chapter 8 Wireless Users

Cellular

Nokia helps Vodacom Tanzania deliver the need for speed

Nokia Networks claims its 4G deployment for Vodacom Tanzania represents one of the most "significant" developments of a commercial LTE network in Africa, and says it continues to show "outstanding performance" since going live last year.

Vodacom has used FDD-LTE for its 4G network in Tanzania which went commercial on May 2016. While it was not the first to be deployed in country, Nokia reckons it was certainly the "most impressive". The company deployed 278 sites in less than three months across Dar es Salaam which then offered blanket coverage from day one – unlike the less than 60 sites offered by competitors, said the company.

Furthermore, Vodacom Tanzania's network is open for every subscriber who has a 4G capable device and is therefore not restricted just to selected subscribers.

Nokia believes Vodacom's LTE network is triggering a "massive change" in the country's mobile market. "So far, all operators offering 4G connectivity were covering just a part of Dar es Salaam," it said. "Some were actually deploying WiMAX and calling it 4G, which is not wrong, but they're relying on the power of 4G marketing for effect rather than for its real performance."

The vendor added that the network consistently offers a peak rate above 70Mbps *(see graph, below)*. "It is by far the fastest mobile broadband access network in Tanzania with outstanding QoS. Vodacom TZ is ready for a massive 4G adoption in Dar es Salaam as coverage and capacity were thought big from day one."

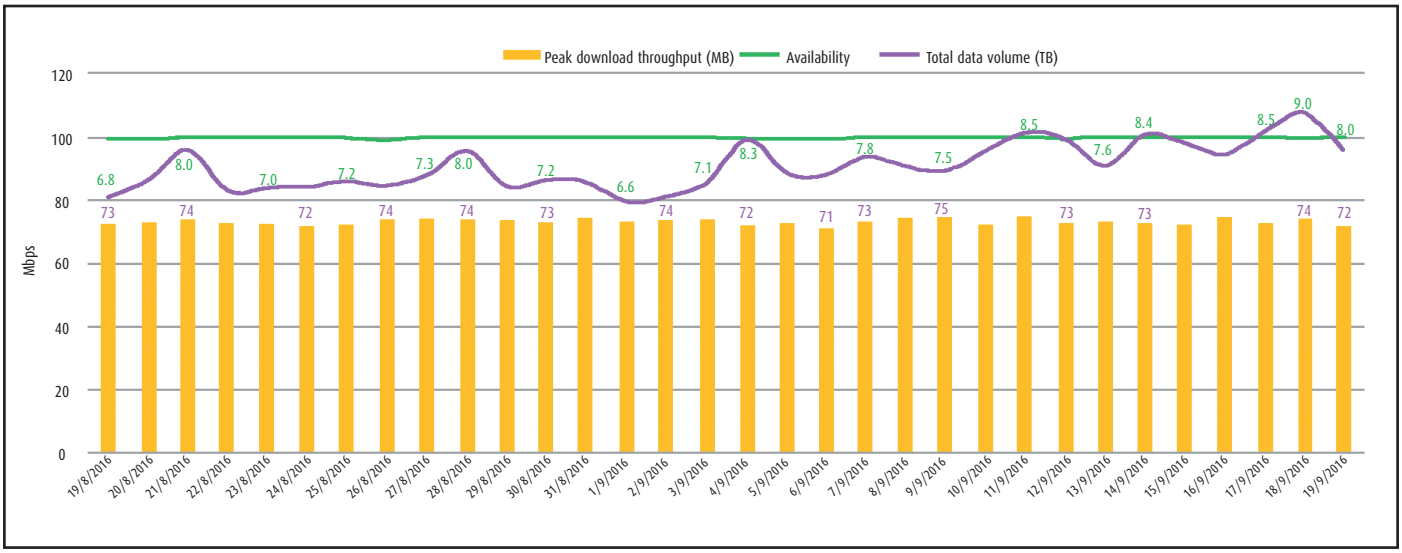
Nokia continued by saying customers can enjoy "stable, continuous and real" 4G access. It said the network has been progressively loaded with more than 13TB handled every day without quality degradation. The average throughput is said to be "stable and very strong" with a peak download throughput consistently above 70Mbps.

Network availability is reported as being more than 99.8 per cent on average in Dar es Salaam which basically has blanket coverage. "In other words, any Vodacom Tanzania subscriber in Dar es Salaam can download any internet page in less than two seconds," said Nokia.

4,400 subscribers apparently adopted the operator's 4G service during the first week of its launch. Nokia said this was more than some of the local MNOs who had already been offering 4G services for more than a year. More than 100,000 users are now said to be using the service.

According to the firm, all major cities in Tanzania can expect to have Vodacom's 4G network rolled out soon, while the rest of the country will start to benefit once spectrum is released by the regulator.

"*Hapa Kasi Tu!* (Swahili for 'it's all about speed') is the slogan for Vodacom TZ's LTE marketing campaign," said Nokia. "Vodacom and Nokia Networks are partners to ensure that the best of the 4G LTE technology reaches Tanzanian subscribers."



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RascomStar – adapting to the "system of life"

RascomStar was established as a private company in Mauritius 15 years ago. It claims to be unique in that its service and product focus is "precisely geared" to meet the needs of the continent.

By developing and deploying satcoms infrastructure across Africa, RascomStar provides national and international connectivity to supplement licensed telecom operator networks. It says its teams have the expertise to deliver telecom services in remote and underserved areas, as was proved during a recent deployment of a GSM network in the DRC.

According to the company, transportation in underserved areas is the first challenge, and you have to start by finding an experienced person that knows the location.

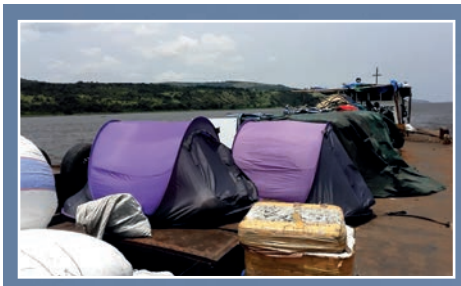
Furthermore, travelling conditions can be harsh and risky, especially on sandy, muddy or rocky roads, or by boat in bad weather conditions (boat is often the only way of getting to a remote village).

"Common sense and field expertise is the recipe to overcome the various stumbling blocks along the way," said RascomStar. "The key is to plan, anticipate and prepare all the needed material, like satellite phones, spare parts such as tyres and batteries, and provisions for fuel, oil and technicians. And of course, there is no electricity or garage along the way."

The company added that working in rural areas requires teams to be very flexible and ready to adapt to local conditions. "It can be a nightmare but also thrilling. Simple things like food can be a challenge: be ready to eat just once a day, due to the fact that there is no shop, no grocery. So you must be ready to experiment with all kinds of food, living places, forms of entertainment and language of communication.

"In cross-cultural perspectives, be prepared to meet with people with communication and language issues, lack of respect, lack of education and abnormal behaviour, and finally be ready to adapt to the system of life."

When travelling to install networks in remote parts of countries such as the DRC, you need to go prepared and pack a lot of supplies.



RascomStar's deployment team had to endure some difficult conditions, such as sleeping under tents or on a boat after heavy rain soaked the tents and mattresses. Long-drop toilets and bucket showers using dirty river water from the Congo added to the experience.

Engineers install the omni antenna at the site to help achieve their ultimate goal.

During field installations, operations and maintenance, work usually starts at 7am and can run until 11pm depending on the type of activity which can become very complex in the case of troubleshooting. Again, preparation is key here.RascomStar said don't ever think a simple screwdriver or an Ethernet cable can be found locally, or that you can charge your electronic devices – you have to take your own generator (and fuel) until solar panels are mounted and operational.

Security is another major issue. You need to keep an eye on your work tools and personal belongings all the time and be wary of theft and pick-pocketing. RascomStar said that you should also watch out for double dealing, and advises team members to be "humble and very smart" when they deal with people.

"Despite all these challenges, you have to keep constantly in mind that the main goal of the mission is to activate the various satellite and GSM sites as per the original project plan and deliver according to the customer expectation," stated the company.

"Once the site is operational, the reward of witnessing the joy of the inhabitants able to talk to their cousin in Kinshasa or in the US, for example, helps you forget all the difficulties faced in the past days. Just remember that a mobile phone in these remote places suddenly has the ability to reach seven billion users worldwide."

Timecard helps Metro keep an eye on its staff

Formed in 2004, Metro Telworks primarily specialises in providing RF services and in-building solutions to OEMs, NEMs and telcos. Its South African branch covers several countries on the continent and has approximately 80 employees.

The company is said to provide a valuable service to network operators such as Vodacom and Cell C, but also undertakes large projects which it manages from end-to-end.

The bulk of Metro's work is performed by field engineers who are driven each day along specific network routes to check signal strength for 2G, 3G and LTE networks, thus allowing mobile operators to deliver seamless and reliable signals for millions of their users. Each team consists of a vehicle, driver and engineer. They are dispatched to check signal strength along requested routes, as well as in-building/campus signal stability and strength.

"Because the teams are out in the field for long periods of time, we needed to know where they were, if they used the correct route, and which hours they worked," said Tajuddin Mohammed, human resources manager at Metro Telworks, South Africa.

Other pain points for the company involved its drivers speeding, thefts of expensive equipment from the vehicles, misreported hours worked (especially overtime), and damage to vehicles and accidents.

"We needed a solution that would solve all these issues and give us management reports so we could issue reprimands for speeding and causing accidents," said Mohammed. "We needed to check on the locations where robberies were occurring and provide this information to our insurers, when the team clocked in and out, and whether they actually did work overtime.

"As the engineers use their own phones, we also needed a solution that would run on a variety of mobile device brands, including *iPhones* and *Android* devices."

The solution came in the form of *Timecard GPS* from Econz Wireless, a South Africa-based specialist in hosted enterprise mobility applications.

Metro Telworks' teams comprise two employees – a driver and an engineer. One of the features in Econz's *Timecard GPS* solution is *Team Services* which allows the engineer to clock both himself and the driver in and out using a single mobile device. This saves Metro the costs of individual subscriptions for two separate phones. Econz said *Team Services* can support up to 45 members in a team on one device.

Another feature, *Speed Trigger*, enables head office to see speeding reports, location, and if any speeding incidents led to an accident. These reports fulfil insurance requirements and mean Metro can penalise the driver involved and recoup speeding and accident costs. The feature also activates an email to the office so that managers can take immediate action by contacting the driver.

Metro Telworks' field engineers are driven along network routes to check mobile signal strength. Each team consists of a vehicle, driver and engineer.

After using the system for over a year, Mohammed said Metro was "extremely happy" with it. "*Wireless Timecard GPS* was accepted quickly and willingly by the field teams as we can provide them with immediate assistance in the case of a breakdown or accident. It has been a tremendous help in disciplining our drivers, even terminating [their employment] if necessary.

"We have saved on fuel costs due to *Speed Trigger* and *Breadcrumb* trails. Speeding fines, vehicle damage, and robberies have decreased exponentially."

He added that Econz is quick to resolve any reported issues with the system, and provides regular updates that meet Metro's needs.

One such update is the *Alert Admin* feature. This provides management with a new *Clock In/Out Exception Report*. Admin teams need to know if someone is late, actually working or absent. This also allows field management to decide whether it is necessary to send a temporary worker from nearby. Using *Admin Alert*, they can configure specific time limits for clocking in, and follow up to see if the person is sick or constantly late, before taking action.

Mohammed said: "We used to have such a problem discovering whether overtime was true and justified but now we can track this easily with our reports."

Value-added services

MTN gives its staff a voice

With around 250 million customers and 22,000 staff working at its 22 country operations across Africa and the Middle East, listening to everyone's views is a challenge for the MTN Group.

Every year, the company invites its 300-strong leadership team to its head office in Johannesburg. It says this two-day gathering helps fix strategic priorities and provides everybody with an update on how the company's vision of 'leading Africa into a bold new digital world' is progressing. However, to be successful in this ambitious aim, MTN knows it needs to engage all of its staff, not just the leaders.

As employees are working across such a broad region, extending from Nigeria and Ghana to Iran and Afghanistan, this was not a straightforward call.

"We wanted to bring the voice of the staff into the meeting," explained Dane Osborne, MTN's senior manager of culture, change and environment. "Candour is one of our hallmark behaviours and we recognised that only when we engaged everybody in the ongoing dialogue about our strategic plans would we be able to move forward and demonstrate that everyone's opinion matters."

MTN says having *Speak-Out* as a mobile link between its staff and leaders helped "bring business to life".

With an average employee age of around 35 and a policy of keeping with their digital vision, MTN decided that a mobile app would be the most appropriate way to reach out to staff. It hadn't used an engagement app before and ended up choosing *Lumi Say* from UK-based real-time audience engagement technology specialist Lumi.

According to Osborne, it was selected over other solutions because of its intuitive user interface and the fact that the platform could be customised with MTN's branding. But she pointed out that Lumi's support was the main reason for the choice.

"They were a very agile and service-orientated team. They quickly got their head around our business requirements and were able to respond to us in a very short space of time. In fact, they were able to accept and customise our content in what we felt was record time."

Osborne added that Lumi also understood MTN's information security and corporate governance requirements and was able to satisfy these "effortlessly".

MTN rebranded *Lumi Say* as *Speak-Out*. It claims this underlined the importance the company attaches to both honesty and engagement. While the company's footprint embraces many languages, it decided to stick to using English for the app as this was "more straightforward".

MTN invited all staff to use *Speak-Out* and share their views and sentiments about the company's strategic direction using polls, rankings, as well as qualitative questions which could be answered using voice clips. It said the two-day meeting was all the more lively and valuable for including everybody's views.

Lumi's event app, *Lumi Show*, was used to give leaders a chance to interact, too. They were able to pose questions to speakers and add pop-up comments throughout the conference. MTN said leaders could move around between breakouts seamlessly because of the up-to-date info and announcements received via *Lumi Show*.

The app's live voting and discussion facility ensured that they could give their opinions in the moment and when it mattered most. Logistical information, such as bus transfer schedules and travel documents, was also loaded into the app for users to refer to.

MTN said *Speak-Out* further promoted its digital vision and helped engage the leadership team before, during and after the conference The company took all the data received from the app, animated them and presented the results to the conference. "This gave the leaders an important context for considering our future direction," said Osborne. "It helped them to understand our current position and make better-informed decisions about where we want to be in the future."

But she added that it was really the voices of employees that stole the show. "It meant we really extended the reach of the meeting beyond the leaders and, by using more than one Lumi solution, we got so much more value from our investment in the event.

"When you think about it, the scope of this engagement was huge, giving thousands of employees the chance to have their say and be taken along the same journey as our leadership team."

TelOne jumps ahead with Leap

TelOne is Zimbabwe's national telecoms service provider and is wholly owned by the government. It provides a wide range of services to residential, business and government customers, including national and international telephony, internet, leased lines, satellite communications and mobile via CDMA. TelOne's next-generation network also operates as the hub for Zimbabwe's national and international commercial transactions and business communications.

The company was looking for a solution to support its billing and charging, customer management, order management and network management needs. This was required to provide customers with a single bill, summarising all the services they use from their subscription packages and offering a single point of contact for all their queries. In addition, TelOne needed to ensure accounting accuracy of its growing interconnection revenues.

Moreover, the operator wanted a reliable, accurate and flexible solution that would meet its current and future needs, while providing a seamless migration from its legacy systems to a new infrastructure environment. TelOne's ultimate goal was to leverage its broad portfolio of offerings and be able to introduce new and advanced mobile and broadband services.

FTS was awarded the project. The Tel Aviv-based BSS specialist says it was chosen for its ability to provide a "true" end-to-end and convergent solution fully adapted to TelOne's requirements. During the negotiation process, the company said that it developed strong contacts with TelOne's management and technical staff. In particular, they were impressed with the flexibility of FTS' *Leap Billing* platform, and with the idea of being able to quickly launch new pricing plans, services and promotions.

The implementation included *Leap Billing*'s customer management, interconnect and settlements, convergent billing and charging, and network management platforms. Based on the company's *DO Tree* technology, it's claimed FTS' platform enabled TelOne to develop new revenue opportunities via enhanced customer support and experience. To implement the mediation part of the solution, FTS partnered with Packetware, an India-based mediation software vendor. FTS acted as the prime contractor with Packetware filling a subcontractor role.

The project consisted of two phases, the first of which covered mediation and interconnect billing. Phase 2 encompassed convergent charging and billing (including credit control), invoicing, customer management, order management system, fault management and accounts receivable, followed by infrastructure and network management.

FTS said TelOne is now delivering new services to its customers while implementing creative billing schemes. The key benefit to the telco's customers was a single, unified bill that outlines the different services they used from across the package that they subscribe to. The invoice details all the services they have been charged for, from wireline telephony and internet services to CDMA usage. The customer management module also provides all TelOne's customers with a single point of contact for all their queries.

In addition, using *Leap Billing*'s interconnect solution enabled TelOne to turn its interconnect and settlements policies into a revenue stream, with an almost immediate ROI.

Fixed wireless access

Kukua keeps an Eseye on Africa's weather

Based in the Netherlands, Kukua aims to provide accurate weather data and forecasts to smallholder farmers, commercial farmers and other stakeholders throughout Africa. Its overall mission is to "close the continent's weather information gap" by leveraging new weather station technology and mutually beneficial partnerships.

One such partnership is with UK M2M specialist Eseye. It has enabled Kukua Weather Services to offer its customers reliable and securely connected weather stations. These are used to provide a much needed improvement in accuracy in weather predictions. The stations give Kukua the ability to create constantly updating weather maps of sub-Saharan Africa to ensure that the frustrations of uncovered areas are a thing of the past.

The Institute for Climate and Society in Mali has concluded that crop yields can

Kukua has installed 60 of its solar powered, internet-connected weather stations in Nigeria, and has 19 additional units operating across five African countries.

be increased by up to 20 per cent when smallholder farmers have access to advice based on weather conditions. But rural areas in sub-Saharan Africa have a lack of weather monitoring infrastructure due to the associated costs.

Kukua said its "thrifty" weather stations collect information on the local weather including wind speed, wind direction, solar radiation, rainfall, temperature, humidity, and much more. The design is said to use a specifically created frame that can accommodate a range of different sensors to suit the precision and price point required by the customer.

The World Meteorological Organisation-standardised sensors inside a Kukua weather station are attached to a small solar panel, which is then attached to a battery, two micro-controllers, modem, and an Eseye *AnyNet* SIM card. Using Eseye's connectivity, the collected data are sent off at regular intervals to be analysed and interpreted after which they are presented and used to inform and advise farmers using precise weather predictions. The raw data are used by scientists in yield models and other research projects helping to nourish Africa.

With the Kukua team focused on the collection and interpretation of the information, Eseye was brought in to manage the connectivity. Within a week of first contact, the *AnyNet* SIMs were inside the Kukua stations on their way to being deployed in-country.

Eseye manages the relationships with the local MNOs to ensure the *AnyNet* SIM is always within network coverage. Customers are invoiced using easily understandable zonal tariff and bundles which allows Kukua to ship products anywhere in Africa.

Building upon the universality of weather conditions, Kukua Weather Services is currently partnering with large NGOs to establish networks of weather stations across the continent. The data are used for NGO research purposes, and plans are being made to sell the data to both commercial and smallholder farmers in order for Kukua to become financially sustainable. The service will also be provided to disaster relief charities, renewable energy firms, transport and logistics companies, as well as event organisers.

One of Kukua's current partners is using the weather information to help understand the difference in yields across groundnut plantations in Tanzania. Comparing the farming techniques with the weather conditions allows the partners to find the best farming techniques for the conditions. This in time can enable accurate and useful yield improving training to help the farmers.

The main campus building of the University of the Free State in Bloemfontein.

Through its partnership with Eseye, Kukua has ensured that its weather stations have been quickly deployed in multiple nations, and all within a fixed monthly connectivity cost. Eseye added that with its ongoing support, farmers in sub-Saharan Africa can be sure the information that assists them in harvesting success is in safe hands.

State-of-the-art Wi-Fi at University of the Free State

With the proliferation of Wi-Fi connectivity in companies and organisations, many workers now expect to be able to connect their personal mobile devices to their employer's corporate network. This has given rise to the so-called 'Bring Your Own Device' (BYOD) trend.

In 2012, when the University of the Free State (UFS) saw BYOD start to gain traction, it decided to update its wireless network with the help of Aruba (now owned by Hewlett Packard Enterprise).

Aruba partner Khipu Networks handled the planning, Wi-Fi surveying and installation, with the first phase rolling out at the university's south campus, and the main campus in Bloemfontein following suit a year later. Several years down the line, UFS's QwaQwa campus has rounded out Wi-Fi deployment across the sites, while the main campus's wireless network has now been densified.

All campuses also enjoy wireless connectivity in outside, open space locations, with Wi-Fi being deployed in all residences as well. Gareth Trollip, head of technical SA at Khipu Networks, said: "There are also ongoing requests for us to come and plan for Wi-Fi in new buildings as the university continues to grow. They want to have a completely connected campus."

Currently, a total of 2,000 Aruba access points along with eight of its *Mobility Controllers* effectively serve UFS's 33,000-strong student base and 4,500 staff. The mixed environment network makes use of 802.11ac for high density areas and 802.11n for lower density areas, although there are plans to roll out 802.11ac across the entire university.

The university's assistant director Renier Sonnekus said that having Wi-Fi deployed across all parts of each of the campuses is essential for students who want to be able to connect using their tablets and phones wherever they are. "Ensuring that we have the latest technology not only in the lecture halls, but also in the residences and outside areas means they can continue learning and interacting with each other with no constraints."

As well as enabling ubiquitous connectivity for students, Aruba said it is equally important to manage their access to the wireless network effectively. Here, the vendor said its authentication server, *ClearPass Policy Manager*, helps simplify access for the thousands of users accessing the network.

"*ClearPass* is the authentication server to which all wireless connections in all locations are sent," explained Trollip. "It's in the data centre at the main campus in Bloemfontein, making it easy to manage authentication requests from the south campus or QwaQwa campus in one central place. All policies and rules are centrally managed there by the university's IT team, along with Khipu."

Sonnekus added that *ClearPass* has made it possible for the university to manage the network across all its campuses. "It has also been useful to us in dealing with students misusing the network. With the tool we were able to pick up those instances of intrusions and misuse immediately and act accordingly."

The policy management solution was also an integral part of the deployment of 'eduroam' at the university. This is the service educational institutions use to ensure their staff and students can easily connect to the wireless network at all connected universities.

"It works by broadcasting the eduroam service on campus, which staff and students can connect to," said Trollip. "If *ClearPass* identifies that they attend UFS, it dynamically provisions their access to local UFS resources.

"Alternatively, if a student or staff member is visiting a UFS campus from another university, the authentication request is sent from the UFS *ClearPass* system to eduroam's centrally managed RADIUS environment, and on to the student or staff member's home campus authentication system. This enables the user to access their home resources from a UFS campus. Our 'eduroam-in-a-box' deployment method allowed UFS to setup eduroam quickly with minimal resources."

UFS is utilising *Aruba AirWave* to fully manage its wireless and wired network. It also uses the platform for remote deployments and managing bandwidth. As a network monitoring and troubleshooting tool, Aruba said *AirWave* provides UFS with helpful visuals when any APs or switches go down. It said that all Wi-Fi controllers are also managed at one central point on the main campus which simplifies the task and saves time and cost for the IT team. Furthermore, UFS uses *AirWave* to manage and prioritise VoIP for the students across the campus.

Another key feature is the platform's ability to detect and identify each device and therefore enhance physical security. "UFS can locate and track devices which have been reported 'lost' within the campus, which is hugely beneficial. This alone has saved UFS a lot of money by reducing device thefts on campus," said Aruba.

Broadband

Mining firm digs and finds its needs more than just fibre

Fast and reliable broadband connectivity is transforming mining operations across Africa.

Liquid Telecom is working alongside mining customers such as Metorex to provision networks that can support future high-bandwidth applications, while allowing employees to communicate, collaborate and make decisions in real-time far more easily and effectively.

Metorex's Kinsenda mine in the DRC has one of the world's highest grade copper deposits. It has declared mineral resources of 20.7 million tonnes at a grade of 5.6 per cent copper.

Metorex is an established mid-tier mining company with two sites in the DRC and one in Zambia. Its African HQ is in Johannesburg while its corporate base is in Hong Kong. The company is a subsidiary of the Jinchuan Group which was ranked 32nd in China's top 100 multinational enterprises in 2015.

Four years ago, Metorex completely re-organised its ICT infrastructure and functions to create a central management platform for employees to work more productively. However, although the platform was well received internally, it soon became clear that the company needed to review its connectivity.

Despite spending USD40,000 per month on C-band VSAT connectivity into its African operations, Metorex was only receiving 4Mbps shared between all of its sites. All traffic had to transit via South Africa, resulting in latency of more than 600ms. To make matters worse, expensive truck rolls were required to fix issues in the field. This situation could not support Metorex's new way of working, particularly as it was now using VoIP and video conferencing, as well as transferring large files whilst doing live transactions on ERP systems.

Hong Kong-based Metorex claims to be "uniquely positioned" in the southern African base metals mining industry as a pure copper and cobalt investment.

Fast and reliable links were essential between its three mines, and offices in South Africa and Hong Kong. Metorex knew it needed connectivity with guaranteed SLAs and QoS. Not only did it want to centralise around one full-service supplier responsible for connectivity across Africa and into Hong Kong, it wanted one that would be a long-term partner.

Metorex is technology-agnostic and understands that sometimes it isn't economical to connect a site with fibre – in fact, because the airwaves are uncluttered in mining areas, the optimum network can be provided through a combination of fibre and wireless.

Following detailed research into its options and after recommendations from industry experts, Metorex chose Liquid Telecom to provide a single solution for all its connectivity requirements. As part of the ongoing build of its pan-African fibre network, Liquid included the mining areas of Southern Africa into its plans from the beginning.

MPLS is of particular importance for mining companies as it provides flexibility for those who run legacy systems. Liquid said it is the only MPLS provider on the continent, and therefore the only company able to provide such technology within a mine.

Liquid restructured Metorex's network topology and calculated that the most cost-effective way of connecting each site was by using an MPLS EP-LAN solution.

In Zambia, new fibre was laid to the Chibuluma mine from Liquid's existing fibre network, and it was connected within just one week of the operator being appointed.

Next came the two mines in the DRC: Ruashi was connected using a 5.8GHz point-to-point wireless link to cover the 4km from the existing Liquid POP at Lubumbashi airport (which connects to Liquid's pan-African fibre network); Kinsenda was then hooked-up with a 5.8GHz link covering the 20km from an existing POP at Kasumbalesa.

Metorex's HQ in Rosebank, Johannesburg was also connected by Liquid's fibre, while Hong Kong was linked using the Liquid network via Fujairah in the UAE which, according to the operator, provides "very aggressive" latencies from Africa to the Far East.

Metorex now has a fully integrated network with no third-party dependencies. All five connections receive 10Mbps, enabling 'Big Data' transfer. The network is said to offer almost 100 per cent availability which means Metorex no longer needs a backup VSAT service. Liquid said that a multitude of new services have been made possible, including the creation of a new VLAN and global video conferencing over private IP and the internet.

As a result, Metorex has been able to standardise and develop its ERP system to improve the user experience, drive costs down and introduce standard reports and financial processes. It has also achieved cost savings by centralising various tools for planning, geology, engineering, surveying, maintenance, etc. In short, the firm now has a network that can support future high-bandwidth applications which are being developed for the mining industry.

Satellite

Connecting readers and listeners

As a satellite operator, UAE-based Yahsat says it is seeing at first-hand the benefits that technology is bringing to communities and individuals across Africa, enhancing business, healthcare and educational opportunities.

"African economies are set to continue growing, allowing more people to grow their disposable income and consequently, a better standard of living," said the operator. "The correlation between investment in broadband connectivity and the growth in economic activity has been well established, with research suggesting that for every 10 per cent increase in broadband connectivity, the GDP of developing nations rises by 1.38 per cent."

The Eastern Cape in South Africa covers 65,000 square miles. Outside of the major cities, the province is diverse in terms of landscape, and home to many rural communities. These remote communities rely on local resources to stay informed and educated with community libraries playing a key role. But traditionally, these libraries have been underserved in terms of connectivity, meaning library-to-library communications and public internet access has been unreliable.

The National Library of South Africa is a custodian and provider of the nation's key knowledge resource. Mandated to ensure that knowledge is not lost to posterity and that information is available to all, South Africa's Department of Arts and Culture, which oversees the library, decided to undertake an ambitious project to improve access to its services in 2010.

Given South Africa is the 25th largest country in the world and home to nine provinces (of which the Eastern Cape is the second largest), connecting the libraries and rural communities, was a significant challenge due to the lack of nationwide infrastructure.

In an effort to support the National Library project and to help drive knowledge across South Africa, Johannesburg-based independent telco Vox Telecom and Yahsat joined forces to provide satellite broadband internet services to all public libraries in the Eastern Cape. *YahClick* – Yahsat's satellite-delivered broadband service – was chosen due to its ease of installation, with no terrestrial restrictions. Yahsat claimed the service has proved to be the ideal solution to connect libraries with each other and with the outside world in a more affordable and reliable way.

Today, the company said its partnership with the National Library project has given communities easier access to information and knowledge, enhancing the learning experience even in the most remote locations by connecting 207 remote libraries. In addition, the company said it has given individuals a renewed interest in reading with libraries seeing an increase in footfall.

As well as readers, Yahsat has also been helping to connect listeners. There are said to be an estimated 15.4 million radio sets in South Africa, with community radio attracting almost half of that listenership per week. Post-apartheid deregulated broadcasting led to an upsurge of community radio stations across the country.

"South Africa now has more than 200 community stations, broadcast in a number of languages with content as diverse as the country itself," said Yahsat. "Their scope and reach varies enormously from Eurocentric Cape Town, to traditional farmers in the Free State Province."

Staying connected, especially over such a diverse geography, is essential. And with radio, often the prime means of communication – particularly in rural areas – radio stations need access to events as they happen.

The Brand Connection, a South African media company, provides outside broadcast (OB) facilities to government and NGOs, allowing events to be broadcast as they happen. The company allows community radio stations to cover live events from election rallies to commercial brand activations. Without a satellite link, many of these broadcasts would not be possible.

Typically, it is difficult to broadcast live from hard-to-reach places due to a lack of communications infrastructure. Terrestrial telecommunications lines take several

Johannesburg-based independent telco Vox Telecom helped connect South Africa's libraries and community radios.

The Brand Connection uses *YahClick* to give radio stations what it claims is an "almost instant" outside broadcasting solution.

PHOTOS: AL YAH SATELLITE COMMUNICATION COMPANY (YAHSAT)

Above left: SpeedCast trained members of Save The Children's staff as VSAT installers at its teleport in Germany. Above right: Save The Children's new satellite service provides connectivity to a network of C-band VSAT systems across multiple sites in Africa.

days to set up, and are therefore often too prohibitive for breaking news stories.

Vox Telecom was again called upon for its assistance. Working with The Brand Connection, it deployed *YahClick* to provide what's described as an "almost instant" OB solution. Yahsat said the OB team can be deployed anywhere in the country and, after submitting GPS information, broadcast live.

As a result, it's claimed *YahClick*'s uninterrupted satellite service has ensured that community radio stations in South Africa are able to keep their more than 8.6 million listeners up-to-speed with the latest news as it happens.

SpeedCast connects multiple sites for NGO with no downtime

Save The Children is an international NGO with its central office in the UK. In 2015, it required a connectivity network for 35 sites across Africa. The rollout of the new service was particularly complex, as it involved the migration from an existing service provider to SpeedCast. This process required work across multiple countries and had to be completed in a highly efficient manner, due to a tight deadline to complete the rollout before the previous provider switched off the existing service.

SpeedCast said its network design team worked directly with the customer to optimise the design to meet Save The Children's specific requirements. The new service was set up for the customer as a virtual network operator. SpeedCast said the VNO allows Save The Children to allocate pooled bandwidth efficiently and allows the flexibility to make changes quickly.

For example, QoS was used to prioritise certain types of traffic over the network. To ensure that staff can communicate effectively, Save The Children prioritised Microsoft's *Skype* and *Lync* services. Augmenting this, SpeedCast said its portal and associated *Android* application proved to be "extremely useful and informative tools which allow Save The Children to monitor the VNO performance at anytime from anywhere.

The company trained members of the NGO's staff as VSAT installers at its teleport in Germany. This was said to be a great investment as one of the team members was able to quickly apply the training and completed the installation of a number of VSAT units in Sierra Leone during the Ebola crisis.

"I spent two months connected to the SpeedCast service, and the connection quality was better than some places in Europe," said Mark Hawkins, global field technology manager at Save The Children. "I was able to participate in conference calls with other parts of the world and some people were surprised that I was communicating over a VSAT link.

SpeedCast also supported Save The Children in Somalia. Here, the charity's staff re-pointed all of the VSAT systems to the new network. This flexible and collaborative approach was particularly helpful to Save The Children as Somalia can be a challenging place to find satellite engineers.

During the migration process, SpeedCast said its technical support team also proved to be a critical factor, helping to rapidly mitigate problems that Save The Children encountered. During such major deployments, SpeedCast said its support staff have well-defined processes in place to prioritise requests from the Emergency Response Team, as efficient communications are essential to successful rollouts.

Save The Children engineers said that they appreciated the direct access to SpeedCast technician via SMS as well as voice. SpeedCast said they also reported that it was far more efficient than the usual 'call centre' queues they had encountered with other VSAT service providers.

The new satellite service provides connectivity to a network of 35 C-band VSAT systems across 35 sites in Africa. SpeedCast says all sites were successfully deployed ahead of the deadline, and as a result there was no disruption of service for the customer.

With the new network, Save The Children expects to be able to significantly reduce its operating costs. It's claimed this will allow for a full-cost recovery as SpeedCast reckons its service delivers "greater performance at a lower price point".

Furthermore, all this is said to have enabled Save The Children to provide an "excellent service" to its sites which could not be matched by the old system, where each site had individual contracts with a range of different suppliers. "Following the success of migrating our core C-band network, we have now worked with SpeedCast to expand the network to 51 sites," said Hawkins. "By replacing Ku-band equipment with C-band systems, we have been able to provide our field sites with a better service for a lower monthly cost."

SENTECH upgrades with Newtec

According to satellite equipment innovator Newtec, broadcasters and service providers today face numerous challenges. These include more complex workflows, introduction of new services, increased user expectations for always-on connectivity, and pressure on efficiency in both the space and ground segments.

With these challenges in mind, South African state-owned broadcasting signal distributor SENTECH was looking to deploy a scalable solution that enabled it to move with the rapidly evolving broadcast industry.

SENTECH opted to upgrade its satellite ground segment at 800 of its sites across South Africa. For this substantial project, it engaged African Union Communications (AUCom) as its primary contractor, and its long-term certified partner supplier Newtec to provide the necessary platforms and modems.

Working closely with the end-customer to establish its requirements, Newtec provided its *Dialog* multiservice platform, including the *MDM2500* IP satellite modem. It's claimed this provided SENTECH with the efficient modulation it needed within the platform.

Newtec said the primary driver for developing *Dialog* is reducing a client's opex and capex, as well as increasing operational flexibility. It describes *Dialog* as a "single multi-service platform designed to support and automate mixed occasional use live and file broadcast workflows, in combination with always-on data and voice services".

Newtec reckons the flexibility of its platform enabled SENTECH to tailor it for the services it required while still receiving guaranteed optimal modulation, bandwidth allocation and service availability, along with reliable automation of link setups and flexible workflow support.

It also provided the company with the ability to utilise Newtec's *Mx-DMA* return link technology. This is claimed to deliver the efficiency of SCPC with the dynamic bandwidth allocation of MF-TDMA in a cost-effective manner.

By deploying *Dialog* across its sites, SENTECH is said to have expanded its capabilities for DTT signal monitoring, IP multicasting, radio backhaul, point of sale support and government disaster recovery connectivity. Using standard Ku-band capacity, it has been able to expand its current service offering while retaining the ability to scale up its operations within the current *Dialog* setup.

Creating Village Islands in Nigeria

Citing a report published by Twinpine[1] last August, Gilat Satcom said less than half of Nigeria's population of almost 185 million people have active phone numbers. More recent figures from Nigeria's Universal Service Provision Fund (USPF) state that around 36.8 million people in the country live in areas that are more than 5km from a BTS and are therefore considered underserved or unserved.

According to Gilat, these extraordinary statistics illustrate why connecting the unconnected is still a huge challenge in Nigeria. But in the country's north east, around 50,000 people now have voice and data services, thanks to what it said is pioneering work carried out by local telecom specialist Total IT Solutions. It is rolling out networks on behalf of the USPF, which was established to facilitate the extension of ICT and network services to rural, unserved and underserved areas of the country.

Gilat's system was specifically developed to provide internet, VoIP and Video over IP connectivity over a private satellite network with low prices for connectivity for individual villagers.

Total IT Solution has chosen Gilat Satcom as its equipment supplier for the networks. Gilat Satcom says its *Village Island* portfolio provides all the components required to build "extremely efficient and cost-effective self-contained networks". It was specifically developed to provide internet, VoIP and Video over IP connectivity over a private satellite network with low prices for connectivity for individual villagers.

It's claimed the Village Island networks can easily be scaled to service hundreds of users with a variety of disposable incomes. The system has been deployed in ten villages so far with the service available to around 50,000 people.

Gilat Satcom has installed VSATs in each village with connectivity provided over its satellite network. The VSATs, Wi-Fi routers and other equipment are powered by solar and housed in a purpose-built communications block (the 'Community Hub') in each village with data available up to 100m away.

The service is pre-paid with people able to buy vouchers in the village. All funds raised are ploughed back to cover opex.

Muhammad Yahya Sanda, CEO of Total IT Solutions, said: "These networks have already exceeded the expectations of the villagers. We all have friends and family in rural areas and now they are connected to us and to education, medical services, commerce and so much more.

Following the success of these networks, Total IT Solutions plans to rollout hundreds more across rural Nigeria.

Critical communications

Huawei & Kenya Police

In the remote areas of Kenya, the wireless emergency communication network used by the national Kenyan Police used an old analogue trunking system and out-of-date equipment.

As well as high O&M costs, Huawei said the trunking system was vulnerable to external signal interference so that officers on patrol and manning the command centre were unable to hear each other clearly.

Although TETRA has been used in cities such as Nairobi, Huawei said the system only supports voice and not video and broadband data services.

To make citizens and their work environment safer, and to attract more foreign investments, the Kenya Police realised it needed an emergency communications network with better features and advanced technologies to be able to employ video dispatching, video surveillance, and high-speed data backhaul services.

What's more, in its plan for 2030, the country's government said the information industry is one of three key areas that needs to be focused on.

The emergency communications network used by the Kenya Police is constructed and maintained by Safaricom. It worked with Huawei to deploy an eLTE emergency communications network in Nairobi, suburban areas up to 10km distant from the city, and in the urban areas of Mombasa, the country's second-largest city.

When emergencies occur, on-duty personnel at the Nairobi Police Station can send on-site, real-time high-definition videos to a large screen at the command centre by pressing the shortcut buttons on their trunking handsets. The command centre can then deliver these videos to police cars equipped with voice and video stations. As a result, all on-duty personnel at headquarters, the command centre, and in police cars can conduct a visible, coordinated, three-pronged operation.

Huawei said it also provided a unified solution that integrates intelligent video surveillance, IP contact centres, telepresence video conferencing, and a geographic information system. The solution is used on the eLTE emergency network to deliver voice, video, and data services.

This is said to have improved the Kenya Police's ability to cooperate with medical departments, municipal administrations, and other departments, as well as enhance the efficiency of its emergency response.

In 2016, Safaricom planned to continue to work with Huawei to speed the construction of Kenya's eLTE emergency communications network and extend it to other major cities and roads in the country.

[1] *http://techcabal.com/2016/08/04/mobile-is-eating-nigeria-according-to-the-2016-twinpine-mobile-trends-report/.*