- **What you need to know about network *security***
- **Creating connections for government and municipalities**
- **HTS: hyperspace networking or just hype?**

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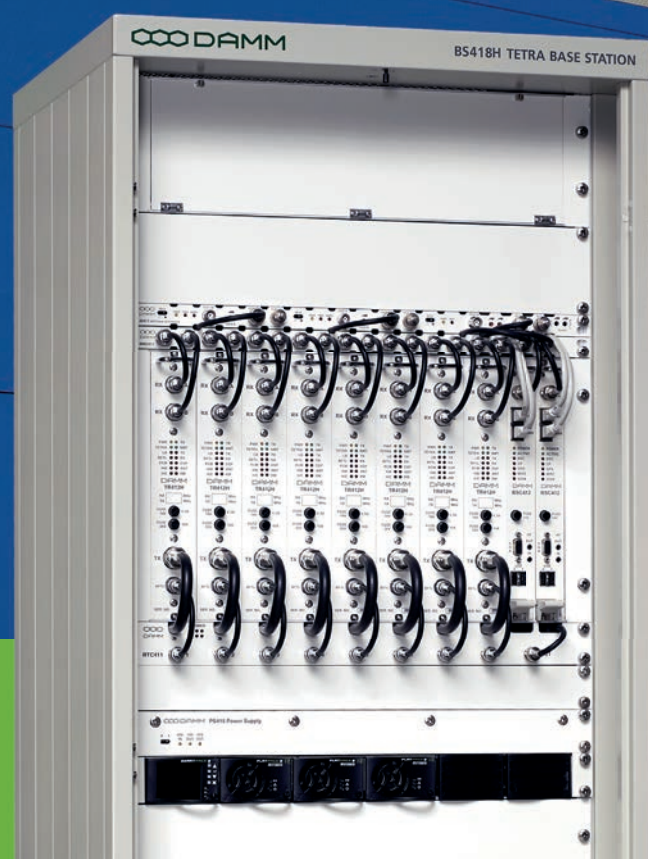
DAMM deployed in Airports in Oman and Saudi Arabia

DAMM TetraFlex® successfully deployed in King Khalid International Airport, Saudi Arabia, Muscat & Salalah Airports, Oman securing critical communication.

Explore DAMM TetraFlex® products and solutions

DAMM is a world-leading provider of scalable, flexible and user-friendly digital radio infrastructure systems to industrial, commercial and public safety customers.

Built for the future of critical communications, the DAMM Multi-Tech Platform enables voice and data communication across technologies, including TETRA, TEDS and DMR in one single system. With over 30 years of experience in critical radio and broadband communication, we take the lead through superior engineering and a constant focus on customer needs and reduced complexity.

To find out more about Damm Cellular Systems or any aspect of our solutions or services, visit www.damm.dk

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KADIUM

"Critical milestone" for delivery of broadband satellite services in SSA

Hughes Network Systems will supply the technology platform for the satellite broadband services that Eutelsat and Facebook are preparing to launch in sub-Saharan Africa.

Eutelsat and Facebook are assembling dedicated infrastructure that will extend cost-effective broadband to parts of the region that are beyond the reach of fixed and mobile terrestrial networks *(News, Oct-Nov 2015)*.

They will now use Hughes' *JUPITER System*, along with high-gain Ka-band spot beam capacity provided by

Spacecom's forthcoming *AMOS-6*.

According to Hughes, the selection of its system marks a "critical milestone" for the delivery of broadband satellite services across the region. It says *JUPITER* features a "flexible and robust" gateway architecture with lights-out operation, enhanced IPoS air interface for bandwidth efficiency, and high-throughput terminals. Hughes claims the platform enables operators to achieve the "highest possible capacity and efficiency for any satellite broadband implementation".

The company adds that *JUPITER*'s underlying technology is a "powerful" System on a Chip (SoC). This is a custom–designed microprocessor that uses multi-core architecture and is said to enable 100Mbps of throughput on every terminal in the *JUPITER* range.

The configuration purchased by Eutelsat includes three gateway stations, two centralised data centres, a comprehensive network management system, and an initial number of user terminals.

Facebook will use three SES satellites to provide broadband services in Africa. They include *ASTRA 3B* which covers North Africa. The satellite is shown here during its earlier manufacturing stage.

4G gains momentum in Algeria and Tunisia

LTE is starting to gain momentum in the neighbouring countries of Algeria and Tunisia.

In May, Algeria's Post and Telecommunications Authority provisionally granted LTE licenses to all three operators it had received applications from. Following an open competition launched in January, it named the winners as: Mobilis (Algeria Telecom), Wataniya Telecom Algeria (Nedjma/Ooredoo) and Djezzy (Optimum Telecom Algerie).

The latter is the country's mobile market leader and is a subsidiary of VimpelCom and Global Telecom Holding. It plans to roll out 4G

services during the summer.

Meanwhile in Tunisia, Ooredoo launched 4G services in early April. It says the 4G upgrade will also help customers using 3G by increasing capacity with LTE technology.

To support the launch, the operator is introducing what it describes as "innovative" bundles for users that include data allowance and free minutes. Subscribers will be able to choose 3G and 4G packages at the same price.

Ooredoo Tunisia is also unveiling a range of VAS, including the *Mobifind* phone locator, *Mazika* music app, *Starz Play* video-on-demand services and *MyCloud* online storage.

Tele10 to rollout YahClick services in East Africa

Yahsat and Tele10 Group are partnering to improve internet connectivity in Rwanda, Burundi and East DRC. The two companies have signed an MoU in the run up to Yahsat taking delivery of its third satellite.

The launch of *Al Yah 3*, which is expected towards the end of this year, will see Yahsat rolling out its *YahClick* broadband service to 19 new markets in Africa during the first half of 2017. Delivered through a modem and small dish, it's claimed *YahClick* is currently Africa's number one satellite broadband service.

As UAE-based Yahsat works towards expanding its coverage area across the continent, it is holding talks with local service providers to reinforce the presence of *YahClick* and strengthen its customer care services.

Tele10 has been serving East Africa for 20 years, providing diverse solutions including pay-TV, radio broadcasting, and ICT services. In 2017, the company plans to offer Yahsat's broadband products and services to its existing customer base as well as new markets which will be served using Ka-band technology.

Vodafone Foundation sets up Instant Schools for Africa

The Vodafone Foundation has launched one of the largest philanthropic programmes in its 25-year history.

During the second half of this year, it will roll out its *Instant Schools For Africa* initiative in the DRC, Ghana, Kenya, Lesotho, Mozambique and Tanzania. The programme will offer access to online learning materials developed in conjunction with Learning Equality, a not-for-profit provider of open-source educational technology solutions, as well as with government ministries and local education experts in each country.

The Vodafone Foundation says

Students in the Kakuma refugee camp in Kenya using tablets from Vodafone Foundation's *Instant Classroom*.

PHOTO: DAVID MUYA, UNHCR

digital learning resources provided via mobile networks offer a cost-effective alternative to conventional teaching

materials, and can be updated instantly to ensure pupils receive the very latest information and insights in the classroom and at home.

Under the *Instant Schools For Africa* programme, pupils will be able to access basic tablets while educators will be equipped with a laptop and projector. The foundation says the educational materials will be aimed at pupils from primary through to high school level, and comparable in quality, range and depth to those available in developed world schools.

Customers of Vodafone or its African subsidiaries will not incur

any mobile data charges when accessing the resources. The company says it will encourage the other major mobile operators in the countries involved to adopt a similar approach.

This latest development is part of the Vodafone Foundation's ongoing mission to use digital and mobile technologies to bring critical educational resources to those who need them most. Last year, it announced the creation of the *Instant Classroom* which is being deployed in partnership with the UNHCR in refugee settlements in Kenya, Tanzania and the DRC *(see News, Feb-Mar 2015)*.

More than four billion SIM cards shipped in 2015

Worldwide shipments of SIM cards increased 0.3 per cent to reach 4.7 billion in 2015, according to the SIMalliance. While those figures are based on numbers reported by its members, the organisation estimates that the total available market last year was 5.3 billion compared to 5.2 billion in 2014.

The SIMalliance's membership represents around 88 per cent of the global market, and includes well-known vendors such as Gemalto, Giesecke and Devrient, Oberthur Technologies, amongst others.

Members reported significant advances in a number of key markets and regions, including Africa and the Middle East which saw shipments rising from 861m units in 2014 to 982m units in 2015.

The organisation said this year-on-year increase of 14 per cent demonstrates the "strong" growth potential of the region's markets.

It believes the increases are due to three factors: the ongoing penetration of smartphones, which is seen particularly in emerging markets thanks to more affordable models leading consumers to upgrade from feature phones; continued subscriber acquisition; and a sharp rise in LTE card shipments as 4G networks start rolling out across African markets.

LTE was also the biggest technology driver of growth in the worldwide SIM market in 2015. According to the alliance, the continued migration to 4G led to every market in every region reporting at least double digit growth in LTE card shipments.

"Globally, an exceptional 88.5 per cent growth in shipments of cards that can be used in LTE networks was observed, driving volumes of this type of SIM to exceed one billion units for the first time," stated the alliance.

Sentinels to monitor Kenya forests in near real-time

Satellite technology will be used for the regular and timely monitoring of Kenya's forests.

Working with local company Ukall and the UK's University of Leicester, the Ministry for Environment, Natural Resources and Regional Development Authorities and the Kenya Forest Service (KFS) will develop a prototype for a near-real-time forest monitoring service using data from the European Space Agency's *Sentinel-1* and *Sentinel-2* satellites.

The measurement, reporting and verification (MRV) service will be delivered directly in an easily accessible reporting format via a smartphone app. It will help Kenya in its preparations for REDD+ (Reducing Emissions from Deforestation and forest Degradation), the UN's framework on climate change.

The University of Leicester's Prof. Balzter said the initial prototype of the monitoring system will focus on a national forest reserve in Kenya.

"Our aspiration is to support participatory forest management strategies to enable Kenya to manage its forests more sustainably and achieve its national forest cover target of minimum 10 per cent by 2030," said Balzter. "The prototype will allow the KFS and the ministry to have timely information on deforestation and forest degradation, and have the means to establish a robust and objective MRV system based on cutting-edge technology."

The University of Leicester's Prof. Heiko Balzter (right) at the Karura Forest Reserve, Kenya. He said deforestation is the second-largest contributor to global climate change after carbon emissions.

Rwanda launches Interconnect Switch

The Ministry of Finance and Economic Planning for Rwanda and Ericsson have signed what's been described as a "breakthrough agreement" for the launch of a national interoperability switch.

The Rwanda Interconnect Switch (RIS) is based on Ericsson's *M-Commerce Interconnect* solution. The vendor claims it will enable financial and payments services providers in the country to connect to one common platform for seamless and real-time payment transactions.

Ericsson adds that the *RIS* will also support the inclusion of informal sectors such as savings cooperatives and micro finance players into the ecosystem, thereby allowing previously excluded citizens to participate in mainstream financial services.

The partnership supports the Rwandan government's aim to create a digital economy and drive greater financial and social inclusion for its society and citizens.

Minister of Finance and Economic Planning Claver Gatete says: "Mobile payment technology has the potential to advance financial inclusion and help people build savings while giving government, as well as the private sector, a more cost-effective, efficient, transparent and safer means of disbursing and collecting payments."

OBS to boost business support in Africa

Orange Business Services (OBS), the B2B division of the Orange Group, has set up a new sales office in Lagos to add to its existing customer support activities in Nigeria. The company claims the move reaffirms its commitment to support enterprises in Africa.

VP for Africa Giorgio Heiman reckons OBS' expanded presence in Nigeria supports both locally-based businesses that are growing and transforming thanks to digital technologies, as well as multinationals from outside the country that are looking to expand on the continent.

In separate news, mining company AngloGold Ashanti has extended and expanded its network contract with OBS. Headquartered in Johannesburg,

OBS will deliver a range of network services for mining company AngloGold Ashanti across 44 sites in Africa, America and Australia.

AngloGold has 21 operations on three continents and currently has several exploration programmes under way in both established and new gold-producing regions of the world.

Under a multi-million dollar and multi-year deal, OBS will deliver a range of network services for AngloGold across 44 sites in Africa, America and Australia to improve collaboration and securely manage internet and cloud growth.

OBS' hybrid network solution includes terrestrial and satellite connectivity, managed security and VPN services. It will allow AngloGold to securely manage growing internet traffic and create a better end-user experience for employees at all sites.

The solution also enables worldwide application of security policies and delivers the flexibility necessary for enabling the use of cloud-based business applications.

Orange Egypt chooses E-band

Orange Egypt (formerly Mobinil) will use an E-band microwave radio system from NEC for backhauling LTE traffic.

The operator has purchased *iPASOLINK EX*, NEC's outdoor, integrated, ultra-compact microwave radio system that supports communications at 81-86 GHz and 70-80GHz frequencies (E-band). Orange Egypt recently went live with the system with an initial group of 60 links.

"We will be able to provide a different experience for our users over the LTE network, with faster access and higher reliability," said Orange Egypt's CTO Hisham Siblini. "On top of that, our telecom network in coastal areas is regularly exposed to salt damage but we are confident that the specialist solution from NEC will resolve those issues."

The vendor claims *iPASOLINK EX* "heralds" a new era in LTE backhaul. It describes the platform as an advanced IP radio and says it acts an invaluable tool for 4G (LTE and WiMAX) deployments as well as LTE small cell aggregation. NEC adds that the radio is capable of delivering more than 3.2Gbps of traffic per link.
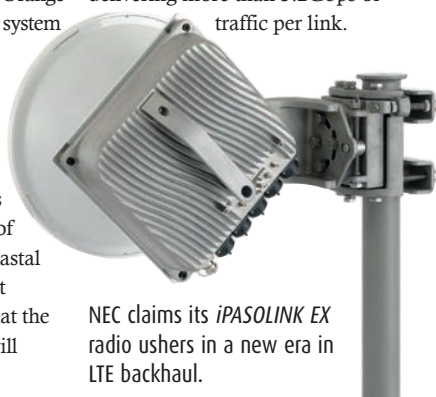
NEC claims its *iPASOLINK EX* radio ushers in a new era in LTE backhaul.

Satellite e-health platform to aid Niger medical care

The CURE Hospital for Children has deployed a satellite-based e-health platform to enhance healthcare in rural and remote parts of Niger.

The hospital specialises in the surgical treatment of children with disabilities. Patients suffer from a variety of different orthopaedic and congenital conditions, such as clubfoot, cleft lip and burn contractures.

By combining satellite connectivity and cloud computing, SATMED will enable the CURE Hospital to establish communications with national and international doctors to receive professional medical advice. Patients can be remotely diagnosed by experts thousands of miles away, while clinicians will also able to improve their knowledge through online courses and resources.

Josh Korn, executive director at CURE Niger, said: "Our participation in the SATMED programme will help us better serve our patients, as we seek to offer them healing and hope for a better future."

SATMED was conceived by SES' Techcom Services division and is funded by the Luxembourg Government and the Ministry for Cooperation and Humanitarian Action. The e-health system aims to improve public health in developing countries by enabling multiple medical applications and tools to operate collectively on a single platform.

This latest deployment of SATMED follows last year's implementation of the platform in hospitals in Benin to improve childbirth healthcare *(see News, Jun-Jul 2015)*.
Connecting government and municipal organisations – Wireless Users pp23-24.

Gazprom helps satellite news gathering services

Rob Miller,
senior security
consultant,
MWR InfoSecurity

ON THE NETWORK

Telemedia will use Gazprom Space Systems' *Yamal-402* satellite to provide SNG (satellite news gathering) services to markets across the continent.

Since 2014, the South Africa-based media specialist has been regularly using capacity on *Yamal-402* for broadcasting African channel packages and Angolan state TV. It recently signed an agreement for further capacity for the SNG services it develops to support political events, elections, sport competitions, etc.

Launched to 55ºE at the end of 2012, Yamal-402 features various Ku-band beams and is said to provide "optimal" coverage of sub-Sahara Africa, as well as the availability of an Africa-Europe cross-connect.

Using the satellite's powerful capacity of more than 10kW with its fleet of

Telemedia uses a range of vehicles with flyaway antennas and portable satellite equipment to provide SNG services.

flyaway vehicles and portable satellite communication stations, Telemedia says it will quickly and efficiently organise occasional use broadcasting and TV contribution both in Africa as well as from Africa to Europe.

In separate news, Gazprom Space Systems has strengthened a

partnership that has so far lasted more than ten years with IABG. The German technology and science service provider will also leverage *Yamal-402* capacity on an occasional use basis for the organisation of television and other content transmission in Nigeria.

Building a secure LoRa solution

Long range radio protocols, like GSM and Wi-Fi, draw a lot of power which makes them unsuitable for smaller or remote devices. In contrast, low power solutions, such as ZigBee or BTLE, are limited in range to tens of metres. So there is a need for a long range solution that only sends occasional, small amounts of data that could run off a battery for years.

LoRa, and its primary protocol LoRaWAN, addresses this gap in the market. It is intended for systems that require the ability to send and receive low amounts of data over a wide range without high power costs.

But whilst several effective security features are designed into LoRa, companies should not consider the protocol secure out of the box. Simply stating that a technology "uses AES-128 encryption" does not mean it is therefore secure. It should be clear to all developers of LoRa solutions that using the protocol does not guarantee security. Instead, they should build LoRa solutions with the potential attacks in mind.

Given that LoRa will form part of a complex IT solution, security vulnerabilities are likely to occur during development. Similarly, given that LoRa solutions are being used in applications ranging from home security through to monitoring and controller infrastructure, attacks and development of exploits against these systems are also likely.

Secure systems can be developed by understanding LoRa's security features as long as developers accept that they are not a silver bullet. A solution can be developed by considering cyber security at every stage. Knowing the different ways that an LPWAN solution can be attacked allows a system to be developed that is built to defend, detect and respond to cyber attacks.

Ooredoo and Arabsat satcoms partnership

Ooredoo and Arabsat will work together to develop new satellite services for customers. Under the terms of a strategic partnership agreement signed around mid-April, the two companies will review the current satellite projects they have in progress. They will then collaborate on technology and design, and on future projects to deliver cutting-edge satellite services, particularly VSAT.

Qatari-based Ooredoo offers mobile, fixed, broadband internet and corporate managed services across markets in MENA and South East Asia. Its mobile operations in Africa

include Algeria and Tunisia. The company also aims to be a leading integrated ICT provider and is said to offer one of the most advanced portfolio of satellite services of any operator in the region.

Arabsat (Arab Satellite Communication) owns and operates six satellites at three orbital positions that can cover Africa. It is also planning to launch *Arabsat-6A* to 30.5°E in 2018, and is in discussions with multiple potential partners to launch a joint satellite to 44.5°E.
■ Ooredoo's Global Services wholesale division and Sparkle, the international

services arm of Telecom Italia, have signed an MoU to collaborate on a range of joint initiatives and services.

The agreement will enable Ooredoo Global Services (OGS) to leverage Sparkle's IP-MPLS backbone and the strategic positioning of Sicily as a hub for telecoms services, particularly for Africa, the Middle East and the Mediterranean basin.

OGS offers a single point of contact for global wholesale carriers across the Ooredoo footprint and is said to offer one of the largest internet peering networks in the Middle East, North Africa and South East Asia.

MTN targets SMEs with BCSG cloud

The MTN Group has selected UK-based cloud specialist BCSG to deliver Software-as-a-Service (SaaS) and Infrastructure-as-a-Service (IaaS) solutions to enterprise customers.

Using BCSG's *Cloud Management Platform*, the operator has initially launched its MTN Business Cloud Services platform targeting SMEs in Swaziland, Rwanda, Uganda, Ghana and Cameroon. It is expected to go live in all MTN markets by the end of 2016.

All the applications and services are available from a single web portal and will be offered across a variety of MTN channels. The operator said there will be one log-in to access all the services, managed through a "user-friendly" dashboard, wherever the business has an internet connection and by using any device.

Debbie Minnaar, acting executive of MTN Group's enterprise business unit, said the platform was developed

to address some of the "pain points" experienced by its business customers, especially SMEs.

"While the benefits of cloud services for SMEs are numerous, the process of accessing and purchasing such services can be daunting," she said. "Through the MTN Business Cloud Services platform, the emphasis is on simplifying this process and meeting customers' needs – essentially we are putting control in our customers' hands."

Connectivity in Sudan

Sudan's National Authority for Communications is partnering with Sudatel (Sudanese Telecommunications) to help build towers in the country. The agreement is part of a project to expand telecoms services in Sudan, and will eventually see the creation of more than thirty towers in remote areas with funding from the universal access fund. In a deal worth SDG18m (USD2.9m), Sudatel will work with local contractors to build nine towers in the Blue Nile and central areas of Darfurf, as well as in southern, western and northern Kordofan.

Satellite dispensers

Arianespace will design, qualify and supply 21 payload dispenser systems for the deployment of OneWeb's satellite constellation. The systems will first secure the spacecraft during their flight to low Earth orbit and then release them into space. They are designed to accommodate up to 32 spacecraft per launch, allowing Arianespace to deliver the bulk of the OneWeb constellation over a period of 18 months, starting in 2018. Swedish firm RUAG Space will be the prime contractor in the development and production of the systems.

New Asia-Africa cable

PCCW Global will build an undersea cable system connecting Africa with the Middle East and South Central Asia. The Hong Kong based telco has signed agreements with pan-African mobile operator MTN, the Saudi Telecom Company, Telecom Egypt and Telkom South Africa to build the *Africa-1* cable. As a minimum, the system will feature a three-fibre core that stretches more than 12,000km across Africa's east coast, with up to a further 5,000km for additional branches. The consortium plans to launch commercial services in 2017.

Eutelsat to use SSL EPS platform for EUTELSAT 7C

Eutelsat Communications has commissioned Space Systems Loral (SSL) to manufacture a high-power broadcast satellite to serve markets in Africa, Europe, the Middle East and Turkey.

EUTELSAT 7C will be based on SSL's *1300* platform. It is the fifth all-electric satellite ordered by Eutelsat and will enable the company to take advantage of reduced launch mass while retaining payload performance.

The new satellite will be located at 7°E which is one of Eutelsat's fastest-growing video neighbourhoods. It is used to broadcast more than 370 channels, and serves several anchor clients such as the Azam, Montage and Muvi TV platforms in sub-Saharan Africa.

Due to be launched in third quarter 2018, *EUTELSAT 7C* will be equipped with 44 Ku-band transponders and co-positioned with *EUTELSAT 7B*, releasing *EUTELSAT 7A* to another orbital location.

"This improved two-satellite constellation will enable it to optimise resources across both satellites, with enhanced coverage flexibility and connectivity set to take the 7° east neighbourhood to a new level," claims the company.

It adds that by almost doubling capacity over sub-Saharan Africa from 22 to 42 transponders, it will also make room for several hundred additional digital channels to support the region's fast expanding TV market.

An artist's impression of *EUTELSAT 7C* which will be Eutelsat's fifth satellite to use an all-electric propulsion system.

EUTELSAT 7C will also be equipped with a beam providing enhanced capacity for government services over Europe, the Middle East and Central Asia, and a beam that can be steered to cover any region visible from 7°E.

Sparkle is net admin for *SEA-ME-WE 5*

Sparkle has been appointed as network administrator for the new *South East Asia-Middle East-Western Europe 5 (SEA-ME-WE 5)* cable system. It will also be responsible for the NOC.

The cable promises to provide the lowest latency connectivity through 16 countries: Singapore, Malaysia, Indonesia, Myanmar, Bangladesh, Sri Lanka, Pakistan, Oman, UAE, Yemen, Djibouti, Saudi Arabia, Egypt, Turkey, France and Italy.

With a design capacity set at 24Tbps on three fibre pairs, *SEA-ME-WE 5* also offers an additional network layer of diversity and resilience for the heavily loaded Asia to Europe route. It is due to come into service by the end of this year.

The system has been developed by a consortium of 19 carriers which include Sparkle, the international services arm of Telecom Italia Group.

The company will carry out its functions as network and NOC administrator at its core landing station in Catania which is the main landing point in Europe for *SEA-ME-WE 5*. Its connectivity solutions will be available to the new cable through the 'Sicily Hub', its next-generation data centre and open ecosystem located in Palermo. The operator describes this as a "rich service marketplace" interconnected with all international cables landing in Sicily where customers can also peer directly with content providers or publicly through Germany-based IXP, DE-CIX.

SEA-ME-WE 5 is said to be the first cable on the Europe-Asia route to provide advanced connectivity on a POP-to-POP basis from open telehouses in Europe and in Asia.

Red Cross app includes unique features

The Kenya Red Cross Society (KRCS) claims it has launched the most advanced humanitarian aid app available in the world today.

KRCS is a voluntary organisation operating through a network of eight regions and 64 branches nationwide. It has more than 70,000 volunteers and members who assist in implementing activities at the headquarters as well as regional and branch levels.

While the majority of humanitarian apps can only perform a specific function, KRCS says its app includes more than 10 vital features such as emergency alerts, requesting ambulance services, and locating
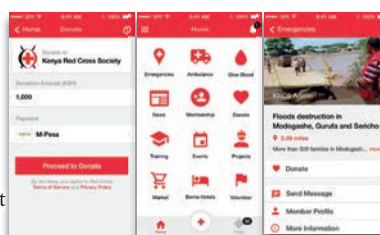
The KRCS app enables users to call an ambulance, sign up for membership, donate, and more.

the nearest blood donation centres.

Available on *iOS* and *Android*, the app was developed in partnership with UK-based Connectik which used its unique multi-tiered infrastructure to build the platform. This enables the KRCS to engage users, provide services, mobilise volunteers, collect donations and send emergency alerts (and much more), at the touch of the button.

The society says that since its launch, the app has been downloaded and engaged with far beyond initial expectations. KRCS says this has allowed it to increase its ability to alert people in Kenya about emergency situations, cut down on its crisis response time, and build a much larger pool of donors and partner companies.

The Red Cross is now looking at deploying the app across 60 countries by the end of the year.

Satellite trackers safeguard riders in desert race

The organisers of this year's Titan Desert, said to be the toughest mountain bike race in the world, used *SPOT Gen3* satellite trackers to enhance the safety of the 400 competitors.

The eleventh Titan Desert race took place in late April. It saw extreme cyclists ride more than 660km across Morocco's cold Middle Atlas mountains followed by vast expanses of searing hot desert. Mobile comms in this remote and harsh terrain are either limited or non-existent, making satellite the only reliable option.

Each competitor carried a small and robust *SPOT Gen3* tracker, enabling organisers, support teams, family, etc., to precisely track their location via the internet. Athletic gear and tracking specialist WAA Tracking provided the customised online solution.

Around 100 race marshals and operations personnel were also equipped with the *SPOT Gen3*. In the event of an emergency, participants could press the SOS button on the device to request help. Also, if a competitor strayed from the route, WAA's geo-fencing software could alert race officials instantly. Nearby 4x4s could then be sent to find and check on the rider.

The 400 cyclists covered over 400km of remote and harsh terrain where mobile communications are either limited or non-existent, making satellite the only reliable option.

A new type of trunk network?

Liquid Telecom provided the Wi-Fi at the inaugural Space for Giants summit that was held at the end of April in Laikipia, Kenya.

The event aimed to help raise the profile of elephant conservation across the continent, and was one of the largest gatherings of African political leaders, philanthropists, celebrities and conservationists.

Liquid Telecom Kenya's broadband services supported live video links with global celebrities such as Leonardo DiCaprio and Lupita Nyong'o, and also helped the international media to deliver uninterrupted streaming of events. *Unique 'RAN' helps protect rhino – World News, p33.*

DAMM deployed in Airports in Oman & Saudi Arabia

King Khalid International Airport (KKIA), Muscat International Airport & Salalah International Airport in the GCC, are now utilizing the intelligent, decentralized DAMM TetraFlex® System to secure critical radio communication.

King Khalid International Airport (KKIA), located north of Riyadh in Saudi Arabia, served 18.58 million passengers in 2013, and there is a current expansion in the airport to increase the capacity to 35 million passengers. In KKIA, the system deployed includes redundant DAMM TetraFlex® High Power Indoor Base Stations and the system provides full coverage for one of the world's largest airports in the world.

Muscat International and Salalah International Airports will be the new gateway to the Sultanate of Oman. The New Salalah International will able to handle one million passengers per annum and the new Muscat International Airport will

have capacity to handle 12 million passengers per annum. Further expansions planned in three subsequent phases will ultimately boost the airport capacity to 24, 36 and 48 million passengers when the demand is required. DAMM TetraFlex® deliveries include multisite redundant High Power Indoor Base Stations. The built-in application enabled for this system includes Voice and Data Log System, Group Bridge to interconnect from TETRA to analog radio systems and the open API for easy integration of applications customized to the airport.

Khaled A. Karim, Regional Executive states: "The progress in the Middle-Eastern markets clearly demonstrates the reliability of DAMMs TetraFlex® solutions in a very demanding and complex mission critical environment. The new DAMM Multi-Tech Platform, will continue to provide tomorrows airports with the right balance between security, simplicity and operational effectiveness."

Allan Detlefsen, CCO, DAMM, elaborates: "For both Muscat and KKIA the key factors for choosing DAMM were a successful evaluation and analysis of the customer requirements, as well as the easy integration of 3rd party applications. With these two airports and more projects already won in named GCC countries, DAMM, along with our regional partner Waves, is proud of these achievements setting yet another milestone in the region as the leader of future proof mission critical radio communication systems"

About DAMM Cellular Systems

DAMM is a world-leading provider of scalable, flexible and user-friendly digital radio infrastructure systems to industrial, commercial and public safety customers. Built for the future of critical communications, the DAMM Multi-Tech Platform enables voice and data communication across technologies, including TETRA, TEDS and DMR in one single system. With over 30 years of experience in critical radio and broadband communication, we take the lead through superior engineering and a constant focus on customer needs and reduced complexity. To find out more about Damm Cellular Systems or any aspect of our solutions or services, visit **www.damm.dk**

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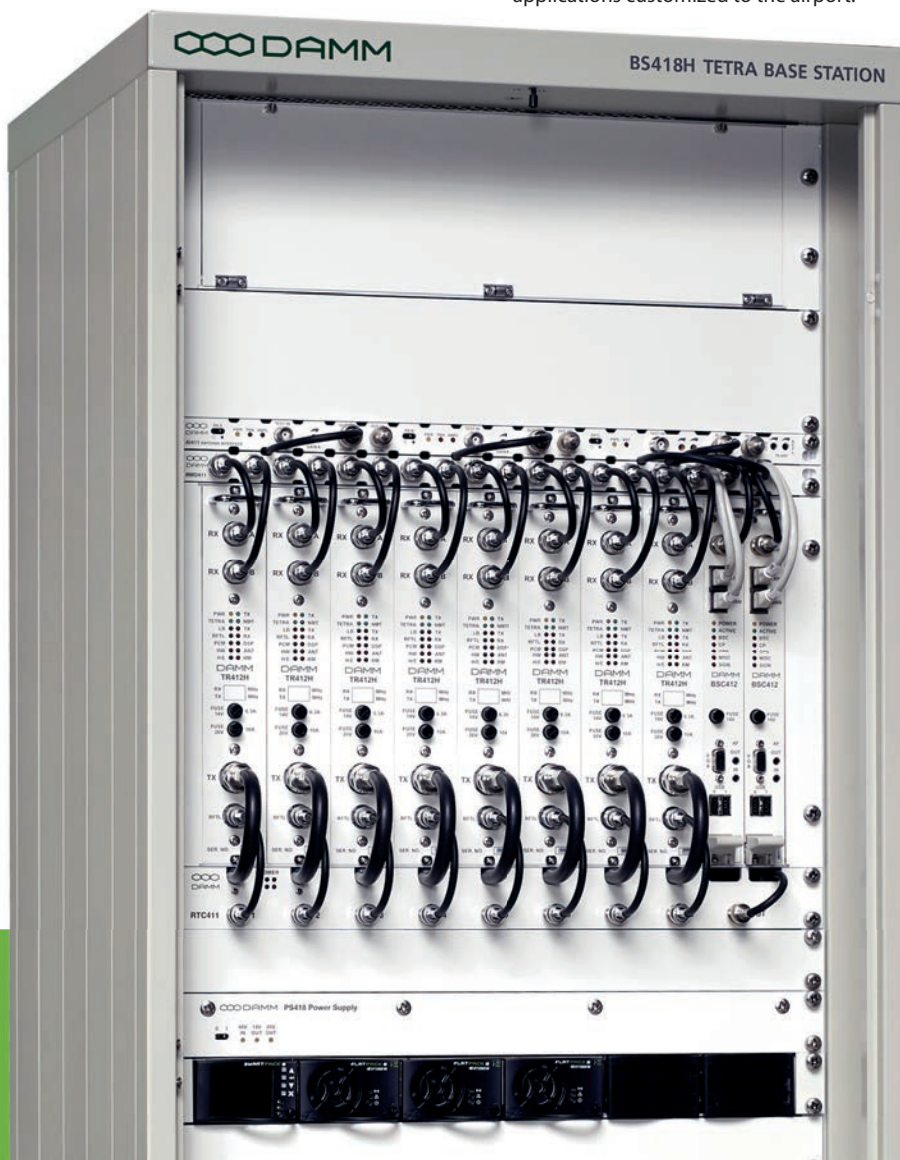
PMP can almost double ROI over traditional last-mile infrastructure

The latest point-to-multipoint (PMP) last-mile solutions can significantly reduce backhaul total cost of ownership and generate 1.8x higher returns on investment for enterprise access, according to Real Wireless.

In its study of the costs of installing and running backhaul networks based on a range of wired and wireless technologies, Real Wireless found that PMP solutions offered up to 50 per cent TCO savings over PTP and managed fibre, largely due the aggregation of multiple links to a single hub site. The independent wireless specialist

considered a range of transport options, including managed fibre, V-band and E-band PTP, microwave PTP and PMP, and sub-6GHz unlicensed PTP and PMP.

As part of its research, the company modelled a case study of an ISP building-out a network to supply carrier-grade connectivity to enterprises. The model included not just the initial outlay for equipment but also the more significant aspects of installing and running it over time.

It found that PMP microwave and sub-6GHz resulted in the fastest time to break-even, potentially enabling

an ISP to connect 67 per cent more customers and generate 1.8x higher ROI compared to PTP equivalents.

The report also highlighted the increased revenue possible with PMP at licensed microwave frequencies. Real Wireless said this can generate a further 30 per cent increase in returns compared to PTP in sub-6GHz bands. It said the increased revenue of PMP microwave was due to its ability to offer both higher capacities and a "superior" grade of service than its unlicensed equivalent.

According to the company, the ISP model can equally apply to a

mobile operator's network division, where the higher ROI equates to greater financial efficiency and more ability to invest in network footprint.

Real Wireless found that managed fibre networks, albeit scalable to higher capacities, had a significantly higher TCO when compared to wireless approaches. Here, PMP solutions were shown to offer a much quicker ROI because they lend themselves to the sharing of hub sites and bandwidth between customer terminals. However, PTP links were found to more suitable for longer links and lower site densities.

Growth in mobile money transfers booming in Ghana

MTN says its *Mobile Money* service has become the fastest-growing way of receiving WorldRemit international money transfers in Ghana.

The operator claims the number of transfers received on mobile accounts is growing by an average of 13 per cent per month. Countries sending the most money to Ghana include the UK, USA and Australia.

WorldRemit specialises in international transfers to mobile money platforms, and is said to have connections to 32 services in 24 countries across Europe, Africa and Asia. It was established in 2010 and began offering transfers to *MTN Mobile Money* in Ghana in January 2013.

MTN says the increased use of mobile money in remittances is also driving a new phenomenon of 'micro-remittances' where people send smaller amounts, more often. For example, it is most commonly used for transfers of less than GHS300 (around USD78), with the average WordRemit sender transferring around three times per month.

"Instant messaging also has a role to play in driving these type of micro-remittances," says WorldRemit senior mobile analyst Alix Murphy. "Ghanaians are constantly talking to their family and friends abroad and many of those discussions are about their personal finances."

According to World Bank data,

Ghanaians living overseas send home more than USD2bn every year. Around 70 per cent of adults are either unbanked or underbanked in the country, whereas 91 per cent have access to a mobile phone.

Africa Internet Group adds Orange to its list of big backers

EUR75m equity interest in the Africa Internet Group (AIG), joining AXA, Goldman Sachs and longstanding investors MTN Group, Millicom and Rocket Internet.

Orange will help Jumia and other websites run by AIG to accelerate their growth and seize development opportunities on the continent. The operator says its investment will be accompanied by a series of strategic partnerships between the subsidiaries of the two groups.

Jumia offers an online platform for businesses to market their products and services to Africa's emerging middle class. Since its creation in Nigeria in 2012, AIG says Jumia has seen significant and continuous growth with ten online consumer businesses now operating in 23 African countries, enabling more than 50,000 local and international companies to do business with the continent's consumers.

Other services offered by AIG include an e-commerce marketplace (Kaymu), websites offering food delivery (Hellofood) and hotel booking (Jovago), online classified ads for general merchandise (Vendito), and others.

Group CEO Stéphane Richard says the investment gives Orange the capacity to spearhead e-commerce.

The company says that by combining Orange's support and expertise with that of its existing shareholders, it will be able to further improve its service offerings and the customer experience, while continuing to invest in infrastructure.

Orange Group chairman and CEO Stéphane Richard adds that the strategic investment gives Orange the capacity to play a leading role in Africa's fast-growing e-commerce market.

"This acquisition is combined with the signature of several important partnership agreements that will create value for all parties," he says. "In particular, across the twelve countries where we have a common presence, this investment will enable us to significantly develop our ability to market products and services developed by Orange Middle East and Africa over the internet."

DAMM teams up with Tait on DMR

Tait will supply DMR radio terminals that can be deployed with systems from Danish PMR specialist DAMM.

The strategic alliance agreement extends the global market reach for both parties. DAMM adds that it also complements its position as a full solution provider within critical radio and broadband communication.

"We see the high performance Tait DMR radios as an ideal match for our new cross technology platform offering DMR, TETRA and TEDS in one integrated system," says DAMM CEO Kjeld Pharao. "Combining the intelligent DAMM infrastructure and Tait terminals will provide a one-stop-shop for our system partners. End-customers opting for the trunked DMR Tier III solution from DAMM, will benefit from the expertise and innovative solutions of two state-of-the-art communication providers."

He goes on to claim that the alliance will lead the way to help customers benefit from the world's first and only truly universal DMR base station, mountable indoor and outdoor.

This latest alliance for DAMM follows on from its partnership deal with Airbus Defence and Space last year (see Wireless Business, Jun-Jul 2015).

French court unfreezes RSCC's Eutelsat receivables

The High Court of Paris has lifted the attachment from the receivables owed by Eutelsat to the Russian Satellite Communications Company (RSCC).

Earlier this year, France froze around USD1bn of assets as part of a USD50bn award against the Russian

state for dismantling the Yukos Oil Company. This was once Russia's biggest oil producer but its founder and owner, Mikhail Khodorkovsky, was a vocal critic of Putin's Government.

According to reports, the funds include USD300m owed by Arianespace to Roscosmos for Soyuz rockets and USD400m owed by Eutelsat to RSCC. A final decision on all the sums frozen by France is expected around the end of the year.

However around mid-April, the High Court decided to lift the attachment from the receivables owed by Eutelsat to RCSS under their current contracts, obtained earlier by Cypriot company and former Yukos shareholder Hulley Enterprises. The court has held that the attached assets did not belong to the Russian Federation but were the property of RSCC.

"We are satisfied with the equitable decisions of the French court," said RSCC DG Yuri Prokhorov. "We are looking forward to further successful cooperation with our strategic partner, Eutelsat, in satellite communications and digital broadcasting."

Famous brand returns to mobiles

Under a strategic agreement covering branding rights and intellectual property licensing, HMD global Oy has been granted an exclusive global license (excluding Japan) to create Nokia-branded mobiles and tablets for the next ten years. Nokia Technologies will receive royalty payments from HMD for sales of the branded products.

Recently founded in Finland, HMD will be led by Arto Nummela as CEO. He previously held senior positions at Nokia and is currently the head of Microsoft's mobile devices business for Greater Asia, MEA, as well as Microsoft's global feature phones business.

The company intends to invest more than USD500m over the next three years to support its global marketing campaigns. Its new smartphone and tablet portfolio will be based on *Android*.

HMD has also conditionally agreed to acquire the rights to use the Nokia brand on feature phones as well as certain related design rights from Microsoft. The transaction is expected to close in H2 2016.

Meanwhile, FIH Mobile has announced that it will acquire the remainder of Microsoft's feature phone business assets, including manufacturing, sales and distribution. FIH is a subsidiary of Hon Hai Precision Industries and is perhaps better known by its trading name, Foxconn Technology Group.

HMD and Nokia have signed an agreement with FIH to establish a collaboration framework. HMD will have full operational control of sales, marketing and distribution of Nokia-branded devices, along with exclusive access to the global sales and distribution network to be acquired from Microsoft by FIH, access to FIH's manufacturing, supply chain and engineering capabilities, and to its growing suite of proprietary mobile technologies and components.

INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
4/4/16	Brocade	Ruckus Wireless	Company	USD1.5bn	Brocade says acquisition will mean it can add Ruckus' higher-growth wireless products to its enterprise networking portfolio.
11/4/16	Telit Communications	Novatel Wireless	Various assets	USD11m	The IoT specialist will buy several cellular module product lines, related IP & related assets for an initial cash price & conditional earn-out consideration, which is expected to be non-material.
29/4/16	SES	O3b Networks	50.5% stake	USD20m	SES increases its fully diluted ownership of O3b from 49.1%, bringing its aggregate equity investment in the company to date to USD323m. In late May, it announced capital raising of €908.8 million to fund a move to 100% ownership.
9/5/16	Global Eagle Entertainment	Emerging Markets Communications (EMC)	Company	USD550m	Following the merger, GEE says its global satellite-based connectivity platform will service more than 700 planes, 1,600 vessels, 100,000 cruise ship cabins, & several thousand land-based sites.

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
5/4/16	Philippe Vallée	Gemalto	CEO	Gemalto	CCO
5/4/16	Olivier Piou	–	–	Gemalto	CEO – retiring as from August 2016
5/4/16	Zhao Xianming	ZTE	President	ZTE	EVP
8/4/16	Brent Dippie	Zetron	President & CEO	Zetron	COO & SVP
8/4/16	Ellen O'Hara	Zetron/EFJohnson	Chairman/board member	Zetron	President & CEO
8/4/16	Elie Lobel	Orange	CEO of healthcare	ASIP Santé	Director, national e-health projects unit
11/4/16	Olof Lindberg	CCS (Cambridge Communication Systems)	VP sales	Coromatic International	VP worldwide sales
19/4/16	Emmanuel Saint Dizier	RFS	VP, strategy & portfolio	RFS	Product manager
21/4/16	Fredrik Jejdling	Ericsson	SVP & head and of network services	Ericsson	Head of sub-Saharan Africa
21/4/16	Jean-Claude Geha	Ericsson	Head of sub-Saharan Africa	Ericsson	Head of managed services
25/4/16	Andreas Teuber	Signalhorn	Sales director	Prolifics Deutschland	Sales director Germany
9/5/16	Obafemi Banigbe	Kirusa	Advisory board member	Silver Rock Technology Services	Managing partner
11/5/16	Babak Fouladi	MTN Group	Group executive for technology & information systems	Vodafone Spain	CTO

Worldwide job losses at Nokia

Nokia has started the process of reducing its global workforce. As a result of its acquisition of Alcatel-Lucent last year *(see Wireless Business, Apr-May 2015)*, the company is targeting EUR900m of opex cuts to be achieved in 2018.

The job losses will occur over the next two years. As previously outlined last October, Nokia says they will largely be in areas where there are overlaps, such as research and development, regional and sales organisations, and corporate functions.

Processes and timelines will vary from one country to another. Around mid-April this year, Nokia met with its two European Works Councils and similar meetings and consultations with employee representatives are due to take place in almost 30 countries during the coming weeks.

Nokia President and CEO Rajeev

Nokia president Rajeev Suri said the company will provide "transition and other support for impacted employees".

Suri says: "We know that our actions will have real human consequences and, given this, we will proceed in a way that is consistent with our company values and provide transition and other support to the impacted employees."

As well as the redundancy programme, Nokia says it is shifting resources to future-oriented technologies such as 5G, cloud and

the IoT. The company also continues to target worldwide savings in real estate, services, procurement, supply chain and manufacturing.

Ericsson overhauls structure

Ericsson is reorganising in an effort to drive growth and profitability.

"We will create a leaner, more fit for purpose organisation, to cater for the needs of different customer segments and to faster capture market opportunities," says Ericsson president and CEO Hans Vestberg. "As 5G, the Internet of Things, and cloud drive the next phase of industry development, the time is just right to make these changes."

As from July, the company's new structure will comprise five business units (BUs). These include two that cover the company's networks business. Headed by Fredrik Jejdling, BU networks services focuses on

managed services, network rollout and customer support; while BU network products combines radio and transport, and is led by Arun Bansal.

The other units include two that focus on IT and cloud products and services, and a dedicated customer group for industry and society.

Vestberg reckons the changes will make it easier for customers to do business with the company, whether they are an operator, a media company or from another industry.

This latest restructure follows on from a number of key strategic decisions made by Ericsson in recent years. This includes exiting the handset and modems businesses, an enhanced partnership strategy on IP (such as the tie-up with Cisco announced last year), and investments to build targeted growth areas with strong focus on software and professional services.

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
6/4/16	ZTE	China	FY15	RMB	100.19 (bn)	NA	0.78	Revenue growth reflected increased sales from 4G system & optical access products. High-end routers & handsets in the international market also saw significant growth.
14/4/16	Arianespace	France	FY15	EUR	1.433 (bn)	NA	NA	Turnover increase of 2.4% beat previous all-time high of €1.399bn in 2014. Attributed to a record number of 12 launches last year. 33 contracts worth €2.5bn signed during 2015, increasing order backlog to €5.3bn.
19/4/16	C-COM Satellite Systems	Canada	1Q16	CAD	2.433	NA	0.0125	Compared to 1Q15, revenues are up 10.5& but net profits are down 18.0%. Company ended quarter with cash position of more than $15m & continues to be debt free.
25/4/16	Millicom	Luxembourg	1Q16	USD	1.53 (bn)	550	0.22	In Africa, organic revenue growth grew 11.9% to $220m with service revenue rising 12.1%. All countries with the exception of Rwanda reported double digit growth. EBITDA grew strongly, 11.8% on Q4 and 13.5% year-on-year to $57m at a margin of 25.8%. DRC now a discontinued operation.
28/4/16	Intelsat	US	1Q16	USD	552.6	407.5	NA	Total on-network revenue declined by $58.2m, or 11 per cent, to $493.8m compared to 1Q15. Off-network revenue (income from consulting & other services plus CPE sales) reported aggregate increase of $8.5m, or 17 per cent, to $58.8m compared to 1Q15.
28/4/16	Gemalto	Netherlands	1Q16	EUR	691	NA	NA	Revenue is up 1% at historical exchange rates & flat at constant exchange rates. Mobile segment posted revenue of €258m, 20% lower at constant exchange rates compared to first quarter of previous year.
29/4/16	SES	Luxembourg	1Q16	EUR	481.6	356.2	NA	Earnings up 0.8% over the prior year but down 1.9% at constant currency. FY 2016 revenue expected to be between €2,010 million & €2,050 million.
12/5/16	VimpelCom	Netherlands	1Q16	USD	2,023	758	NA	Total group revenue for quarter decreased 12% due to adverse currency movements; in Algeria, service revenue was organically stable YoY as decrease in voice revenue was offset by growth in data, content & interconnect earnings.
12/5/16	Eutelsat	France	3Q15	EUR	383.0	NA	NA	Total revenues up 1.1% at constant currency, but growth in the quarter below expectations, reflecting a worse than expected environment in several emerging markets, particularly Latin America. Full year earnings now expected to be broadly flat & at bottom-end of previously anticipated 2-3% range.

Netscout claims first with 802.11ac handheld tester

Netscout has enhanced its *AirCheck* handheld tester. The latest version includes features such as trouble-shooting and diagnosing Wi-Fi networks built using the 802.11ac

MANUFACTURER:
Netscout Systems

PRODUCT: AIRCHECK2

MORE INFORMATION:
www.netscout.com

standard, AP backhaul testing, and free access to the Link-Live Cloud dashboard for more effective results management.

AirCheck G2 is designed to enable frontline engineers to quickly and easily identify issues responsible for spotty connections, dead zones and slow speeds, as well as locating rogue APs and unauthorised devices.

Among the new features, the device includes 802.11ac 3x3 radios to support next-generation wireless initiatives such as the

Internet of Things, Ethernet tests for AP backhaul verification, and a five-inch touchscreen for improved ease-of-use.

Netscout claims the tester provides technicians with a "broader range" of detailed insights into the wireless network than is currently available using freeware applications or other commercially available software packages.

The Link-Live Cloud service is a centralised management, collaboration and archival workspace

for network connectivity test results. It is said to provide greater job visibility, project control and fleet management for larger distributed environments, and also works with the *LinkSprinter* and *LinkRunner Auto Tester*.

Test system paves the way for latest LTE deployments

Rohde & Schwarz (R&S) says its *TS8980 RF* conformance test system has achieved the world's first validation for both LTE-A uplink carrier aggregation (UL CA) and LTE-A

MANUFACTURER:
Rohde & Schwarz

PRODUCT: TS8980

MORE INFORMATION:
www.rohde-schwarz.com

Pro uplink 64QAM (UL 64QAM).

The *TS8980* is a scalable and validated GCF and PTCRB test system. It provides test coverage for Rel. 8 to Rel. 13 versions of 3GPP 36.521-1 (TX, RX, and performance), 36.521-3 (radio resource management – RRM), and supplementary RF/RRM test plans for wireless network operators.

R&S claims the validation paves the way for wireless operators worldwide to make use of the latest LTE features. It says both functionalities will grant individual users higher uplink

data rates and offer all users higher average uplink data rates.

LTE UL CA is a new feature in the 3GPP Rel. 12 specification that combines two LTE uplink channels for a single user. It increases the currently available maximum uplink rate of 50Mbps per LTE user to 100Mbps per LTE user (using the traditional 16QAM modulation in the uplink).

LTE 64QAM is part of LTE-A Pro, and UL 64QAM was introduced in 3GPP Rel. 13 as a new modulation scheme.

Virtualised small cell gateway to lower TCO

Small cells specialist ip.access says the new *nanoVirt* integrates its 2G, 3G and 4G small cell management and access control functions as virtualised components, running in a carrier-grade virtual machine (VM) environment.

nanoVirt is delivered as software that can be deployed by mobile operators on their preferred server hardware, or hosted in a third-party data centre *(pictured)*. By enabling small cell operators to use generic

MANUFACTURER: ip.access

PRODUCT: nanoVirt

MORE INFORMATION:
www.ipaccess.com
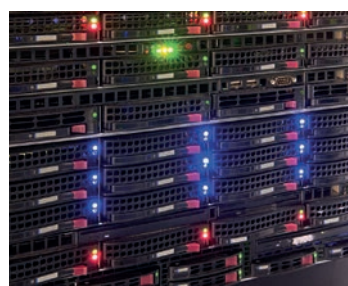
server hardware, ip.access says the platform reduces TCO, removes the need to hold dedicated spares, allows better utilisation of space in the data centre, and simplifies maintenance and support.

nanoVirt is licensed-based on net-work capacity, providing what's said to be a "cost-effective pay as you grow" solution for small cell deployments.

Carlson introduces first chipset-based TVWS radio

Carlson Wireless Technologies reckons its new TV white space (TVWS) chip module will dramatically reduce infrastructure costs while enhancing broadband throughput and IEEE 802.11af interoperability, making affordable broadband connectivity feasible for billions of people.

Developed in collaboration with chip designer MediaTek, Carlson says the *Picasso Gen3* enables a reliable broadband connection with data download speeds up to 96Mbps from a single base station.

The company claims the range of the UHF signal is three to five times greater than a traditional microwave Wi-Fi signal. Unlike other wireless technologies, it says the *Picasso Gen3*'s low-band non-line-of-sight signal

penetrates walls, trees, foliage, and bends over hills even at long distances.

According to Carlson, its radio module is an application-specific IC and direct baseband to final TV frequency, meaning it does not suffer the EVM or S/N ratio losses of frequency re-banding solutions. These boards can now be bought and integrated into new Wi-Fi routers to help drive connectivity in emerging markets.

MANUFACTURER:
Carlson Wireless

PRODUCT: Picasso Gen3

MORE INFORMATION:
www.carlsonwireless.com

"Fastest" vehicle network for public service vehicles

Sierra Wireless has launched an LTE-A vehicle router for mission critical applications in public safety, public transportation and field services.

The *AirLink MP70* is said to enable multiple high-bandwidth applications to work simultaneously, more than 10 times faster and four times further

MANUFACTURER:
Sierra Wireless

PRODUCT: AirLink MP70

MORE INFORMATION:
www.sierrawireless.com

from the vehicle than ever before. The built-in connectivity options include 300Mbps LTE-A, Gigabit Wi-Fi and Gigabit Ethernet via four ports.

The router also provides GNSS and inertial navigation (activated in an upcoming software release), enabling what Sierra says is "superior" vehicle location accuracy, even when out of satellite coverage.

The *MP70* has an integrated events engine, as well as built-in vehicle I/O and support for *AirLink Vehicle Telemetry* to enable advanced awareness and instant insight into vehicle diagnostics, connected mobile assets, fleet

operations and the workforce.

Purpose-built for vehicles and continuous operation in harsh environments, the device features a ruggedised form factor with hardened aluminium casing, and is designed to survive extreme transient surges and maintain performance in noisy vehicle power environments.

Hytera handset gets highest safety rating

Hytera's *PT790 Ex* is the world's first TETRA handheld radio to be approved as 'ia', ATEX's highest level intrinsic safety rating.

The vendor says the device can be safely used in areas where an explosive atmosphere with a mixture of air and flammable gases, vapours or mists is permanently present (zone 0). It says the radio offers "first class protection"

MANUFACTURER: Hytera

PRODUCT: PT790 Ex

MORE INFORMATION:
www.hytera-mobilfunk.com

to users in the mining and oil and gas industries, or fire brigades.

As well as being intrinsically safe, the *PT790 Ex* is dustproof and waterproof according to IP67, and can withstand immersion in water to a depth of a metre for at least 30 minutes. It also meets the requirements of the US MIL-STD-810 F/G-standards.

Features include 'man down' and an adjustable time alarm (lone worker function). A GNSS module comes as standard and collects position data via GPS, GLONASS and Beidou. Hytera says these

data can be transmitted to control centres/ dispatchers with AVL for further analysis.

In addition to voice and data comms, some of the *PT790 Ex*'s other features include encryption, programmable keys, a 1,000 entry phone book, and an interface for extensions and accessories.

The unit itself measures 141mm x 55mm x 39mm, weighs around 515g with its antenna and battery, and also has a 1.8-inch colour LCD. The supplied 1800mAh battery is said to offer around 14 hours on a single charge.

SMS Booster can help MNOs with traffic

Sparkle, the international services arm of Telecom Italia Group, has worked with managed service provider 365squared to develop *SMS Booster* for mobile operators.

According to the company, operators currently have limited

MANUFACTURER:
Telecom Italia Sparkle

PRODUCT: SMS Booster

MORE INFORMATION:
www.tisparkle.com

control and visibility on all incoming application-to-person SMS traffic, resulting in revenue leakage, high signalling costs and complaints about spamming and fraudulent traffic.

SMS Booster combines Sparkle's A2P gateway with 365squared's firewall managed services. Sparkle says the all-in-one solution uses its SMS transit platform that comprises a wide network of worldwide aggregators and direct connection with major OTT players. This is integrated with 365squared's SMS managed filtering service, including round-the-clock business intelligence

and monitoring by a dedicated team.

Sparkle adds that the service enables cellcos to take control of their SMS traffic and generate new revenue streams in a capex- and opex-free model, while also protecting their subscribers against fraudulent traffic.

C-COM tests Ka-band phased array antennas

C-COM has successfully tested the first Ka-band phased array modules based on its patent-pending phase shifter technology.

According to the Canada-based satellite antenna specialist, 4x4 phased array/phase shifting technology will make it possible to deploy low cost, low weight and low profile Ku-, Ka- or hybrid Ku/Ka-band antenna combinations. It adds that the new antenna technology and its extension to higher millimetre-wave (MMW) bands will mean it can also be used for 5G and MMW automotive radar systems.

C-COM's working prototype of a 4x4 Ka-band intelligent antenna module is the size of a business card and uses a low-cost multi-layer planar circuit, based on architecture that is said to be highly flexible, thin, modular, conforming and adaptive.

Tests showed that even with a few of the antenna elements turned off, the module can still deliver an acceptable radiation pattern and without significant performance degradation. C-COM says this is essential in situations when one or a few of the many elements of the active devices may have failed.

Another 1x4 prototype passive phased array module was also tested and validated for Ka-band electronic beam steering capability using C-COM's engineered material phase shifter technology. It's claimed the results clearly showed that electronic beam steering of up to 30º from the norm with minimal impact on beam shape is possible using an extremely simple and low-cost structure consisting of the patent pending phase shifter.

C-COM adds that no active devices were required to accomplish this task, and there was no need to adjust the antenna excitation amplitude.

Security matters

As mobile operators expand their networks and launch new consumer services, experts say they need to adopt more integrated approaches for enhanced security.

With criminals targeting mobile networks, widespread use of SIMboxes, and increasing global cyber crime, the issue of security remains a major concern for operators. DAVE HOWELL reports

As smartphone ownership expands across Africa, the issue of security continues to be a priority for MNOs throughout the continent. While the Communications Fraud Control Association (CFCA) estimates global telecom fraud losses of USD38.1bn in 2015 or approximately 1.69 per cent of revenues, cyber security in general continues to have a high profile as the digital economy and its users come under attack.

According to Trustwave's latest *Global Security* report published earlier this year, the majority of compromises in regions outside North America were in online sales. "E-commerce environments were compromised in 70 per cent of cases in Europe, the Middle East and Africa, with 35 per cent of mobile applications tested having critical security vulnerabilities," said the provider of cyber security solutions which was acquired by Singtel last year.

It will come as no surprise that greater mobile connectivity and broadband access will lead to more cyber crime. For instance, the Kenya *Cyber Security Report 2015* said telcos are a "prime target" for cyber criminals as the country's reliance on technology continues to grow, and all organisations, such as banks and government, depending on internet connectivity from telcos.

The report stated: "Cyber criminals are targeting these organisations because of three main reasons: they control and operate critical infrastructure; they store large amounts of sensitive customer information, and they facilitate mobile money services in the country."

However, while Africa's MNOs are clearly aware of the threats to their networks and the services that they offer, the level of deployment of security systems in both the private and the public sectors to combat cyber crime is low.

Singapore-based Cataleya specialises in IP networking technology including systems for analysis, visibility and intelligence. It believes that given Africa's explosive growth in mobile penetration over the past few years, the main telecom expense management system vendors are now able to offer the same level of security platforms in the region as they do in other continents.

Miguel Lopes, Cataleya's VP of product line management, says: "Before, security systems were expensive and cumbersome to deploy.

But nowadays in the age of NFV/SDN, these technologies are available at reasonable prices, offer flexible deployment models, and are now mostly part of the network by default."

But he goes on by saying that when it comes to fraud, the continent's mobile growth comes with a price: "No operator is an island. African MNOs must quickly adapt to protect their own subscribers from domestic, continental and global fraud attacks. The learning curve generated during this adaptation is the threshold from where fraudsters can act undetected."

Security management

The rapid expansion of mobile services into a consumer environment that has not had the benefit of developing robust security protocols has meant that Africa has become the new focus for cyber crime. One of the most common security breaches is SIMbox fraud *(see 'Killing your billing' right)*. This isn't surprising as the continent now has close to a billion subscribers, making it a very attractive target for this kind of network fraud.

The cellcos are fighting back. For example, after being hired by Ghana's government to track the use of SIMbox fraud, Accra-based consultancy Afriwave Telecom revealed it had seized 300,000 SIMboxes which would have reportedly cost the country's operators more than USD100m in lost revenues. And in a bid to tighten how SIMs are obtained, in March 2016 MTN announced it would only process cards during working hours. In May 2016, the company will begin to further tighten SIM card security by requesting an additional phone number and an email address to verify identity before a module swap is authorised.

While the main types of mobile fraud in Africa are likely to revolve around illegal SIMboxes and terminations, Lopes warns that domestic fraudsters are becoming increasingly sophisticated, and the arrival of international fraudsters also now presents a major threat. "New types of fraud such as the 'Wangiri' attacks, false answer supervision and others [*see 'Killing your billing' below*], are occurring quite undetected. Africa's MNO's growth is attracting global fraudsters attention to a new market."

The vast market that the continent represents is of course commercially attractive for cellcos, and they also continue to innovate in order to provide competitive services to retain and gain subscribers. This has come at a cost, as such services are developing faster than the comprehensive security platforms that are needed to prevent fraud and cyber crime.

However as Andy Gent, founder and CEO of Revector, points out, most threats are the same worldwide and it really comes down to local

dynamics such as the termination rates. "Where these are high we see more SIMbox fraud. So for example in the US (where international interconnect is rare), SIMbox fraud is virtually non-existent – the opportunity is simply not there. This is also true within EU countries. But in Southern Africa, where there are many countries, the opportunities for termination bypass are much higher."

Fighting the fraudsters

With a range of security threats across the mobile space, mobile operators have had to be equally innovative when combating fraudsters.

Approaches vary and include post analysis of CDR data. These report-based systems detect anomalies across a network, looking for unusual patterns that could be fraud. They are however, only effective after the fraud has taken place.

What is really needed are systems that can learn an MNO's systems and use machine learning and even AI to identify potential instances of fraud. As MTN points out, networks will be subjected to continuous vulnerability assessments as threats will continue to evolve. Hitesh Morar, the group's executive of IT and innovation, says operators will have to continue to ensure robust processes are in place to continuously identify, prevent, detect, respond and recover from threats.

"The advent of new technologies and the shift to all IP networks and services, as well as the shift to cloud services, brings with it a new dimension in security requirements that were previously only prevalent in the internet world.

Miguel Lopes, VP product line management, Cataleya

"No operator is an island. African MNOs must quickly adapt to protect their own subscribers from domestic, continental and global fraud attacks."

"The rise of digital services, such as m-banking, m-commerce and online service, requires security that extends beyond just prevention of DDoS attacks and encryption, and also addresses message authentication, filtering and digital signing."

Understanding the kind of mobile fraud that is being perpetrated is only one element of a solution. As Jacqueline Fick, chair of the GSMA Africa fraud forum explains, a change in attitude is also needed: "Cyber crime activity has become more focused on mobile platforms. But we have noted that our mobile security mindset is still that of using a phone and not a sophisticated device that contains valuable information similar to that stored on our computers;

KILLING YOUR BILLING
In its 'Fighting Voice Fraud with Big Data Analytics' white paper, Cataleya identified the following common types of fraud for MNOs.

False answer supervision
Early answer is caused by one of the interconnect parties sending a false answer signal. This causes all the previous switches to start billing even when the called party has not answered the call.

Wangiri fraud
Also known as 'robot dialling + callback'. The objective of the fraudster is to call thousands of users and hang up after one ring. Unsuspecting mobile users will return the call paying a premium rate per minute to a number which will be heavily disguised as a local one.

International revenue share
Fraudsters take advantage of certain premium rate country terminations such as Somalia or Sudan, for example, and inflate traffic into these countries. The fraudsters can play a role in the origination side by gaining access to a fraudulent SIM or hijacking a PBX system, or on the termination side by colluding with content or IVR providers in the countries with premium termination rates.

PBX hacking
Cases are generic and involve the bypass of a legitimate carrier in the delivery path of the call. SIMbox fraud *(see below)* is a of a typical case here.

Another case is location routing number (LRN) fraud. This is where the fraudulent operator sneaks in a LRN via a low-cost route and then sends it to the wholesale provider where it tries to terminate the call to the indicated network. But the call does not go through, and a 're-dip' has to be done to the LNP server which provides the correct termination network on the

highcost route. The wholesale operator ends up bearing all the termination costs.

Subscriber identity theft (SIMbox fraud)
This is particularly rampant in countries with high numbers of incoming international traffic where SIM availability is loosely controlled and law enforcement is lacking. The fraudsters mainly use pre-paid SIMs where the ownership and address is hard to detect. There are many variations of SIMbox fraud and methods of detecting them therefore also vary.
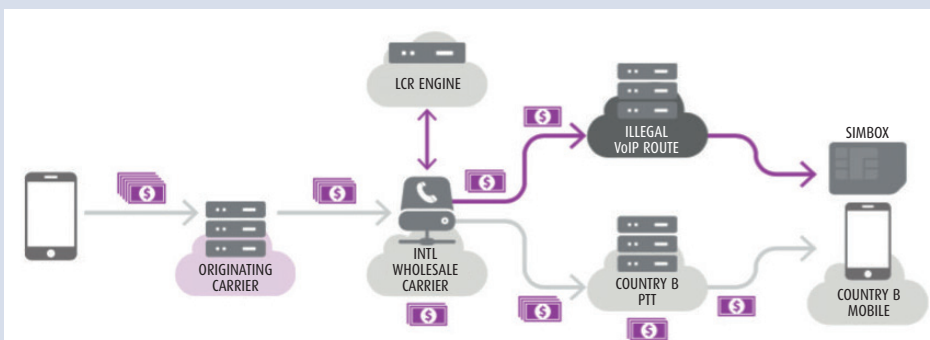
a device that has to be secured in the same way as we have now learned to do with our computers."

A change of mindset is only one component of developing a comprehensive approach to security. Carlos Marques, head of product marketing for business assurance specialist WeDo Technologies, also points to regulation: "Regulatory bodies can prove valuable in protecting against fraud, taking on a range of responsibilities including regulating prices, fighting against fraud and the fair distribution of telecoms revenue to different parties. However, due to the continual evolution of the industry, regulators need to be resourceful and forward-thinking to ensure they're able to successfully execute on their duties."

What is clear is that as the threats to mobile networks expand and increase in complexity, operators will have to move away from a general piecemeal approach to combating cyber crime in all its forms, to more integrated and intelligent systems. Here, cloud-based services are coming online from vendors that can offer an additional layer of protection to mobile networks.

Evolving threats

Clearly, the future will mean more security. But this must not be at the cost of eroding the services being delivered to consumers, as Simeon Coney, chief strategy officer with network security platform provider AdaptiveMobile, warns. "Carriers today are faced with the challenge of protecting the integrity of their networks, securing A2P messaging revenues, whilst future-proofing their investment in the next-generation of security architectures as NFV becomes a reality.

"Furthermore, there is an opportunity for carriers to play an important role in securing networks as we move closer to a hyper-connected future that requires new security architectures to protect 5G, IoT and beyond."

2015 saw near-exponential growth in all areas related to cyber security. In fact, Kaspersky Lab has seen a strong growth in detected threats in African countries. Dirk Kollberg, senior security researcher in the company's global research and analysis team, says: "The continued increase in threats and cyber security matters certainly shows that African countries are a growing target for cyber crime and, as a result, countries like Nigeria need to pay attention to this reality and the future trends and predictions in this space."

The massive growth of the mobile industry across the continent with new products developing means a multi-tiered approach to security is needed. New services mean new security threats as cyber criminals jump onto the next popular product to exploit.

"Africa is largely a pre-paid market and highly competitive on retail rates thereby challenging fraud resources to be on the constant lookout for arbitrage opportunities," says the GSMA's Fick. "LTE rollouts are accelerating, bringing increased demand for data and a host of new vulnerabilities associated with data environments."
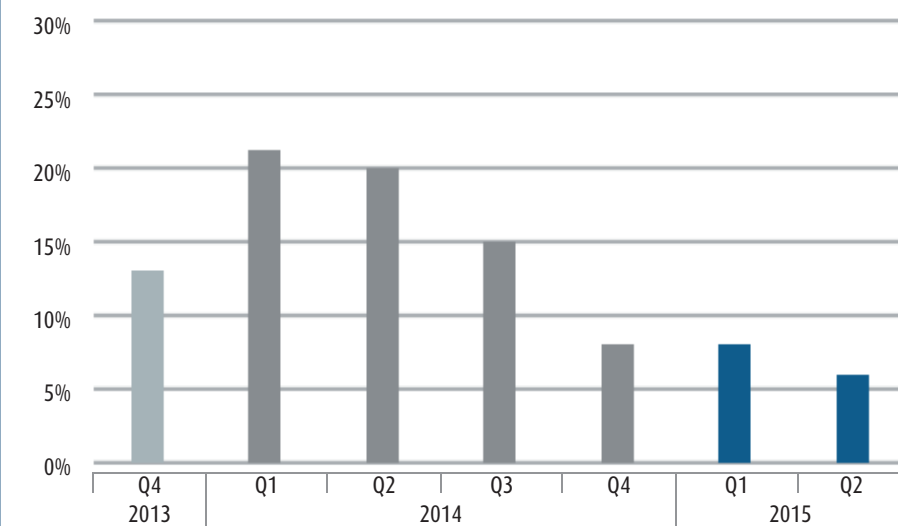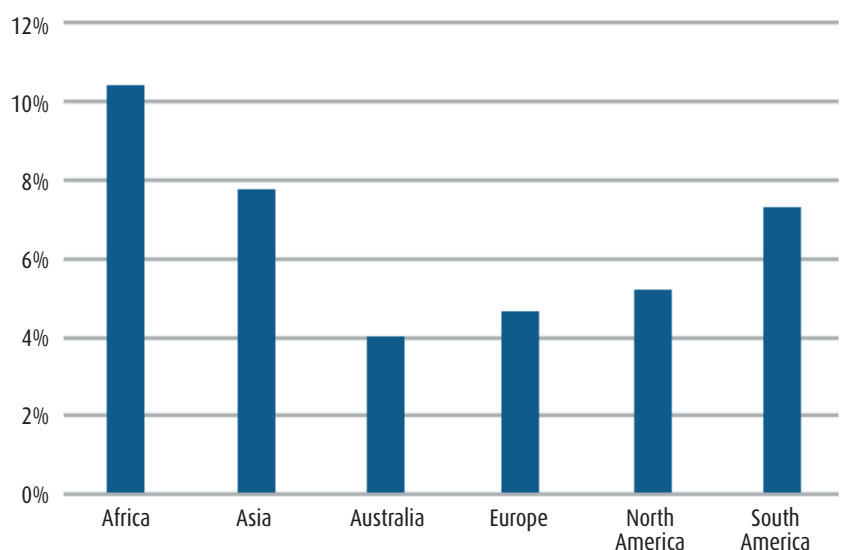
Top: Mobile malware infection rates declined about one per cent per region during the second quarter of 2015, with the exception of Africa which was unchanged and North America which dropped almost four per cent. Above: Global mobile malware infection rates. SOURCE: MCAFEE
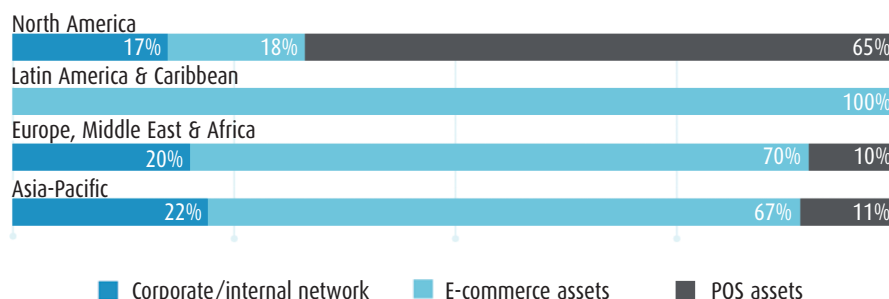
Distribution of forensics investigations by region and type of environment compromised. SOURCE: TRUSTWAVE

She adds that SIMbox and termination fraud will remain a concern in countries where the cost of terminating an international call is considerably higher than that of a national one.

So the challenge that Africa's MNOs face is two fold: they need to continue their programmes of network development as demanded by their subscribers, and roll out these services with robust security; but at the moment the security foundation that many of these services are built upon isn't as strong as it could be. The answer is likely to come from an integrated approach that includes new legislation, strong security protocols that can effectively combat cyber crime pre-emptively, and a change in attitude that places network security at the top of the mobile operator's agenda. ■

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Pleasing the crowd

The Government of Gabon chose wireless systems to support video surveillance for the Africa Cup of Nations.

With sprawling departments, local and central government organisations have broad communication needs. In many cases, only wireless technologies are able meet their challenges.

When the Government of Gabon needed to secure the Africa Cup of Nations it chose RADWIN's point-to-point (PTP) and point-to-multipoint (PMP) systems for mission-critical video surveillance transmission.

Established in 1997, RADWIN provides a full suite of wireless PTP, PMP and broadband mobility solutions, powering applications such as backhaul, broadband access, private network connectivity, video surveillance transmission as well as wireless broadband in motion for trains, vehicles and vessels.

Gabon and Equatorial Guinea co-hosted the Africa Cup of Nations in 2012, and Gabon has been chosen to host the tournament again next year.

Working with Magal Security Systems, the vendor supplied its *5000* PMP and 2000 PTP wireless systems in the 3.5GHz and 5GHz bands to help secure the games for the Government. RADWIN's systems relayed real-time high definition video from cameras installed within the stadium, the Olympic Village, and surrounding roads back to the central command centre.

As a result of using the company's wireless surveillance network, the government of Gabon was able to achieve the following results:
❖ Ensure the security of athletes and visitors who attended the games
❖ Keep the peace during the event which drew crowds in the hundreds of thousands
❖ Monitor all areas from one control centre and augment the reach of local police forces
❖ Increase detection and response times via live video transmission.

According to RADWIN, its equipment was chosen for a number of reasons. The firm says its systems deliver actionable surveillance information with high image quality in real-time as well as the highest capacity for video streams, enabling positive identification of individuals.

They are also said to offer the flexibility for installers to deploy links in any area where surveillance is needed, and with fast set-up times using wireless technology which eliminates the need to lay cable or dig trenches.

Other USPs for the systems are claimed to include uninterrupted transmission, even in urban zones where there are obstructions to direct line-of-sight; dedicated bandwidth per camera site with RADWIN's *5000* PMP; and an "extremely reliable and robust" network with zero video 'hiccups' or downtime.
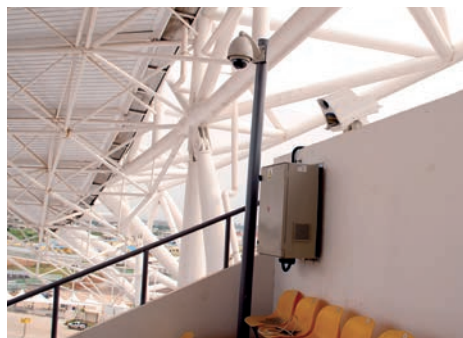
In Gabon, RADWIN's point-to-point/multipoint equipment was used to relay real-time HD video from cameras installed within the stadium.

Modernising ICT for African Union

As a large, political, international organisation, the 54-member African Union (AU) handles a huge volume of sensitive data, and holds hundreds of committee and agency meetings per year at its conference centre in Addis Ababa, Ethiopia.

The AU found that it needed a robust solution to streamline its conference operations and protect data from a variety of security threats. Traditional PCs were the backbone of the union's existing system, leaving it vulnerable to hackers, phishing and virus attacks, and data leakage and loss. And at 200W per PC, power costs were prohibitively high based on the large number of computers deployed.

There were also other challenges to overcome. The AU holds more than 600 meetings each year and translates the minutes for all of them into English, French, Arabic and Portuguese. Its system was inflexible and lacked computerised browsing capabilities. So if any changes to minutes or schedules were necessary, it meant significant labour and costs to get the amendment completed at short notice.

Furthermore, AU staff frequently travel and high-ranking officials often work from mobile offices. Information synchronisation, high client/server bandwidth needs, and general inflexibility plagued the union's old system.

The system also required constant upgrades. Maintenance personnel spent most of their time installing and configuring software and hardware and chasing faults. In addition, workers had to deploy

The African Union holds more than 600 meetings each year at its contemporary-looking conference centre and offices in Addis Ababa.

large numbers of PCs for attendees at large meetings on short deadlines. Costs shot through the roof.

In 2013, the union realised it needed a new solution and had to implement it within three weeks in order to meet the deadline for its major annual conference. It chose Huawei's *FusionCloud* desktop platform which offers computing, storage sharing, and resource allocation through cloud data centres. Huawei claims its system enables enhanced information security, conference efficiency, as well as reduced operations and management.

FusionCloud tackled the AU's challenges in several specific areas. All computing and storage resources for the solution were deployed to the AU's central data centre, enabling a seamless connection to the original IT system.

Huawei then installed Wi-Fi hotspots and says it provided the industry's first thin clients customised with Wi-Fi access. Without the integrated cabling of a non-Wi-Fi network, the vendor reckons the office environment is "more orderly". Users can easily access data, such as meeting minutes, through a virtual desktop on workstations equipped with only a monitor, keyboard and mouse.

In terms of security, the *FusionCloud* platform moves computer operating systems and applications to centralised servers in the AU's data centre, protecting data against attack and preventing data leakage from PCs. Thin client security measures, such as authentication and encryption, offer further security.

With centralised storage, Huawei says AU users can now seamlessly shift work locations without interrupting applications. Using mobile devices such as smartphones or tablets to access cloud-based applications and management systems, they can work any time and any where.

Having all resources stored in the data centre means centralised management and flexible resource scheduling is possible. According to Huawei, *FusionCloud*'s unified management model only takes three minutes for the entire process, from VM application to provisioning. It adds that installing software and patches are equally easy in the centralised environment. As a result, quick allocation and on-demand resource utilisation have soared while operations and management costs have dramatically fallen.

The AU has been able to realise several key benefits with the more modern technology. For instance, meeting minutes no longer need to be printed which saves work and money so

employees can focus on other tasks. The low-cost thin clients, configured with a display, keyboard, mouse and USB port, can wirelessly connect to various peripheral devices in central locations. Without all those wires, the conference centre is said to be more organised and comfortable.

The new system also consumes less power. Huawei says a thin client and display use around 70W and generate about 10dB of noise. As a result, there is much less noise while electricity costs are said to be more than 70 per cent lower.

Smart Transportation in Nigeria

Lagos is arguably one of the fastest-growing cities in the world, and is West Africa's leading commercial hub with the region's largest air and seaports. It generates around 25 per cent of national GDP and is also Africa's most populous city with around 20 million inhabitants. The population is expected to reach 40 million by 2030, but the capacity of the city's infrastructure is already very strained, and the roads in particular are in bad condition.

In June 2013, a team of IBM experts completed a month-long *pro bono* consulting assignment for the Lagos State Government to ensure that private traffic and public transportation flows more efficiently in the city.

Working with the Lagos Metropolitan Area Transport Authority – the agency responsible for developing and implementing the state's transportation blueprint – and the Lagos State Ministries of Transportation, Works and Infrastructure, Science and Technology, the IBM team proposed technology-driven strategies to make travel easier.

Located in West Africa's rain forest belt, 20 per cent of Lagos' 3,600km^2 area is mostly waterways. However, 90 per cent of commuter travel in the state is road-based. City authorities predict a 350 per cent growth in the number of vehicles in the state over the next 25 years, with the population doubling to 40 million by 2030. The potential of both rail and water transport remains largely untapped as they carry less than one percent of overall traffic in the state.

IBM's recommendations included better coordination between the agencies responsible for traffic management, police, fire and medical care. Informing the decisions of these departments would be data gathered and analysed from a variety of sources such as mobile phones, call centres, cameras, and GPS devices. More accurate and up-to-date information can help transport management agencies better manage the city's traffic flow. It will also enable them to wirelessly provide travellers with information such as road and traffic conditions, as well as bus, boat and toll schedules, to help them plan their trips more effectively.

Included among IBM's proposals was a single, integrated e-ticketing system for all modes of transportation (very much like New York City's *Metro Card* or London's *Oyster* card system) and integrated fare management.

The company said the introduction of roadway toll rates based on traffic density would also be helpful for encouraging the use of public transport,

Traffic jams in Lagos are notorious, and city authorities predict a 350 per cent growth in the number of vehicles in the state over the next 25 years.

cleaner air and enhanced revenue. Furthermore, the state was advised to create a single platform for all its traffic and transportation-related data so each agency and mode of transport is integrated, helping passengers interconnect seamlessly.

"Lagos will continue to be a significant patch of Africa's economic success story," said Taiwo Otiti, IBM's country GM for West Africa. "An intelligent, interconnected logistics and transportation management system is a crucial must-have for any modern city, and this engagement with IBM's *Smarter Cities Challenge* team will further enhance the state's ability to deploy technology-driven solutions in a timely and strategic manner."

The collaboration between Lagos and IBM was funded by a *Smarter Cities Challenge* grant – one of only around 30 awarded globally for 2013. Launched in 2011, IBM's *Smarter Cities Challenge* is a three-year, 100-city, USD50 million competitive grant programme.

Electrical department recharges network with DMR

Buffalo City Metropolitan Municipality is located in East London, South Africa. Its electrical department is responsible for the maintenance and repair of the electrical reticulation system for East London, Mdantsane, Bhisho and King William's Town areas. Due to the increasing size of the metropolitan area, additional staff and equipment were needed to carry out maintenance work

The department had been using a mid-band analogue radio system that comprised analogue equipment, repeaters, mobiles, base stations and portables from a variety of vendors. While the system had been in service for many years, it had become difficult to maintain and repair due to the lack of spares available.

Furthermore, the control room was utilising base stations on various channels and the required area of operation was limited. The existing analogue system could not support more users, and was already hampered by too many group conversations as well as individual conversations.

With its expanding workforce, communication and management efficiency was becoming more critical for Buffalo City's electrical department. Its challenge was to find a digital two-way radio system that offered more than just a bunch of new walkie-talkies. What it needed was a control

Buffalo City Metropolitan Municipality is migrating from analogue radio to digital with the help of Hytera's dispatch system (left) and its wall-mountable RD62X repeaters (right).

room that offered dispatching software as well as recording and GPS functionality.

During 2014 to 2015, local systems integrator M.H. Communications supplied a Hytera DMR conventional network. The system includes an advanced dispatching and tracking solution, along with the vendor's dispatch software, repeaters *PD78XG* portables and *MD78XG* mobiles.

Five Hytera *RD62X* VHF repeaters are linked to eight dispatch systems. The wall-mounted repeater can be easily fitted into the control room and is said to offer a space-saving solution.

Each client using the dispatch system operates individually and communicates to the relevant repeater area. Hytera says the audio link feature in its dispatch system allows the repeaters to be linked as required, allowing communications between areas. It adds that if the link is not required, it can be disconnected to reduce traffic on the repeaters.

According to Hytera, its digital radio solution makes communications possible in places where the electrical department's analogue radio system does not work. Some sites are also equipped with digital and analogue repeaters connected back-to-back in order to communicate with sub-contractors who are still using analogue radios. Two *RD62X* repeaters are used in such cases, one in digital mode and the other in analogue.

Hytera says this back-to-back solution operating in different modes between the same repeater models enables a smooth upgrade from analogue to digital for the department and also saves costs as during this process the digital radios can communicate with the analogue devices.

The digital solution and dispatch system has greatly improved Buffalo City electrical department's operation efficiency.

Thanks to the DMR conventional multi-sites IP network, all the repeaters create a much larger communications range, ensuring that technicians can communicate throughout the whole area.

Staff are using terminals with GPS which greatly assists the reaction time of technicians and results in cost savings. The company says the dispatch system also enables the organisation to easily see where its technicians are at all times, which avoids unnecessary dispatches and improves work efficiency.

The system's recording and reporting functions are also said to have significantly improved the way the department conducts its daily businesses. For instance, with the platform's short data message feature, address and contact number

details can be sent directly from the dispatcher to the responding technician's radios.

Dean Trollip, technical project manager of the electrical department, says: "The system has allowed us to incorporate all our communications systems, namely our telephone systems and radios system, into one console. [This] allows all staff to deal with all radio and telephone calls on one platform, thereby avoiding using multiple systems separately."

Metro network

Opened in 2010, the Gautrain rail network serves the South African cities of Johannesburg and Pretoria, including O.R. Tambo International Airport. The network connects 10 stations and comprises 80km of track of which 18km are underground.

Working in collaboration with Roodepoort-based Radio Network Solutions (RNS), distributed antenna systems specialist Axell Wireless (now part of Cobham) designed, supplied and implemented a safety radio network system into the complete tunnel and underground station network.

The company says that in underground locations that are heavily used by the public, robust wireless networks are crucial for the provision of continuous communications during emergencies. However, with new standards and regulations changing the public safety network landscape, the technology that is chosen has to continuously evolve to keep pace.

To meet the high reliability requirements of the Gautrain tunnel and station network, RNS deployed a radiating cable (leaky feeder) system. Using this method, the Gautrain system required two fibre optic master sites using Axell's *Optical Master Unit (OMU II)* and 22 remote units.

Each remote unit is placed at an underground station and emergency shafts, and connected through optical fibres. Leaky feeder cables then run from the remotes providing coverage inside the tunnel itself.

According to Axell, the use of these repeaters allows base station coverage to be boosted and extended over great distances to remote locations. As a result, it eliminates the issues associated with continuous communications underground.

The company adds that reliable public safety system must continue performing despite any failures to the system itself. This problem is solved by providing a fully redundant design underground. Each base station is configured to feed several repeaters, and overlapping coverage exists between two adjacent repeaters. If one, the repeater sited next to it will provide ongoing coverage.

Additionally the system has a dual fibre feed to each remote location. This means that, if one master site location fails, or if the fibre optic cable becomes damaged, the remote repeater will switch its feed to the other master site.

As a result, the system has both overlapping and dual fibre optic feed redundancy. It satisfies the requirement for critical resilience, ensuring that there are no coverage black spots for the emergency services which is of vital importance.

As a fully redundant system, the comms network will continue to run through overlapping coverage between stations if any part of the system fails. This comprehensive wireless network meets stringent safety standards, and is underpinned by automatic single level control. This is integrated into the system, so in the event of any failures the signal will still be carried.

Axell says the network is also easy to extend. Providing radio frequency over fibre makes the network flexible to upgrade and offers the ability to add to it when expansion is needed. The company claims its solution is also future-proof with technology that is flexible and adaptable. It says this gives public safety operators the flexibility to specify and change sub-band allocation, and provides an easier path to new standards in the future. ∎

PHOTO: BOMBARDIER

The Gautrain network connects 10 stations and comprises 80km of track of which 18km are underground.

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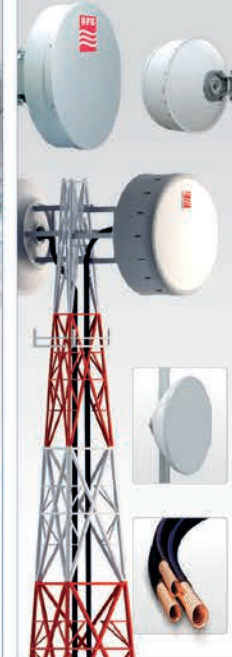15-17 November 2016, Cape Town, South Africa
booth A1

New heights in connectivity

Operators such as ABS, Avanti, Eutelsat, Intelsat, Spacecom and Yahsat have either launched HTS platforms for Africa or plan to do so soon. Hughes will launch its own *EchoStar XIX (pictured)* this year although its beams will not point to the region.

Do HTS platforms now represent the future for satcoms in Africa? DAVE REHBEHN reckons that when it comes to solving the region's connectivity problems, we should all look to the skies.

When it comes to the market for satcoms, Africa has been long on potential but short on results for decades. Its populations, huge distances, and limited fixed and mobile terrestrial infrastructures create ideal conditions for the technology to take hold. In addition, there is growing demand throughout the continent for applications such as distance learning, DTH, internet services, video distribution, enterprise networking and cellular backhaul.

However at the same time, the economic constraints of conventional satellites have limited deployment of satcom services in many geographies and application areas. The cost-per-bit delivered by conventional satellites is often too high to support affordable data plans in many areas, in particular making it difficult to meet consumer demands for throughputs.

High throughput satellite (HTS) infrastructure globally is rapidly expanding with the launch of geostationary orbit satellites across all continents. And within the next five years, they will include global LEO (low earth orbiting) and MEO (middle earth orbiting) constellations.

Availability of high capacity, lower priced bandwidth will fundamentally change the cost paradigm, and will undoubtedly help turn Africa's enormous untapped potential into reality. HTS' lower cost of delivering Mbps is the key to substantially increasing the range and quality of services available to consumers and businesses who are currently on the far side of the digital divide.

Africa's HTS growth

The number of providers investing in African HTS capacity is the best testimony to the technology's potential. The continent already has significant HTS capacity and can expect a steady increase

over the next several years with the launch of new GEO satellites as well as global MEO and LEO projects such as O3b and OneWeb [*see News, Jun-Jul 2015 issue*].

Yahsat and Avanti are the major HTS service providers in Africa today. Both are planning to add HTS bandwidth in 2017. Yahsat's *Al Yah 3* is expected to be operational in early 2017, extending more high throughput capacity to countries throughout Africa. Avanti's *HYLAS 4* is on track to be launched during the first quarter of 2017, further extending the company's coverage of the continent.

Other providers are moving aggressively into the region's HTS market. For instance, Arabsat launched *BADR 7* in November 2015, and Spacecom is scheduled to bring on additional capacity this year with the launch of *AMOS 6*. Facebook and Eutelsat (partners in the former company's Internet.org venture) have purchased the entire HTS capacity on *AMOS 6* to provide internet access to various regions of sub-Saharan Africa (*also see News, p5*). Eutelsat has also ordered another HTS to service the region which is expected to be launched in 2019.

Meanwhile, Intelsat's *Epic IS-33e* is coming online in 2016. Gilat Satcom is already offering HTS-priced Mbps plans on conventional satellites to spur demand for high throughput services on Intelsat's *Epic* platform. While much of the planned HTS capacity for Africa is in Ka-band, *IS-33e*'s capacity will be implemented on Ku-band. This will enable current users of Ku capacity to easily migrate onto more cost effective HTS payloads.

HTS advantages

High throughput satellites are designed and optimised for data communications. They achieve very high capacities by utilising small spot beams and extensive frequency reuse.

Conventional satellites employ wide-area beams – as much as several hundred kilometres across. Conventional satellites were really designed and optimised for video broadcast which is why, when used for data communications, they typically yield capacity of only several Gbps. A large HTS dedicated to data can deliver hundreds of Gbps over a wide area at a lower cost per bit than a conventional satellite.

As satellite operators replace their fleet, a common practice is to add an HTS 'payload' onto their new spacecraft. The capacity of these payloads typically range in the tens of Gbps, and enable the satellite operator to incrementally introduce HTS capacity into its service region. This also allows the operator to effectively serve

Dave Rehbehn,
VP international division,
Hughes Network Systems

Satellite has a variety of applications in Africa. For example, Hughes' technology has been used to connect schools (1) as well as bring voice connectivity (2). In the DRC (3 and 4), it is being used deliver cellular backhaul services for a major operator in the country.
DRC PHOTOS: SUSAN SCHULMAN

the data market segment with the HTS capacity, and the more conventional video and enterprise markets with the conventional capacity.

HTS has several technical advantages over conventional satellites. The cost per delivered bit is lower as the satellite itself will deliver much more capacity while roughly having the same price as a conventional satellite. In addition, its powerful spot beams enable smaller antennas and radios. This lowers the capex cost per VSAT. HTS' higher capacity enables service providers to offer service plans with throughputs of multiple MBps and multiple GBs of monthly capacity.

However, some of those capabilities come at a price. HTS smaller spot beams are less effective for multicasting than the broad beams offered by conventional satellites. Similarly, large distributed enterprises that could be served with a single conventional satellite beam might require several HTS beams to link all of their facilities.

HTS network architectures can also pose regulatory issues for applications such as satellite backhaul. HTS gateway stations are often not located in the countries where cellular traffic originates – many national regulators require all cellular traffic to be routed locally. Similar issues can arise when bringing enterprise traffic back to headquarters.

The outlook

HTS is clearly on the near horizon to expand Africa's addressable satellite market. It is the crucial missing piece in the elusive goal of

connecting the entire continent, providing the price-to-performance ratio satcoms need to offer viable services to business and consumers.

The technology's potential impact on Africa's satellite markets rides largely on the target application or vertical industry. Those with the greatest potential for the region include:
❖ Internet access, including digital divide projects as well as Wi-Fi hotspots
❖ Cellular backhaul
❖ Government health, education and economic development projects, as well as classic enterprise including banks mobility and aviation

Undoubtedly, wherever HTS capacity is available, it will be the most cost-effective alternative for satellite internet access.

The choice of HTS service for cellular backhaul, as well as enterprise traffic, will depend on whether the available capacity can land the traffic within the original country of each service provider. If not, then conventional capacity will be used for cellular backhaul because of its ability to always land the traffic within the country of origin, versus routing through a gateway located in another country.

Mobility services – aero, maritime and land – will likely require a hybrid combination of satellite and terrestrial wireless capacity, with economics of HTS capacity favouring it over conventional, though the latter will fill gaps in HTS coverage.

With HTS capacity growing year over year, high-speed satellite internet service will soon help close the digital divide across most of Africa and change lives for the better. ■

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Mobile system provides remote communication

Researchers at Flinders University in South Australia say they have developed a highly secure mobile system to help emergency service units in remote areas that lack cellular networks or internet access.

The team behind the *Serval* project have come up with a mesh extender that runs on USB power and acts as a Wi-Fi hub or transmitter, and a free app for *Android* devices.

Project leader Dr. Paul Gardner-Stephen explains that a user's smartphone connects to the hub via Wi-Fi. The hub can can then link to others using Wi-Fi as well as long-range VHF radio that can go many kilometres under ideal conditions. "The combination of these things creates networks that can cover large areas and people without requiring any infrastructure at all," said Gardner-Stephen.

The aim of the project is to give the *Serval* mesh extenders to emergency relief teams in disaster situations so they can establish communication channels in remote areas. Those who did not have the app in times of crisis could download it with the help of the extender and have it ready for immediate use.

Serval was developed in conjunction with the New Zealand Red Cross with further support coming from the NICER project in Germany. It will undergo further

The *Serval* mesh extenders can be used by emergency relief teams in disaster situations so they can establish communication channels in remote areas.

pilot tests over the next 18 months ahead of its first large scale rollout in the region. The team is also working with Toyota and Saatchi & Saatchi to fit off road vehicles with emergency communications hotspots.

VAST mall Wi-Fi network deployment

VAST Networks has successfully deployed what's said to be the largest shopping centre Wi-Fi installation in Africa. The company says consumers and retailers can now benefit from "a reliable and fast Wi-Fi experience" throughout the 130,000m² Mall of Africa in Johannesburg which opened towards the end of April.

Formed last year, VAST Networks brought together the Wi-Fi assets of South African internet service providers MWeb and Internet Solutions, and claims to be the first open-access network provider in Africa.

VAST Networks CEO Grant Marais said Wi-Fi on this scale has never been delivered before in Africa.

The company collaborated with partners including Ruckus Wireless on the Mall of Africa deployment. They planned the rollout for more than a year, with technicians working on the site for nearly six months to make sure the Wi-Fi network would work without any glitches once the mall opened for business.

VAST said the teams installed more than 1,000 "highly advanced" APs together with the network backbone to deliver a solution that could not only handle the capacity requirements of more than 300 shops and thousands of anticipated daily visitors, but also cope with ever growing data demand.

VAST Networks CEO, Grant Marais, added that a deployment of this scale is a "massive undertaking by world standards and an African first".

Experimental sub-1GHz licenses prove auctions are "misguided"

The Indian Government will issue eight experimental licenses in the 470-582MHz band to enable network trials based on TV white space-like rules and regulations already adopted in other countries such as Malawi, Ghana, Singapore, the Philippines, the UK, as well as in North America.

The government's decision has been welcomed by the Dynamic Spectrum Alliance (DSA). It said that in most parts of India, more than 100MHz of available spectrum in the 470-582MHz band is unused, even for analogue TV transmission by the country's single terrestrial broadcaster, Doordarshan. In ITU Region 3, which includes India, 470-582MHz spectrum can be used for fixed, mobile and

DSA executive director Prof. Hyacinth Nwana said 470-582MHz spectrum is key to bridging India's digital divide.

broadcasting services as competing 'primary services', and for other non-interfering uses on a 'secondary basis'.

DSA executive director Professor Hyacinth Nwana said: "The 470-582MHz band will be key to bridging the digital divide in India, a country with more than 800 million people who are not connected to the internet, 68 per cent of which are living in rural areas."

The DSA said the move will create opportunities for the use of sub-1GHz

spectrum in India in either an unlicensed or lightly licensed fashion without the need for auctions. It believes that the "school of thought which claims all spectrum must be auctioned is not only limiting, but also misguided".

The alliance added that TV white space (TVWS)-type regulations also have a clear legal basis in India, as evidenced by a recent Supreme Court decision that auctions are not the only permissible method for distributing spectrum.

"Under the Supreme Court's edict, spectrum such as TVWS or 5GHz, could be allocated on a license-exempt or unlicensed basis as long as such a policy is 'backed by a social or welfare purpose', such as using connectivity to increase social and economic inclusion," stated the DSA.

Smart street lights will use M2M

Philips Lighting has appointed Vodafone as its global IoT managed connectivity partner. Under the deal, the two firms will enable city authorities worldwide to implement smart street lighting systems which will be connected wirelessly, saving energy and making maintenance easier and more efficient.

The Philips *CityTouch* street lighting management system will use Vodafone's machine-to-machine network to connect individual light points, and every connected street lamp will contain the operator's M2M SIM. Vodafone says city authorities can then monitor and manage lighting through a "user-friendly and highly flexible" system while engineers will be able to check performance, identify faults and control the lighting remotely.

According to the partners, their offering allows authorities to create an infrastructure that is easily scalable, and will be able to support other smart city applications in future.

Bill Bien, SVP, head of strategy and marketing at Philips Lighting, said: "We are at the start of a new era which will see highly energy efficient connected street lighting become the backbone of most smart cities. Robust, reliable wireless connectivity will help make this happen, linking streetlights with sensors, devices and management systems."

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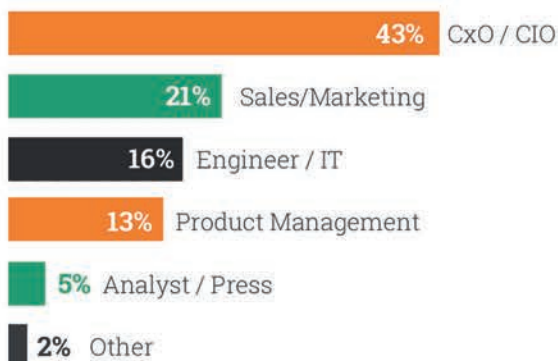
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QoS Telecom to provide internet on Transdev buses

France-based Wi-Fi specialist QoS Telecom will deploy and operate internet services on board buses for Transdev. It will use LTE gateways from Sierra Wireless as well as the vendor's management system.

QoS Telecom says it currently manages hotspots that provide on-board Wi-Fi services to more than three million people in Europe.

The company claims its *WiFi On Board* solutions provide value-added services such as location-based services, real-time marketing, custom login pages and a pooling solution with business applications (such as traveler information, ticketing and video surveillance systems, for example).

According to Sierra Wireless, transit authorities such as Transdev are turning to the Internet of Things to connect buses and support new applications that improve the passenger experience.

The vendor claims its *AirLink* gateways can be deployed out-of-the-box with no programming requirements and are built with embedded intelligence to always stay connected. It adds that nearly two million of its gateways are deployed globally in transit, first responder vehicles and commercial fleets.

QoS Telecom will also use the secure, cloud-based Sierra Wireless *AirLink Management Service* to monitor the gateways in real-time and remotely manage the deployment.

Jason Krause, SVP and GM of enterprise solutions for Sierra Wireless, says: "Managing a fleet of mobile gateways can be a challenging task. You need to maintain multiple configurations, update software, and remotely diagnose reported issues. With our *AirLink Management Service*, customers can easily handle all of these tasks, while efficiently managing operating costs."

Arianespace prepares Bank Rakyat's satellite

Preparations are under way for the launch of a new satellite developed by Bank Rakyat Indonesia (BRI).

At the time of writing, *BRIsat* arrived in French Guiana on 9 May. Its environmentally-controlled shipping container was then transferred by road to Arianespace's spaceport to undergo processing in the payload preparation facility.

Together with US orbiter *Echostar 18*, *BRIsat* is scheduled for launch on flight VA230 in June. Once it begins operations from 150.5ºE, *BRIsat* will serve as a dedicated relay platform for banking connection services across the Indonesian archipelago.

BRIsat will have a 36 x 36MHz C-band and 9 x 72MHz Ku-band transponders. Its service will reach Indonesia and ASEAN countries, East Asia (including most of China), most Pacific (Hawaii), and Western Australia.

In early May, *BRIsat* was unloaded from a Antonov An-124 jetliner at Félix Eboué airport in French Guiana.

The satellite will be owned and operated by BRI, which was established in 1895 and is the Indonesia's oldest bank. It has more than 9,800 branches throughout the country but many of them cannot be economically reached by terrestrial infrastructure. As a result, satcoms serve as both the primary and backup means of communication for the bank.

BRI is currently leasing capacity from nine satellite service providers in Indonesia. The bank first announced plans for its own satellite three years ago as it wants to expand into more of the country's remote and rural areas.

Brasilia Metro opts for Teltronic TETRA

Sepura Group subsidiary Teltronic has been selected to provide a complete communications solution for Brasilia Metro.

The deployment is part of an ambitious project by Metrô-DF to modernise and expand the Brazilian capital's transport network. It will feature Teltronic's *Nebula* TETRA infrastructure, a CeCo-TRANS control centre, *RTP-300* on-board equipment, *STP9000* hand-portable radios, and *SRG3900* mobiles.

The solution replaces the metro's ageing analogue system and aims to improve coverage as well as enhance communications between drivers, station staff, the control centre and passengers. It will cover Line 1 which currently carries 160,000 passengers per day but that figure is set to increase as a further five passenger stations are added under the expansion project.

"We are confident that this TETRA system will optimise critical communications within the network, augmenting the security of both our passengers and our employees," said Daniela Diniz, director of the technical board, Metrô-DF.

Unique 'RAN' helping to protect rhino

In what's believed to be the first technology solution of its kind, Cisco and Dimension Data have teamed-up on an initiative aimed at dramatically reducing the number of rhinos being poached in South Africa.

As part of the *Connected Conservation* project, the two companies are deploying a sophisticated monitoring system in a private game reserve adjacent to the Kruger National Park to track individuals from the time they enter until they exit.

During phase one, which has now been completed, Cisco and Dimension Data gathered information from the game rangers, security personnel, and control centre teams. They then installed

However they gain entry, any rhino poachers entering the reserve illegally will be caught out.

wireless hotspots around key points to create a secure, point-to-point radio 'Reserve Area Network' (RAN) using Cisco's Wi-Fi and LAN technology combined with Dimension Data's range of remote network monitoring, routing and switching, and managed services.

Phase two will incorporate CCTV, drones with infrared cameras, thermal imaging, vehicle tracking sensors, as well as seismic sensors on a highly secure intelligent network. Information is collected on every individual entering the reserve. This includes biometric data, along with the scanning of ID numbers and visitor passports, and the capture of vehicle registration plates.

Dimension Data says that over time the solution will be replicated in other reserves in South Africa and beyond, and will help protect other endangered species including sea creatures.

LTE-APro in Namibia

Namibian operator MTC has claimed a first in Africa with a 4.5G trial. During a closed session held in mid-April attended by the country's president Dr. Hage Geingob, MTC worked with Huawei to demonstrate 4.5G or LTE-AdvancedPro. Compared to 4G, the vendor says 4.5G has much better network performance in terms of bandwidth, capacity and latency, and will allow for speeds of up to 1Gbps over mobile and latency of less than 10 milliseconds. It adds that 4.5G will be better for developing the IoT with its ability to support up to 100,000 connections per cell.

PCCW MEF certified

PCCW Global has become the world's first service provider to receive MEF 100G CE 2.0 certification for E-Line and E-Access services. The Metro Ethernet Forum says certification represents a milestone for the industry, as the previous upper limit for CE 2.0 services certification was 10G per second. PCCW Global's newly certified service is based on network equipment supplied by Huawei which is one of the first six technology vendors to offer 100G CE 2.0 certified equipment.

Congestion awareness

Ireland-based BSS specialist Openet says it has deployed the world's first 3GPP RAN Congestion Awareness Function (RCAF) for a tier 1 North American operator. The unnamed telco is using the solution to help intelligently manage and reduce congestion across all its networks. Openet's *Congestion Management Solution* will act as an RCAF, enabling the operator to receive notifications from network probes, detecting those subscribers who are contributing most to cell site congestion.

# Tier 1 telcos launch Bay of Bengal Gateway

The *Bay of Bengal Gateway* (*BBG*) cable system has now gone live. The construction of the 8,000km network began in 2013. It was built by a consortium of Tier 1 operators to link the Indian sub-continent, Middle East and Far East.

The *BBG* is a three fibre pair cable based on 100G DWDM coherent technology with an overall design capacity of 10Tbps per fibre pair. It aims to enhance international connectivity into and out of six countries via landing points in the UAE (Fujairah), Oman (Barka), India (Mumbai and Chennai), Sri Lanka (Mt. Lavinia), Malaysia (Penang) and Singapore where POPs have been installed at Equinix and Global Switch.

The consortium behind the system includes the Vodafone Group as the lead investor, Dialog Axiata, Etisalat, Reliance Jio Infocomm, Omantel and Telekom Malaysia. They claim the *BBG* offers a unique combination of benefits such as: the lowest cost landing in India; diverse, protected routing from Penang to Singapore, avoiding the "high-risk" Strait of Malacca; and the first subsea system to offer 100G from day one.

The *BBG* is also said to offer "seamless and highly cost-effective" interconnection with existing systems
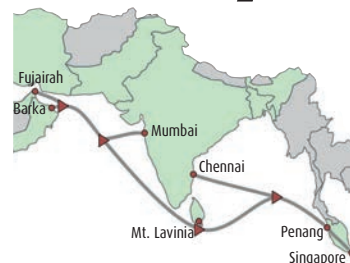
The 8,000km Bay of Bengal Gateway aims to enhance international connectivity into and out of six countries.

into Europe such as the *EIG* (*Europe India Gateway*), *IMEWE* (*India-Middle East-Western Europe*), and *EPEG* (*Europe-Persia Express Gateway*).

M1 launches Singapore VoWiFi trial

M1 has launched Singapore's first public Voice over WiFi (VoWiFi) trial with full seamless mobility, using a heterogeneous network (hetnet). This follows another deployment of hetnet technology to support its *WiFi-On-The-Go* service earlier this year.

M1 began its VoWiFi trial at the end of April. It said that unlike OTT calling apps which only allow calls between handsets with the same calling software, its service also enables calls to and from fixed numbers.

In addition, M1 VoWiFi supports two-way mobility between Wi-Fi and mobile networks. The operator said that this means that a voice call

M1 is using hetnet technology from Parallel Wireless as part of its *WiFi-On-The-Go* service on buses in Singapore.

initiated on a Wi-Fi network will not disconnect when the user moves to cellular network or vice versa.

The trial is part of the Infocomm Development Authority of Singapore's vision of connecting the whole nation under its 'Smart Nation' initiative. It is available to users of its hetnet trial sites within the Jurong Lake District.

Earlier in April, M1 deployed what's claimed to be the world's first NFV-enabled hetnet technology for use on-board buses. As part of its *WiFi-On-The-Go* service, the operator is using technology from Parallel Wireless.

The US-based vendor claims its system offers "pervasive" mobile coverage using real-time orchestration and traffic prioritisation made possible by the *HetNet Gateway*. All bus passengers receive seamless, high throughput connectivity from an on-board multi-mode LTE/Wi-Fi small cell with integrated backhaul, including licensed assisted backhaul.

Emcom sets up DMR system in Lesotho

The Lesotho Electricity Company (LEC) is using a nationwide digital mobile radio (DMR) system, designed and deployed by South African-based PMR specialist Emcom Wireless.

Prior to implementing DMR, LEC's communication system was said to be not only costly but often cumbersome. The company used a combination of standalone analogue repeaters, cellular systems and landlines for communications between its management, centres and field staff that are all scattered across the mountainous kingdom.

LEC's GM Seitlheko said: "When a problem arose in the field, it often took several days to get a maintenance team to pinpoint the location on the grid and a further couple of days to get communication to head office to despatch a team with the correct spares for repair."

Emcom's project team, led by sales director Tony Sibanda, began by carrying out a detailed field study that involved extensive travel across the entire country. Sibanda said: "Our initial scoping days involved trekking up some of the wildest terrain in Africa in search of suitable summits to mount repeaters, and we had to face snow, lightning and rain as challenges

in determining the best locations."

This gave Emcom a valuable insight into what LEC needed as a solution. It selected DMR Tier 3 products from Tait Communications, and then spent a year designing, building and testing the system under different conditions.

One notable aspect of LEC's DMR network is its integration with a RediTALK dispatcher loaded with *Google Maps*. This enables the operations team at head office to have real-time location visibility of all radios and vehicles on the network, talk to specific radios when required, and monitor elements all on one screen.

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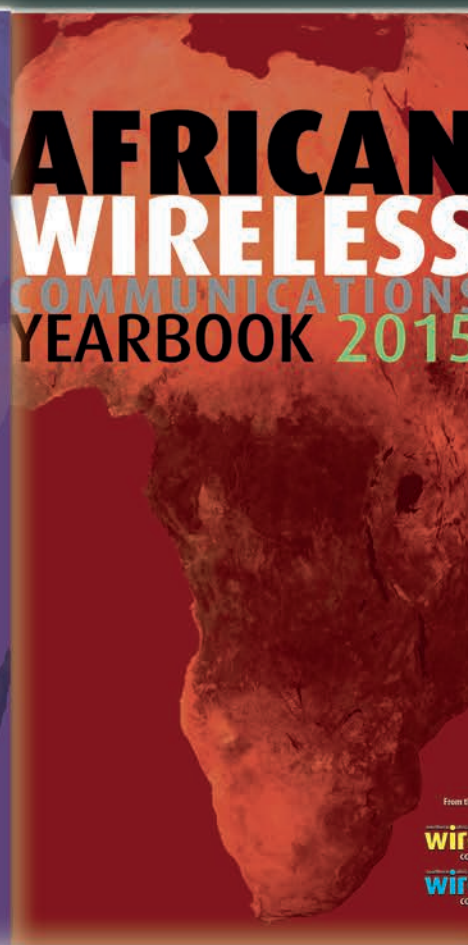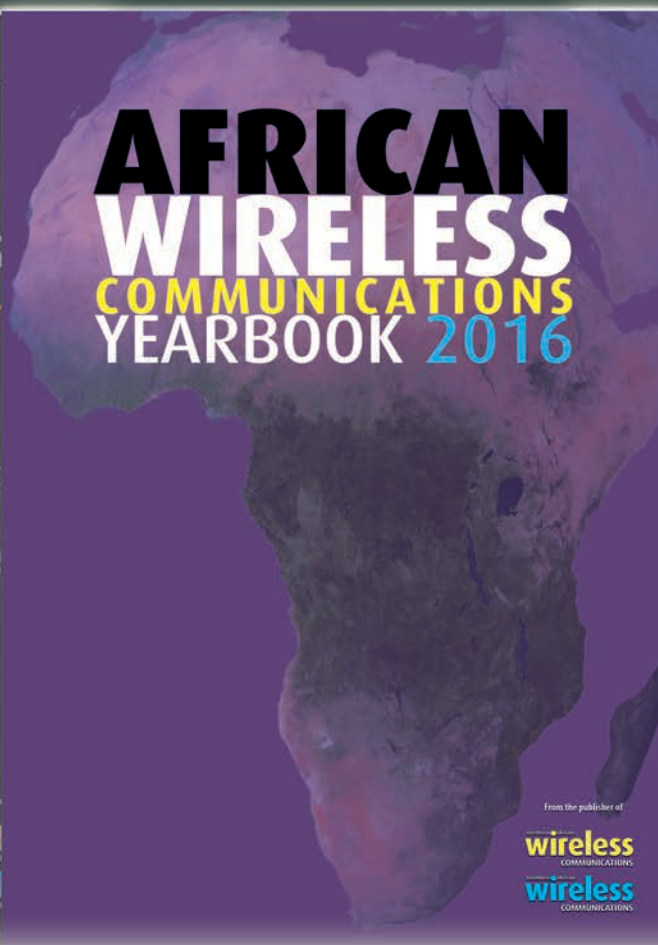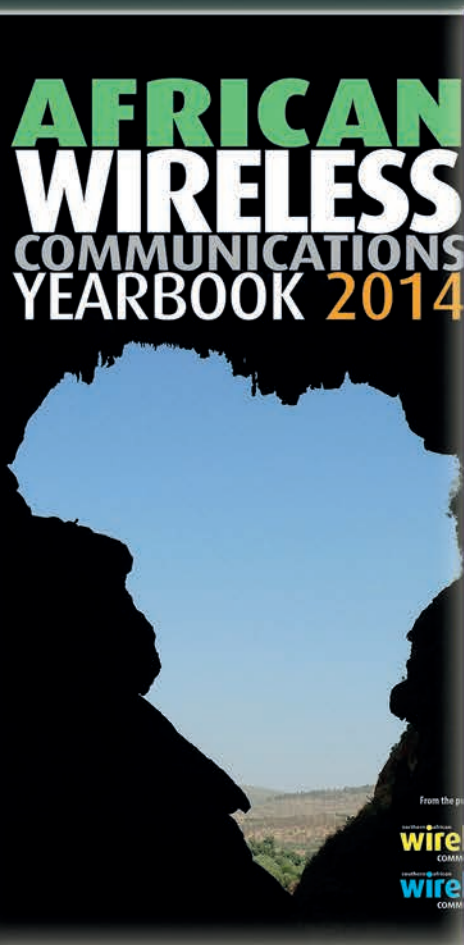
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