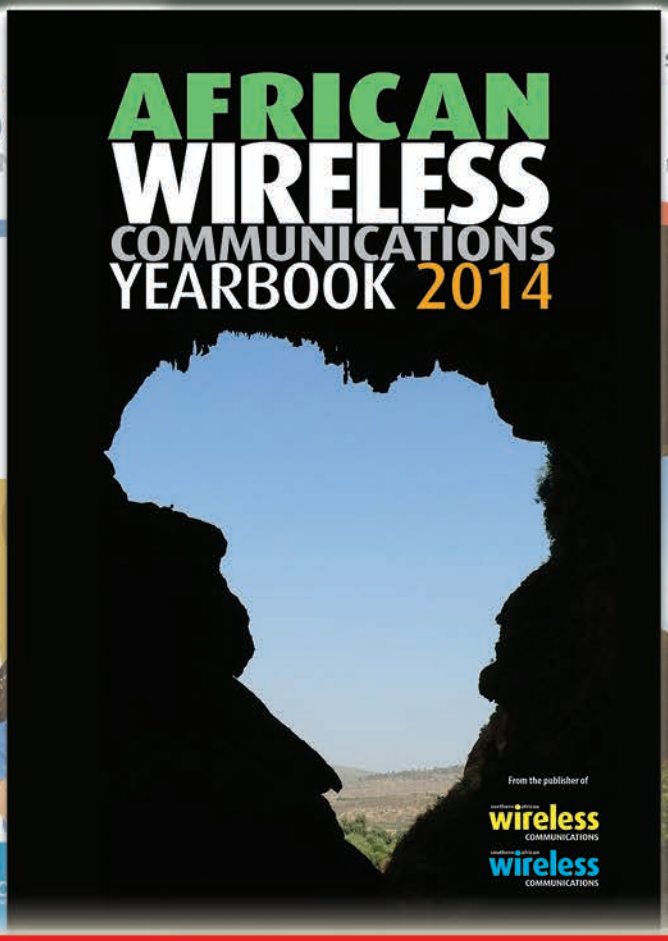

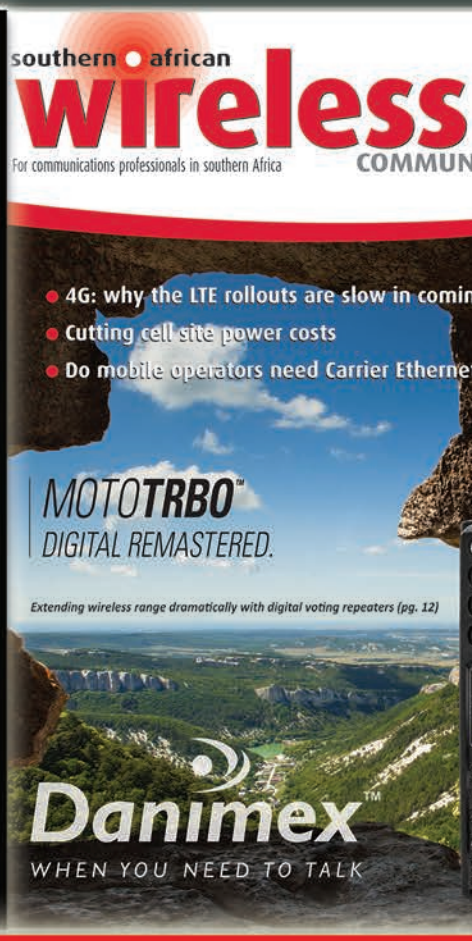

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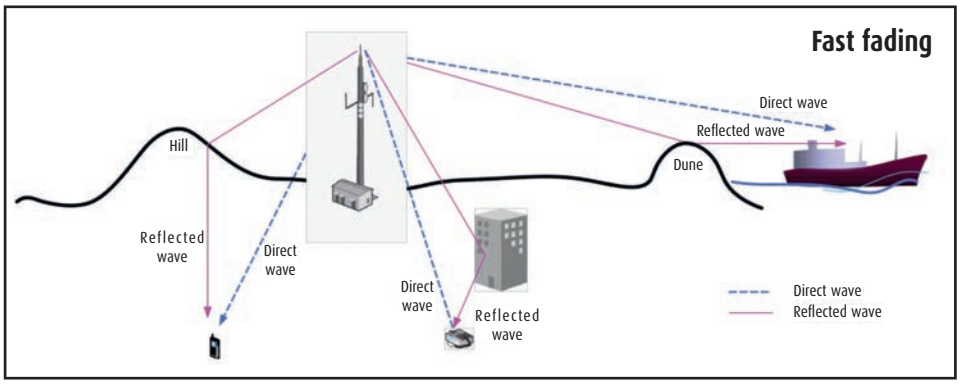
Improving recovered signal quality in TETRA

Various factors affect the transmission of digital signals, causing noise, distortion and degradation. IAN MACPHERSON describes the techniques to help address these issues.

To ensure the reliable recovery of transmitted digital signals, modern communication systems must overcome a number of factors affecting the signal's propagation through space, causing the signal to noise ratio (SNR) to degrade and, consequently, compromising the radio's ability to decode a voice or a data message.

A number of techniques exist that help overcome these distortions. The first approach advocates use of a triple diversity receiver design, while the second argues for dual diversity in tandem with equalisation techniques.



Factors affecting signal propagation and quality

Fading is a big issue here and manifests itself in several ways.

Slow fading is the attenuation of the radio signal due to propagation loss and shadowing, where the changes in signal strength are relatively slow. Slow fading or long-term fading is caused by amplitude variations due to diffraction or shadowing. When the receiving antenna moves into the shadow of a large object, or moves under the horizon of the transmitting antenna, the radio signal will fluctuate and fade away relatively slowly.

In real life, slow fading is caused by hills, buildings, tunnels, trees and other large objects that attenuate or block the radio signal. It can be reduced by careful positioning of sites to minimise shadowing effects, and power control according to TETRA standard 300 392-2.

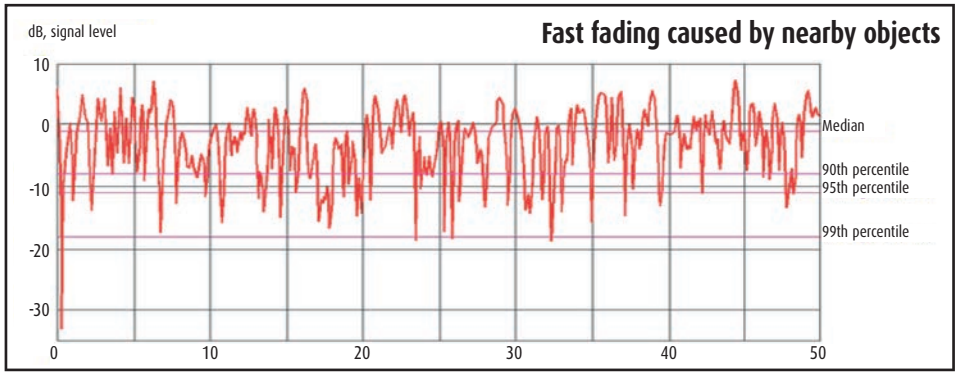
Fast fading – also known as short-term fading, Rayleigh fading or delay spread – is the attenuation caused by multi-path propagation of the signal. The receiver hears the wave on the direct path, plus one or more reflected waves. When superimposed, signals with the same amplitude and opposite phase shifts will destructively interfere with each other. This creates characteristic fading dips within a distance of fractional wavelengths (e.g. ~10cm).

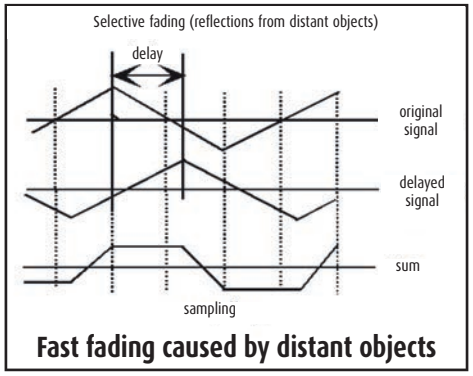
Fast fading is applicable to obstructed propagation paths (non-line-of-sight conditions) and can be mathematically described by the Rayleigh distribution. Multi-path propagation from nearby objects behaves differently to multi-path propagation from distant objects as shown above:

In urban areas, nearby objects will have a more severe and destructive impact due to the superposition of partial waves. Nearby objects can result in flat fading, when the reflected wave is 180° out of phase with the direct wave, and of equal strength. The result will be an electrical cancellation of the two signals at the receiving aerial. Fading dips caused by nearby objects will typically occur at $\lambda/4$ and the fading dips can be very deep.

With distant objects, the reflected wave may travel many wavelengths more than the direct wave, and thus the cycles of the modulating signal are out of phase. This is known as selective fading or ISI (InterSymbolInterference). Rocks and large waterfronts, such as lakes or sea are known to create ISI.

The Rician fading model describes the effect of a direct wave and a reflected wave. The ratio of the direct to indirect signal energy is known as





the 'Rice factor'. This fading type is applicable to partially obstructed propagation paths.

Compensating for fading

A number of techniques can compensate for some of the SNR losses in high-fade environments, helping to restore the quality of the recovered signal.

Firstly, there are diversity techniques. These are based on the fact that receiving multiple, uncorrelated samples of the same signal at the same or delayed time, can reduce fast-fading dips, co-channel interference and avoid error bursts.

When two received signals are combined, the achieved signal quality is better than either of the partial signals alone. Diversity will improve the performance of the TETRA radio system in environments where significant RF signal reflections are expected or when there is no clear line of sight between a transmitter and the receiver.

The following diversity schemes can be applied to the base station:

Space diversity (also known as antenna diversity) utilises two or more antennas to reduce fast-fading effects. To reiterate, fast fading is caused by multi-path propagation and mostly by the reflections of the radio waves. A radio receiver hears the wave on the direct path plus one or more reflected waves which can differ in phase, amplitude and polarisation. The intercepted radio signals therefore interfere and fluctuate very fast in amplitude.

To overcome loss of signal where a reflected wave is in anti-phase with a direct wave and to improve the quality and reliability of the radio link, antenna diversity can be applied with the TETRA base station. Space diversity performs very well with TETRA radio sites in all environments.

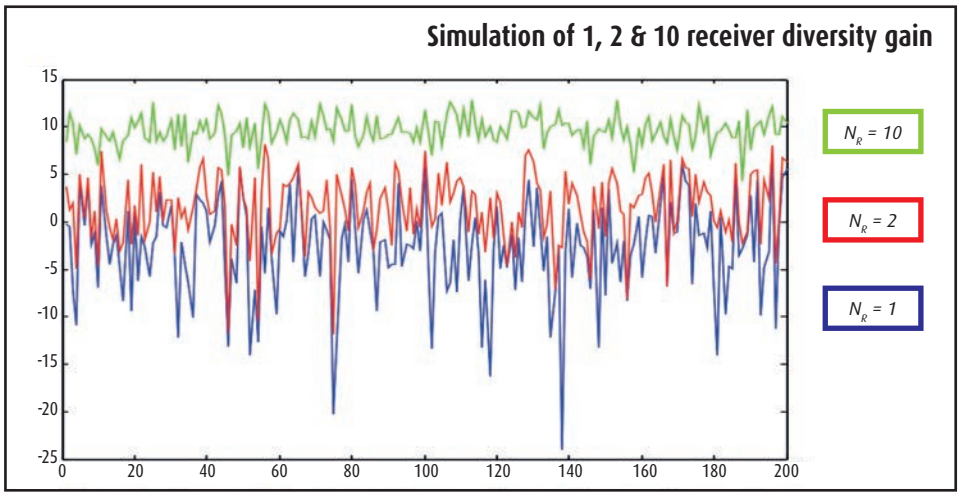
Horizontal space diversity requires two or more vertically polarised RX antennas to be separated horizontally by a certain distance. The gains derived depend upon the fading conditions and the final configuration, such as the height of the antennas above surrounding terrain and the actual spacing between them. The drawback of space diversity is that it requires a wide space separation with an additional cost for RF equipment and mechanical antenna support structures.

Polarisation diversity can be applied by using cross-polarised antennas. Signals can be received using, for example, horizontal and vertical or ±45° slanted polarisation in cross-polarised antennas.

The advantage of polarisation diversity is that it does not require a wide space separation and, with the TETRA base station, can be achieved with one antenna. In urban environments where multi-path propagation involves reflections on vertical surfaces (with high buildings and narrow streets), polarisation diversity can immunise polarisation mismatches that would otherwise cause signal fade.

Receive antenna diversity typically yields between 2-4dB of gain. This is significant but assumes that the received signals are significantly uncorrelated and both signals are close in amplitude to each other.

However, even if we analyse the addition of further degrees of receiver diversity in ideal conditions (completely uncorrelated signals) – as shown in the figure above for 1-, 2-, and 10-way diversity in an environment with very deep fades – we achieve typical values of 1 to 2dB with each additional degree of diversity.



Secondly, there is equalisation. Channel equalisation is a filtering technique that decouples the received data into uncorrelated sub-streams that can be easily decoded. The equaliser is a device that attempts to reverse the distortion incurred by a signal transmitted through a channel. Its purpose is to reduce ISI to allow recovery of the transmitted symbols.

Equalisation counters the effects of time dispersion (also ISI), while diversity reduces the depth and duration of the fades experienced by a receiver in a flat fading (narrowband) channel.

Thirdly, channel coding improves mobile communication link performance by adding redundant data bits in the transmitted message. It is used by the Rx to detect or correct some (or all) of the errors introduced by the channel (post detection technique).

It is the objective of the first two techniques to bring independently, or in tandem, the bit error rate (BER) of the signal to within four per cent or better. Channel coding applied thereafter (as is done in systems from all TETRA suppliers) ensures a clear audio signal conforming to the required intelligibility for its use in critical communications.

Conclusion

In summary, fast fading can be reduced in TETRA systems by implementing the following techniques individually or in combination:

Improved antenna configurations (diversity):

- Two receiving antennas spaced horizontally or vertically
- Three receiving antennas spaced horizontally and/or vertically
- Six receiving antennas spaced horizontally

For channel equalisation to combat Inter Symbol Interference, the TETRA standard identifies two base station channel equalisers:

- TU50 – typical urban with 50kph speed
- HT200 – hilly terrain with 200kph speed

Channel coding (error correction):

- Block encoding (uses checksums)
- Convolution coding (extra bits added for forward error correction)
- Interleaving and re-ordering (possible error bursts are distributed)

A number of vendors propose the use of triple diversity while others advocate the use of a combination of dual diversity combined with an equalisation algorithm. Incidentally, the latest cellular systems combine both techniques.

Compared to triple diversity systems, there are advantages of using double diversity with equalisation filters.

Firstly, diversity reduces the depth and the duration of a fade, and equalisation counters the effects of time dispersion. So a system using both techniques is more versatile, improving performance not only in fringe coverage areas and in buildings but also in noisy and high mobility environments.

Secondly, as the degree of diversity implemented increases, there are costs associated with a more complex antenna system, but also with the towers supporting the antennas. The wind-loading impact to towers caused by additional antennas and cabling is doubled in the transition from double to triple diversity.

Thirdly, the combined nominal gains resulting from the combination of double diversity and equalisation filters (5-7dB) equal, and at times exceed, those derived from triple diversity systems (4-6dB).

Thus, two-way diversity with equalisation provides a versatile deployment model overcoming coverage issues in-building and within fringe areas, high-noise and high-mobility environments. It provides comparable performance to three-way diversity, whilst reducing capex and opex. ■

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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".

Round-the-world solar flight relying on satcoms

Intelsat and ITC Global are providing ground-to-ground satcoms services to the team attempting the first round-the-world solar flight.

Solar Impulse-2 began its quest in early March. It has already flown a total of around 37 hours and 1,468km on its first two legs from Abu Dhabi to Muscat and on to Ahmedabad. The team aims to complete its global circumnavigation sometime in August.

ITC Global specialises in providing satcoms to remote and harsh environments. Working with Intelsat, it has enabled *Solar Impulse-2*'s ground crew and support teams to communicate from anywhere to anyone in the world

Using a 1.8m, quick-deploy antenna, the crew will be able to leverage Intelsat's global satellite network for broadcasts, webcasts, email, phone, data and video communications during the 35,000km trip which is expected to take around 550 flight hours to complete. Intelsat and ITC Global are also providing round-the-clock operations centre support during the trip.

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

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

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.

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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.

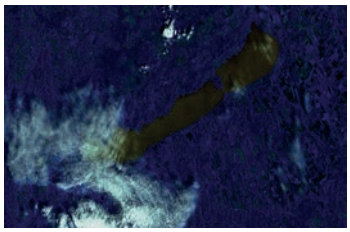
The monastery now broadcasts to more than 500 members daily and has been able to rebuild a strong following from both the local and global internet community. It has even expanded its range of services and is providing content via online radio and cached video, in addition to its live-streaming broadcasts.

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 pollutions 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 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.



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

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 passenger 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."

Intercity train operator Leo Express says Nomad's onboard Wi-Fi system has led to higher occupancy rates on its fleet.

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.

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

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 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, which was 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 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.

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

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Affordable.

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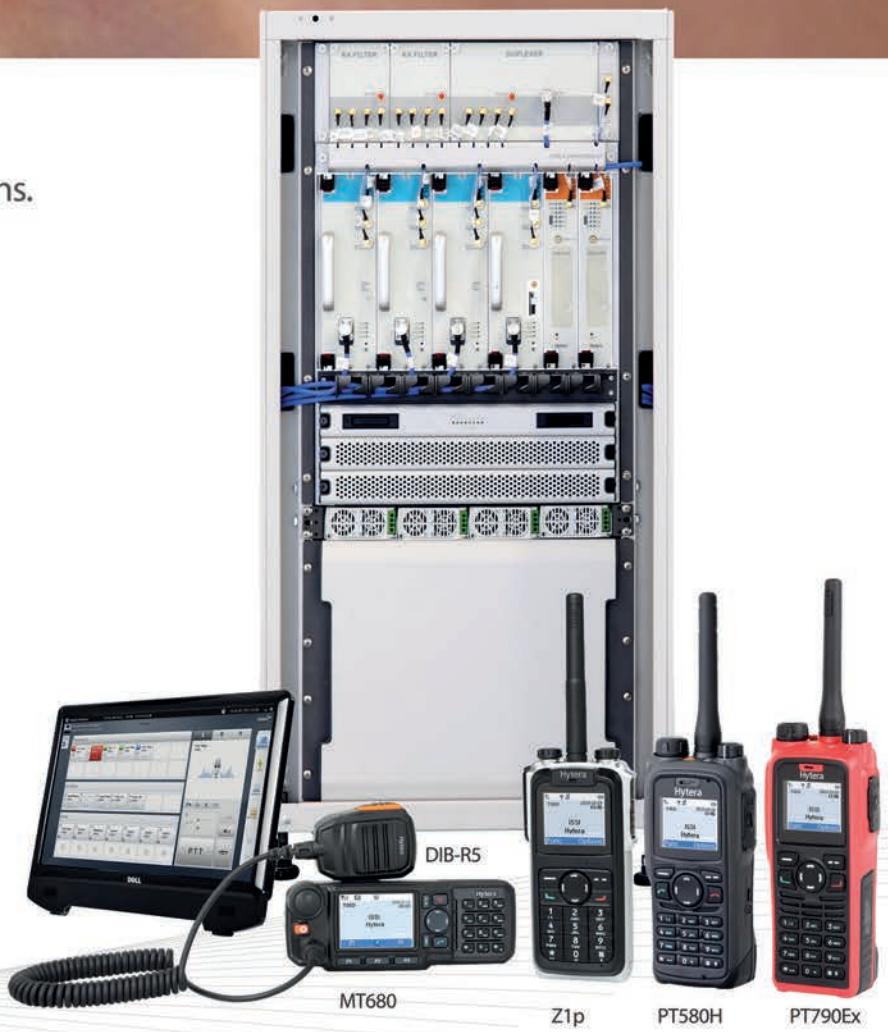

Hytera
Respond & Achieve

TETRA