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chapter 3

Fixed wireless access

Towards a vision of the future of fixed wireless



Shrikant Shenwai,
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In our 2015 annual report published last October (entitled *2016 to 5G*) we stated that the transition from best effort to carrier-grade Wi-Fi networks was very visibly under way, and that the ecosystem is starting to plan for the next five years.

In the near term, wider-scale, carrier-grade deployments are enabling new business models such as

smart cities and enterprise services. Looking ahead, in our *Towards 2020 Vision* statement we consider how Wi-Fi can evolve around four critical business opportunities: smart cities, 'Big Data' analytics, the IoT and converged services. All that will be enabled by the availability of a truly carrier-grade platform.

Most of the elements of a carrier platform – security, QoS, high availability, strong coverage and data rates, integration with operator OSS/BSS platforms and their other networks – are now in place. That makes Wi-Fi a strong platform in a wider range of business scenarios, and that in turn is driving investment, both by traditional players like pure-play and mobile operators, and by new service providers from the OTT or IoT communities.

The pace of change is accelerating across the public Wi-Fi ecosystem. Last year's report detailed some quite significant shifts, but the contrasts which can be seen this year are even more dramatic. These are driven by several overall trends:

- ❖ The increasing shift from best effort Wi-Fi to full carrier-grade Wi-Fi, enabling many new business models.
- ❖ The use of Wi-Fi as a strategic platform

by an increasing variety of service providers including pure-plays, aggregators, mobile operators, multiple-system operators (MSO), and vertical market operators.

- ❖ Wider applicability of Wi-Fi technologies as standards evolve and the needs of service providers change, e.g. the move of Wi-Fi into the IoT.
- ❖ Development of new technologies to support those carrier-grade and integrated models, from extensions to the 802.11 family, to evolutions of next-generation hotspot (NGH) and Passpoint.
- ❖ The start of the process of defining 5G standards and the role of Wi-Fi and other unlicensed technologies in the next generation multi-technology wireless platform.

These big shifts mean that the three themes identified in the *Towards 2020 Vision* statement are equally applicable to all Wi-Fi stakeholders. Technology providers, service providers, regulators and industry alliances need to:

Accelerate – develop their technologies, business models and rules to keep pace with the changing ways that consumers and enterprises use wireless networks, and so encourage the deployment of carrier-grade Wi-Fi networks.

Diversify – apply the expanding Wi-Fi platform to a wider range of target applications and businesses, with significant opportunities in the IoT, Big Data, converged services, smart cities and many more.

Increase – invest as much resource as possible in developing, testing and deploying systems and services, and in pushing the technology to the limits, even towards 5G.

That will present challenges as well as opportunities for the WBA and its members. In particular, at a time of significant change, there is a difficult balance to strike between continuity – building on what has already been achieved and consolidating successful platforms and services – and looking ahead to new horizons like the IoT and 5G.

Growing confidence

Carrier-grade hotspots will outnumber best effort in the installed base by the end of 2017, when 57 per cent will support the more advanced capabilities, and will account for 90 per cent by 2020. And two-thirds of respondents to our annual ecosystem survey said that they felt more confident about deploying carrier-grade Wi-Fi than they had 12 months ago – a figure which is up from 56 per cent in the 2014 study.

The dominant business driver for this investment is improving the overall customer experience, which in turn translates into new revenue streams like TV everywhere or enterprise services. Improving customer experience in order to reduce churn and boost ARPU was selected by 28 per cent of the respondents as the primary driver, followed by seamless access across different Wi-Fi/Wi-Fi or Wi-Fi/cellular connections.

In terms of specific monetisation options, those which will be deployed most commonly between now and 2020 are location-based services (69 per cent), roaming (68 per cent) and Wi-Fi analytics (66 per cent). Compared to last year's study, there is far less emphasis on Wi-Fi offload, and more on 'Wi-Fi First', Wi-Fi Calling and TV/video.

Looking further ahead to the elements outlined in *Towards 2020 Vision*, 80 per cent of respondents have deployments or plans between now and 2020 in the area of IoT/M2M, and more than half already plan for converged services (56 per cent) or smart cities (53 per cent).

Such findings indicate how rapidly the Wi-Fi services landscape is changing, driven by the new business imperatives such as multiplay and IoT, and enabled by Carrier Wi-Fi and the advances it brings in quality of experience, availability and integration.

White spaces

Having had what was claimed to be the world's biggest TV white spaces (TVWS) project in 2014 (in Namibia), Africa saw further developments in the area in 2015.

In January, Spectra Wireless and Microsoft launched what was claimed to be the region's first commercial service pilot network utilising TVWS. *djangoEd* was initially made available at the Koforidua Polytechnic in Ghana's Eastern region, and covered the campus and surrounding student hostels.

Spectra used 6Harmonics' *GWS* TVWS radios to connect the buildings, and a total of 17 links were deployed to support the polytechnic's sites. The operator also used Meraki's cloud-based Wi-Fi APs for the client access.

"We have over 5,800 unique client devices registered on our network, out of a student population in Koforidua of 8,500, so the interest level already has been high," said Spectra Wireless country leader Sam Darko.

As part of the *djangoEd* service students can now purchase high-speed internet bundles from GHD2 (USD0.61) per day, and use apps such as Microsoft's *Virtual Academy* and *Office 365*. They can also apply for zero-interest loans in partnership with UT Bank to purchase selected internet-enabled devices from Dell, HP, Lenovo and Microsoft.

April saw the Botswana Innovation Hub (BIH) launching a pilot telemedicine project using TVWS. *Project Kgolagano* provided internet connectivity and services to hospitals and clinics, enabling access to specialised medicine in Gaborone and other locations around the world. BIH worked in collaboration with a number of organisations on the deployment, including the Botswana-UPenn Partnership (BUP) between the Government of Botswana, the University of Botswana, and the University of Pennsylvania.



Using Spectra Wireless' *djangoEd* service, university students can apply for zero-interest financing to buy internet-enabled devices.

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

Project Kgolagano, which means 'connection' in Tswana, had a specific focus on providing access to specialised maternal medicine in order to improve the livelihoods of women located in small towns and rural areas. Telemedicine experts and doctors providing medical advice for referred patients were provided by BUP. The project initially ran in three locations: Francistown, Maunwas and Lobatse where it was officially launched in March at the Tsopeng clinic.

Wi-Fi free for all

Liquid Telecom Kenya partnered with the Nakuru County Government to launch an outdoor Wi-Fi network which the public can access for free. The company designed and launched the network which covers a 10km radius from the central business district. It was initially connected to a

200Mbps pool but can be upgradable to 1Gbps depending on demand. Fifty-one nodes were installed around strategic points in the town's busiest areas.

The first phase of the project covered Kenyatta Street, Marikiti Market, the central bus terminal, Afraha Stadium, academic institutions, the county headquarters and the Westside Mall. The second phase moved on to cover Naivasha and Gilgil towns, more streets using poles and other public infrastructure, as well as Egerton University in Njoro.

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

By the end of phase one, Liquid Telecom Kenya had invested USD400,000 in the Nakuru project. Figures clarifying how much was spent in phase two and also during network optimisation exercises during 2015 are currently still unavailable.

More free Wi-Fi was made available in the South African city of Tshwane in June 2015. A free "basic service" Wi-Fi was offered to everyone within walking distance of a free hotspot although maximum coverage of the city isn't promised until the end of 2016.

To that end, part of *Project Isizwe* will see an additional 1,848 free Wi-Fi zones rolling out across the city to add to the 575 sites that are currently active.

In his State of the Capital Address in May, Tshwane mayor Kgosiso Ramokgopa said: "By the end of 2016, every citizen of Tshwane is within walking distance of free Wi-Fi. The vision is to eventually provide free Wi-Fi in every street and household in the city." Ramokgopa said the new sites will be deployed in

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Pan-African operator Gondwana International Networks – better known as iWayAfrica – will upgrade its 4G network from fixed WiMAX to TD-LTE. It will use Telrad's *Dual Mode* solutions in an effort to improve connectivity for its business subscribers in Nairobi before rolling out across its other sub-Saharan networks. The solutions include the *BreezeCOMPACT 1000* base stations combined with dual mode CPEs. iWay will also use the vendor's software defined radio system for migration from WiMAX to LTE.

Integrated access services provider Q-KON has been selected by agricultural machinery

manufacturer John Deere to provide VSAT connectivity in Ghana. Q-KON has agreed to provide its C-band *Satellite Access* service for voice, internet connectivity and VPN to the John Deere branch in Ghana. Q-KON claims it can provide its new client with the "perfect solution" between the high-capacity advantages of fibre access services and the "exceptional" reliability offered by satellite access services.

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

markets. The deal also includes an initial order for *Cytec*, Cyan's smart metering hardware and software. A hundred units will be used as part of a proof of concept project for an unnamed "leading" provider of energy management systems in South Africa. In addition, XLink will provide field-based system integration and technical support for the deployment of Cyan's technology across South Africa.

Safaricom launches *BigBox*, a DVB-2 set top box that will enable subscribers to leverage the operator's 3G and growing 4G data network to access content. It will offer several TV channels in high-definition format, as well as allow users to watch content on demand

communities including Bronkhorstspuit, Hammanskraal, Soshanguve, Centurion and the greater Tshwane area.

Project Isizwe co-founder and CIO James Devine added: "In an urban environment, there will be a Wi-Fi hotspot within one kilometre of every single person in the city. In the rural context, this would mean placing a free internet zone within five kilometres of every person. The City of Tshwane is now taking the stance that free Wi-Fi is a basic service."

The free Wi-Fi project was launched in November 2013, and by May 2015 it was claimed it had more than 570,000 unique users on the network. Since then, Isizwe has also deployed networks in Thohoyandeu, Robertson, Atlantis and Lusikisiki.

In Tshwane, the project has enabled a number of value-added services. These include: free Wi-Fi on board local buses; the *WiFi TV* video on-demand service, a community initiative produced by young citizen journalists; and free on-net phone calls that are integrated with municipal call centres. The latter enables residents to report, for example, broken traffic lights whenever they are in a free Wi-Fi zone.

Upgrading to carrier-class

July saw Inwi begin to carry out a major upgrade to *Wifi7dak*, its public Wi-Fi service in Morocco. The operator was planning to increase bandwidth, support network expansion, and add new payment functionalities to the platform.

Wifi7dak was originally launched in July 2013 and made Inwi the country's first cellco to deploy outdoor Wi-Fi technology. The company wanted the upgrade to mean it would be able to offer a "true carrier-class Wi-Fi network", using Aptilo's *Service Management Platform (SMP)*.

The vendor describes *SMP* as providing highly scalable Wi-Fi services to increase Inwi's bandwidth capacity and support the growth of its Wi-Fi network. Aptilo said it will also allow the operator to easily integrate trusted 3GPP Wi-Fi access with SIM authentication, and backhauling to the mobile core via GTP tunnels as part of the next phase of deployment.

Wifi7dak is available to pre- and post-paid subscribers who can purchase the service through vouchers and credit cards. Roaming customers can also use the network, thus creating opportunities for Inwi to acquire new users and expand its services.

Mobile users can log on to the service using an app developed by France-based mobile software specialist Smartcom. This is available from Inwi's online marketplace and offers the same functionality as a branded web portal. It also provides the operator with valuable analytics and more granular control over its Wi-Fi service.

Another upgrading project saw Elitecore Technologies' service management platform being used to support Wi-Fi networks across 10 countries in Africa.

According to the India-based vendor, its platform would enable the unnamed telcos to extend their data services via a network of Wi-Fi hotspots that integrate with existing 3G mobile infrastructure. It is being used by one "large telecom group" in Burkina Faso, Congo, DRC, Gabon, Ghana, Niger, Nigeria, Tanzania and Zambia, as well as another operator in Morocco.

Akshat Joshi, Elitecore's VP of Wi-Fi product management, said: "Elitecore's pre-integrated and modular platform seamlessly integrates with the operator's existing IT and network infrastructure resulting in a quick time to market, faster rollout of services, and hence better capex savings."



Inwi became Morocco's first mobile operator to deploy outdoor Wi-Fi technology when it launched *Wifi7dak* in 2013.

The Wi-Fi network enabled the launch of bundled 3G and Wi-Fi plans, allowing all 3G subscribers to access higher throughput via Wi-Fi using their existing 3G balances. Those without smartphones could also access Wi-Fi via OTP-based authentication.

Wireless powering learning

In October two South African schools were given wireless connectivity services for 18 months thanks to network integrator Broadlink.

While the Mpheti Mahlatsi Secondary School in Orange Farm and Southview High School in Lenasia had access to computers and some tablets, a lack of sufficient funding remained a stumbling block in providing a stable internet connection in order to make use of online education programmes. The schools now have an uncapped 5Mbps wireless DSL service worth around ZAR198,000 (USD14,878) as part of a joint partnership with 3P Learning, an Australia-based international organisation that facilitates online learning platforms specialising in maths and literacy.

Broadlink also donated ZAR100,000 towards the license fees for *Mathletics*, 3P Learning's maths content programme. Nicole van Niekerk, Broadlink's marketing

via online video services such as *YouTube*. Safaricom said the device can also serve as a Wi-Fi hotspot for up to ten users.

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YooMee Africa has launched an unlimited internet service in Côte d'Ivoire. *YooMee Night* is available from 11pm until early morning, and the operator says its aim is to enable users with limited financial means to enjoy all types of downloading and surfing without limitation. According to YooMee Africa, Abidjan is home to some 200,000 university students and half of the city's population is under 20 years old. It believes *YooMee Night* will allow them to use e-learning and regular search functions to complete their

curricula as well as to enjoy entertainment and online gaming. The company said its unlimited offer costs less than USD2 per night or less than USD9 for a whole week.

Hughes Network Systems is expanding the MPLS services it provides to the African Development Bank (AfDB). AfDB has used Hughes' managed services since 2008, including MPLS circuits connecting four AfDB sites to its group headquarters in Abidjan via a teleport in Germany. As part of this contract, Hughes will now further expand MPLS connectivity to an additional seven sites including regional resource centres and key field offices. The network will be used for

major applications such as SAP, VoIP, video-conferencing and high-speed internet access.

Empresa Nacional de Telecomunicações de Moçambique (ENTM) will deliver broadband connectivity to enterprises and provide cellular backhaul to support residents in remote areas of Mozambique with the help of Intelsat. Under a multi-year deal, ENTM will use C-band capacity on *Intelsat 902* to provide dual band connectivity for local mobile operators as well as for its own transport network. According to Intelsat, for countries susceptible to heavy rainfall and flooding, C-band spectrum is particularly useful given its known performance and durability in adverse weather conditions.

head, says: "Without the internet it was difficult to run online education programmes such as these, which are meant to help bridge the gap between the requirements for more connected and paperless education and the materials that can make that a reality."

Broadlink added that it fast-tracked the installations at both schools in less than a month so that 3P Learning could begin orientating teachers on the platform and pupils were able to start using it as soon as possible. The organisation's spokesperson Penny Andrew said Broadlink's investment will help promote quality education and better prepare pupils for life after school.

Another school which gained high-speed internet services was the Federal Science and Technical College, Yaba, in Nigeria thanks to Vodacom Business.

The college is well-known for producing some of the country's best students in the science and technical fields at secondary education level. To help improve the results of the school even further, Vodacom Business Nigeria delivered Wi-Fi for students and teachers in classrooms, laboratories, workshops and staff offices. The company also sponsored a 220KVA-powered generator to help keep Yaba connected during power outages.

Vodacom Business Nigeria carried out the deployment as part of its *Power to You Project*. This supports public and private schools in the country by ensuring that students and teachers have access to ICT and new telecoms technologies. "Internet penetration in Nigeria is still low, especially in public schools," said Vodacom Business Nigeria MD Guy Clarke. "With the *Power to You Project*, we aim to bridge the digital divide that exists in communities and schools without access to ICT."

Towards the end of the year a wide-scale project saw Balton CP deploying a high-speed Wi-Fi solution from Alvarion in



Teachers are shown 3P Learning's Mathletics online learning platform at the Southview High School.

more than 15 higher learning institutions throughout Rwanda.

The project, funded through the Rwanda Board of Development, meant that tens of thousands of students and teachers gained ubiquitous access to high-speed internet and intranet services via any connected device.

The network featured Alvarion's latest version of its complete Wi-Fi package, and is mesh-enabled for what the vendor claims is "superior" coverage, both indoors and outdoor. It said the network provides secure connectivity throughout each institution's campus, and in some cases across multiple sites.

Safe and secure

Wireless access networks can offer multiple ways to improve the welfare of citizens across Africa.

In Cape Town, for instance, some of the busiest roads are now secured with an automated license plate recognition system installed by LPR Solutions. At its heart is a network of 42 *DS-2CD4012F-A Smart IPC* day/night box cameras from China-based Hikvision.

The LPR team also installed wireless links as well as cabling to feed the video streams from the cameras to a dedicated central control room located within Sea Point. Each camera supports 802.11b/g/n Wi-Fi, and has a range of 50 metres depending on the environment, according to Hikvision.

The video streams are recorded on a dedicated server via *iVMS* monitoring software and fed from there to LPR's *itrack* license plate recognition software.

"With an average of over 300,000 vehicle movements per hour being expected for the network, the sheer intensity of traffic movement represented a considerable technical hurdle for the system designers," said LPR Solutions' Chris Hobbs. "The main challenges we faced on this project were the changes in lighting conditions as we passed from day to the dark of night, the speed of the passing traffic, and ensuring the utmost in reliability."

Another example comes courtesy of the 'e-welfare' services being delivered in Mali by Globecomm and Gannexion, providing communications and morale support for personnel at remote sites. Each site features a satellite dish, Wi-Fi and GSM antennas for local delivery of radio, television, voice and data services. They are also equipped with video-conferencing facilities to allow users to interact with family and friends.

The e-welfare services are provided via satellite using Globecomm's UK and Netherlands teleports, and Gannexion's customised wireless communications solutions. Working together, the two partners are providing network services, round-the-clock monitoring, and onsite staff at each camp to support operations and provide maintenance.

The Mali installation expands on a network of facilities served by the two companies in Afghanistan, Turkey and other EMEA nations. "Together with Globecomm, we plan to continue the provisioning of innovative and custom-made services especially for governmental organisations where security and reliability is imperative," said Gannexion director Joost de Jong.

The Foundation for African Business and Consumer Services (FABCOS), and its new business incubator programme *Microtelco e-incubator*, will use satellite capacity from Avanti to deliver broadband connectivity to enterprises in South Africa. Supported by funding from the country's Department of Trade and Industry, the partners will provide high-speed broadband using Ka-band capacity from Avanti's *HYLAS 2* satellite to more than 1,000 SMEs. Avanti said the programme will be deployed extensively to businesses setting up in some of the remotest parts of South Africa, reaching a number of key sectors including retail, finance and agriculture.



Edgar Figueroa,
CEO,
Wi-Fi Alliance

The year ahead: With an installed base of more than 6.8bn devices, Wi-Fi has become one of the most prolific technologies around the world. At the start of 2016, we announced that Wi-Fi shipments had reached 12bn units, and are expected to surpass 15bn by year end.

Our 2016 technology roadmap includes programmes that will increase Wi-Fi's performance and network capacity, and will provide unique capabilities to meet diverse connectivity demands across a variety of applications and markets.

For instance, by the end of 2019 there will be more than 10bn devices capable of connecting to a home router. The second wave of Wi-Fi CERTIFIED ac features, such as wider channels and Multi-user MIMO, will deliver a better experience not only at home but also in enterprise and service provider networks.

WiGig CERTIFIED will soon complement Wi-Fi CERTIFIED ac by bringing multi-gigabit performance to in-room connectivity. The WiGig market will see significant growth in 2016, and enable streaming multiple, simultaneous UHD or 4K videos. Tri-band devices supporting 2.4GHz, 5GHz, and 60GHz will offer the best of Wi-Fi and WiGig to meet the needs of a growing number of demanding use cases.



Kamal Mokrani,
Global VP
of sales &
marketing,
InfiNet Wireless

InfiNet Wireless claims it has a unique position as one of the largest privately owned broadband wireless access development and manufacturing companies in the world. Headquartered in Malta and with global offices, the company has a history that spans more than 22 years and claims its “innovative approach in research and development

has resulted in a range of advanced fixed wireless connectivity solutions that are a perfect fit for many requirements”.

InfiNet Wireless says it has more than 500,000 deployments from the “plains of Siberia to the deserts of the Sahara” and, as global VP of sales and marketing Kamal Mokrani explains, its involvement with Africa goes back a long time.

“Our key activities initially centred around the southern and northern tips of the continent. During this time, we worked with various end users to deploy wireless infrastructures in the oil and gas sector, the WISP marketplace and homeland security in various countries.

“Over the past year alone, we have completed major projects in Egypt, one of which was to provide the Cairo authorities with a complete ‘Intelligent Traffic Solution’ based on our wireless platforms.

“Working closely with a number of other suppliers as part of a consortium, we ultimately deployed a brand new infrastructure to help ease congestion around the city, reduce pollution levels and significantly increase productivity by minimising the time people spent travelling in their cars.

“This infrastructure is now fully operational and, over the next year or so, similar solutions will be deployed in other parts of Cairo itself and other big cities in the country.

“Another recent project delivered very recently was with Icosnet, a major WISP in Algeria. This service provider is mainly focused on providing internet connectivity to the enterprise market, with an even greater focus on foreign entities operating in the country, such as financial institutions, energy companies, manufacturing, etc. Our solution offered this service provider a future-proof platform upon which to build its commercial strategy.”

When asked how InfiNet Wireless has seen Africa’s wireless communications market evolve in 2015, Mokrani says the continent is so diverse that it is impossible to apply a blanket statement or generalisation about the region, especially as each country and its economy is now at a different stage of growth.

“We have to constantly adapt our approach and overall strategy on a country-by-country basis as each one presents us with its own challenges. Wireless solutions like ours are often classified as sensitive by most local governments, and importing into the country is often hampered by regulatory barriers, making it difficult for service providers of all types to deploy the latest wireless technologies and compete with the incumbent (usually state-owned) service providers.

“Lack of funds for local entrepreneurs to provide internet access, among other services, is also another slowing-down factor in the adoption of new technologies across most of Africa.

“On a positive note, the changes that occurred in recent years with the introduction of 3G technology, now being followed by mobile broadband based on 4G/LTE, have been substantial. The aggressive consumer adoption of mobile devices due to the lack of adequate fixed infrastructures has leveraged wireless technologies, and we are now becoming a key player in relieving the backhauling pressure experienced by mobile operators.

“We are also seeing a huge demand in homeland security. To respond to such a need, we have further enhanced our existing solutions to carry even more data within the same available spectrum, and provide high definition video streams to allow all the usual analytics (e.g. face recognition, ANPR, etc.) to be undertaken by the local and regional law enforcement agencies.”

As he continues to talk about the hurdles that need to be overcome, Mokrani believes that the two biggest challenges in Africa remain the regulatory barriers and a serious lack of adequate funding.

“Everybody agrees that technology in general is a key driver to improve people’s lives and the local economies in general. But without a good telecoms infrastructure, it is going to be difficult to achieve any major step forward.

“Nobody will invest in a particular country if their investment is not protected by a strong regulator. Such regulation – and ultimately a fair and more efficient use of the available radio spectrum – is what we see as a real challenge in Africa.”

“There are other challenges as well, mainly linked to political situations in various countries. For example, a market such as Libya – which was very good for everyone in the past – has reached a ‘no-go’ stage, and it is practically impossible to even ship anything to the country.

“Other challenges expected to happen elsewhere are to do with previously approved budgets for telecoms infrastructures which are

now being reallocated by some governments to homeland security. This is ultimately good news for us anyway since we are also active in this area, but it does create a certain level of uncertainty going forward and planning from the business point of view.”

Mokrani says like any other vendor, InfiNet Wireless’ goal over this year is to establish an even bigger footprint in Africa, adding that the company’s wireless solutions are “ideal” for the terrain and are often the “best” available alternative due to a serious lack of wired infrastructures.

“In some of the more developed markets in Africa, we are aware of various initiatives supported by the governments who want to bridge the digital gap between the cities and the urban areas. There are big plans in place in a handful of countries, some of which even have approved funding.

“Our biggest activities for the next 12 months will be focused on significantly increasing market awareness in the region, not just about InfiNet Wireless, but also about the possible applications of fixed broadband wireless access.”



Mteto Nyati,
Chief enterprise
officer,
MTN Group

Cisco, Ericsson, and others have made some big predictions about the growth of the global market for machine-to-machine communications and the Internet of Things during the coming years. But does any of it apply to Africa? As part of a feature first published in

the May-June 2015 issue of *Southern African Wireless Communications* magazine, MTN’s Mteto Nyati explained that the IoT/M2M opportunity on the continent is very real.

“It is no longer a matter of if or when IoT/M2M will take off, as we have seen developments in this area from as far back as six to 10 years ago. Reflecting on SCADA (supervisory control and data acquisition) and the inception of machine-related data communications, it is clear that we have the building blocks and now need to enhance and facilitate greater efficiencies with our own solutions.

“How IoT is used and what that means for customers are the questions that need to be asked. At MTN we have looked in depth at what IoT could mean for our markets. We believe that Africa and the Middle East are primed for high levels of penetration, as these are the markets where efficiencies and M2M services are required the most.”

If there is a real market appetite for such solutions in the region, what’s driving it? In

answer to this, Nyati said Africa has a unique set of problems that cannot be compared to other territories.

“The continent faces issues largely related to health, environmental sustainability, public safety and agriculture. Underpinning these are the constraints faced in relation to connectivity and data costs. Therefore, there is certainly an ‘appetite’ for solutions to address the aforementioned problems. By addressing these we create a viable ecosystem to drive solutions and adoption thereof.

“A key focus for MTN in this respect is providing solutions to address the need for basic necessities like clean and drinkable water, driving energy efficiencies, economic inclusion and citizen engagement.”

But as Nyati points out, developing and deploying solutions are dependent on expertise, platforms and connectivity, which in turn are all affected by the infrastructure or lack of infrastructure in place. So how does MTN expect to overcome these challenges and what exactly has it done in developing Africa’s IoT/M2M market?

In May 2015, MTN’s Business division unveiled what it described as the first “truly” pan-African IoT platform to provide enterprises with “greater control and advanced management features” for their connected devices and SIMs. At the time of the announcement, the platform had already gone live in South Africa and other MTN operating countries were expected to follow throughout the year.

“We believe that MTN’s IoT environment has eased the above mentioned dependencies by providing a dedicated IoT management platform which runs on a dedicated IoT network.” said Nyati. “This allows us to provide a consistent service experience across our footprint and manage costs accordingly. With the addition of an open architecture SDK and API, we have opened our toolsets to allow the developer community in Africa to build African solutions to address our uniquely African problems.”

In terms of wireless technologies, we asked him what should be used to deliver these solutions effectively. With cellular, satellite, Carrier Wi-Fi as well as fibre now all available, Nyati believes the choices for connectivity are evolving almost as quickly as the IoT landscape itself.

“What may work today may not be the best solution in five or ten years from now. As noted, the challenges we face in terms of connectivity on the continent limits how intensive some solutions should be.

“However, this also provides an opportunity to optimise how we deliver solutions. We have seen that the bulk of solutions to address the immediate requirements can work on 2G networks and innovators have found brilliant ways of making this work at levels expected from higher bandwidth services against our unique challenges. As an evolving ICT provider, we believe all technologies have a role to play in delivering solutions effectively.”

In terms of the future for the IoT/M2M in Africa, Nyati said that as service availability, processors, sensors and development workbenches become increasingly cheaper, spurring innovation to problems encountered on a daily basis, we will ultimately see the emergence of smarter societies and efficient management of utilities and resources. He added that the knock-on effects of this relate to increased economic activity and growth.

“Focus will ultimately span beyond immediate issue resolution to forecasted solutions on yet undefined problems, allowing for further innovation along all verticals of service.

“We envision wide scale adoption of M2M services. There will be solutions to help governments work more efficiently and further improve their engagements with citizens; and businesses, both large and small, will be able to save time, increase productivity, reduce costs and take full control of their businesses, among other benefits.

“The future for Africa through IoT is bright, and MTN aims to assist and drive this activity as part of our key strategic objectives.”



Lux Maharaj,
Strategic account
manager
Intracom Telecom

Intracom Telecom is a global telecommunication systems and solutions vendor operating for more than 35 years in the market. Headquartered in Greece, the company specialises in innovative products for self-organising network (SON) small cell backhaul, ultra high capacity wireless transmission, broadband wireless access, and smart software communication platforms.

According to strategic account manager Lux Maharaj, Intracom Telecom has brought solutions to demanding telecom markets which have been deployed worldwide. “Our products use the most advanced, field proven technologies, achieving and exceeding the level of performance required by modern applications for wireless access and backhaul.”

In Africa, Maharaj says the company has enhanced its presence on the continent with the establishment of INTRATELECOM SA in South Africa, as well as a subsidiary under the same name based in Rabat, Morocco.

Intracom Telecom has been active in South Africa since 2010 and is now, says Maharaj, the “supplier of choice” for large WISPs and telcos in the country, especially with the deployment of the *WiBAS* point-to-multipoint (PMP) radio product line. So how has the company seen the wireless communications market adapt and evolve in Africa in 2015?

“An important trend is that of high speed broadband access, via wireless, aiming to provide broadband connectivity to as many as possible subscribers who presently are impacted by the digital divide,” says Maharaj. “The African market seeks a way to improve competitiveness and access to information for its inhabitants.

“The unlicensed band has become congested with many operators realising that it is an unreliable service, despite the



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- » All Outdoor SW-Defined Compact Radio
- » 1024-QAM
- » Secure Networking
- » SMB/SME Broadband Access
- » Guaranteed Bandwidth




INTRACOM
TELECOM

attractively lower cost of customer terminals. Despite the preference for fibre, its costs, installation times, issues with rights of way, as well as fibre cuts and long repair times, have all resulted in PMP becoming the preferred alternative for deploying a service – typically within 48 hours of a customer request.”

Maharaj says Intracom Telecom has also seen the enterprise market begin to demand higher capacities, SLAs and guaranteed services. As a result, operators have started evolving their unlicensed band enterprise services to licensed band PMP.

So what does the company see as the challenges for the continent in 2016 and beyond?

“The need to provide broadband coverage, either due to regulation and international agreements (e.g. UN charter of human rights), or because of the need to create infrastructures for economic growth, mean increased outdoor coverage is required to reach out to citizens away from major city hubs. The quickest way to do this is to deploy inexpensive technologies – Wi-Fi hotspots in suburban and rural areas, and the roll out of rapid data services under centralised control with SDN.

ISPs are looking for alternatives to migrate their WiMAX networks and regulators are receiving a barrage of applications for spectrum in the 10.5GHz and 26GHz bands. Ownership of channels in 10.5GHz has become a critical requirement for operators particularly in West and Central Africa – mainly due to the distance limitation of higher frequencies in their high rain rate regions.”

So what are the company’s plans over the next year or so?

“With the establishment of the new subsidiaries, the Intracom Telecom group expects to boost business significantly in the South African market as well as in the sub-Saharan African region, targeting ISPs and mobile operators. From the Rabat office, we aim to come closer to better serve clients in North West Africa.”

Maharaj goes on to say that the company also expects to assist regulators and operators in formulating strategies to provide high capacity, SLA-based and guaranteed services to the residential and enterprise markets. To support

this, the firm has recently introduced the new *WiBAS Connect* PMP terminal radio, which operates in the 10.5, 26 and 28GHz bands, for residential and SMB subscriber access.

“With this radio, the company aims to provide broadband connectivity to as many subscribers as possible who presently are impacted by the digital divide. We will therefore improve competitiveness and access to information for the region and other underserved areas offering high capacity QoS.

“Furthermore, Intracom Telecom expects to assist governments and municipalities in implementing street-level solutions for civil, security and traffic monitoring applications. The company can address this need with its truly groundbreaking *StreetNode* products that are specifically designed to meet the multiple challenges of deployment at street level on lamp posts, bus stops and on walls.”

Maharaj claims *StreetNode* “revolutionises” the architecture of small cell wireless backhaul because of its software defined radio operation, switching between PTP and PMP mode without HW and SW changes, to accelerate chain or hub and spoke deployments. He adds that it is controlled by an intelligent SON manager which simplifies provisioning, ensures service availability, automates optimisation, and can be connected to the network within a few minutes.



Nick Ehrke,
Sales director,
Southern Africa,
RADWIN

Established in 1997, RADWIN provides a full suite of wireless point-to-point, point-to-multipoint 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.

Southern Africa sales director Nick Ehrke says the company has enjoyed “enormous success” over the last 12 months, and has seen an “incredible increase” in its key market of enterprise broadband.

He adds that the firm’s carrier business has also grown particularly well due to the success of its *JET* portfolio, which he describes as a “real disruptor” in the marketplace.

“We have seen uptake across the board from both existing and new customers, as the advantages of *JET* are readily apparent,” says Ehrke. “The demand for data on the continent continues to grow exponentially. Networks are expanding rapidly, but just not rapidly enough to satisfy the demand for data by both business and consumers.

“Right now, we are seeing fibre being rolled out extensively, and this is having a negative impact on microwave as backhaul and trunk links are being replaced by fibre. However, it has not had any impact on the broadband services.

“Currently, it is common for an operator to say that they have fibre running past 50,000 or 150,000 homes. But the operative word here is ‘past’. Operators are still struggling with the ‘last mile’. What we are seeing is a move to rapid deployment, where wireless is a catalyst to growth due to the lower cost, particularly when compared to traditional fibre trenching or replacing expensive copper networks that are still being targeted by thieves.

“An LTE network is expensive, and typically networks do not have enough spectrum to meet the capacity and throughput demanded by users. Plus of course, it is designed for the residential market and not for the enterprise.

“LMDS (or microwave point-to-multipoint systems) are still prohibitively expensive – both in terms of spectrum as well as equipment costs – and has currently priced itself out of the market. So at RADWIN we find ourselves in the enviable position of being the leading solution for the ‘last mile’ among operators due to the numerous advantages of our *JET* platform in both licensed and license-exempt applications.”

Ehrke goes on to claim that almost every operator, carrier, ISP and WISP in sub-Saharan Africa is presently considering deploying the platform on their network due to the benefits that it delivers.

So while RADWIN can help service providers overcome some of the technical challenges, deploying a network is still very capital intensive, especially in Africa where, as Ehrke points out, local currencies have depreciated against the US dollar (for various political and economic reasons), putting further strain on operators and ISP budgets.

“Operators are trying to do a lot more with less, and with less buying power in an ever increasing demand environment. While networks are costing more, capacity requirements have increased exponentially; we have seen a network that was designed to deliver between 2Mbps and 8Mbps, but the actual demand is for 20Mbps and 40Mbps services – a ‘fibre type’ service. So the challenge for networks is to not only meet the new demand for these speeds, but to look and invest for the future.

“RADWIN research predicted such demand, and we are the first to market with 100Mbps and 250Mbps CPE in a point to multi-point environment. With our new *JET* platform we can deliver 3Gbps with a four sector high site. That’s unparalleled in the industry”

¹ www.ustda.gov/news/pressreleases/2013/US/SGT_ZakSmartGridOpps_111913.pdf

² <http://electronicsmaker.com/sub-ghz-wireless-design-choices-for-smart-metering>

³ <http://africanbusinessmagazine.com/sector-reports/infrastructure/will-africa-take-lead-internet-things/#sthash.2zr0HASE.dpuf>

⁴ As above

⁵ Small Cell Deployment Strategies and Real-Time Analytics - www.gartner.com/doc/2712418/market-trends-small-cell-infrastructure

Ehrke says the company's continued aim is to continue to develop innovative products with leading edge technology. "We are at the cusp of the wireless technology market, bringing unique solutions to our customers so that they stay at the forefront of their market."

"Today, RADWIN leads the enterprise market, with virtually every major operator in Africa having deployed and relying on [our solutions] in their networks. We plan to leverage this leadership in the enterprise sector and help our operators reach an even wider market. We will expand on the current benefits of our Jet multi-service platform and offer increasing operational simplicity, further our customers service sales cycle, reduce installation times, reduce network complexity, and automate as much as possible, ensuring we return even more value to our customers."

"It is imperative for customers, whether a consumer, small business or large enterprise, to be able to access data that is reliable and sufficient for their needs."

"From RADWIN's inception, we have really only had one conversation with our customers: if downtime results in loss of revenue, loss of reputation, or in extreme cases, loss of life (consider a hospital, or emergency services network), then RADWIN is the right network for you. And the good news is that most operators, carriers and ISPs agree."



Robin Kent,
Director of
European
operations,
Adax

Adax specialises in network infrastructure such as LTE-EPC to replace WiMAX and fixed broadband, high-density signalling solutions to meet the needs of today's smartphone users, interfaces to work between legacy networks and protocols, and much more.

The US-based company covers Africa from its European headquarters in the UK, and lists Comviva, Ericsson and Nokia among the many customers who have used its signalling solutions over the last 35 years.

The company's Robin Kent points out that part of the customer service coffee shops now offer is free Wi-Fi. He reckons that what may once have been considered a relative luxury is now an expected service, with many customers using their local coffee shop to work, study or simply just to browse the internet.

But he warns that free Wi-Fi is a "potential money pit" if the business providing this service isn't utilising the vast

possibilities that Wi-Fi access offers in terms of business gain.

"Businesses have the opportunity to turn the cost of an expected convenience into a revenue stream, at the same time as enhancing customer experience and brand loyalty."

"Wi-Fi is a guaranteed route to internet access – at least it is when you compare it with the standard mobile networks (3G/4G), which are not always 100 per cent reliable, but it's not always perceived in that way. The process for accessing retailers' Wi-Fi is not always a smooth one, with some requesting users to sign up using quite lengthy online sign-up forms."

"With so many users 'on the move', it's unrealistic to expect adherence to a sign-up process that can take five minutes. Yes, that may not seem that arduous, but when you only want internet access to check the price of a specific product or the location of a store in a shopping mall – the five minutes it takes to sign-up to the Wi-Fi, doesn't seem worth the time spent. The user will just choose to rely on patchy 3G or 4G coverage to access the internet."

"This is a problem for both the retailer as well as the mobile operator. Bearing in mind the retailer, in most cases, is also the Wi-Fi service provider, if the user is in the store's Wi-Fi coverage radius, the retailer will lose out when it comes to user engagement."

"Retailers rely on consumer information and interaction to [improve] the service they offer and to provide a more targeted marketing strategy. If the consumer is relying on their 3G or 4G network, it's harder for retailers to manage consumer interactions."

"From the operator's perspective, the problem of data overload is potentially significant. If you imagine, hypothetically, that in a big shopping mall every retailer that provides a managed Wi-Fi service is suffering from downtime, consumers will resort to their standard mobile networks. If everyone in the mall is doing this then there are obvious concerns for operators who are trying to manage the data flow through the Wi-Fi."

"Retailers and operators can have a mutually-beneficial relationship when it comes to network provision. For instance, retailers who own their own networks can offer access to operators for a fee which will help operators manage the data overload, and similarly operators can offer managed Wi-Fi services to retailers for a fee. Hence, there is an obvious cost-saving implication for retailers that are anxious about investing capital and operational expenditure in Wi-Fi."

"Wi-Fi is growing. According to market

trends analysis from Gartner, carrier-grade Wi-Fi hot spot locations are increasing and small cells, which are vital to effective 3G data offload, are expected to capture 26 per cent of smart device traffic by 2018. This gives some indication as to how significant Wi-Fi is in reducing the data pressure on the 3G and 4G networks."

"The importance of small cell technology is best seen in the retail space. There is a clear benefit when it comes to alleviating pressure on other licensed spectrums, but the added benefit to retailers is that real-time analytics can be performed far more accurately using small cell Wi-Fi nodes, as opposed to macrocells, which typically serve a larger radius. Small cells just have greater precision when it comes to data analytics."

"In terms of customer engagement, small cell deployments give retailers access to real-time analytics, which in turn allow them to offer a more targeted and personal marketing approach, based on a customer's location or previous purchasing patterns."

"Managed Wi-Fi networks give retailers critical and hugely valuable information that can help determine everything from the most effective store layout to the consumer's experience while in-store."

"It's not just conceptual either; the data that retailers can use from their Wi-Fi managed network gives very specific information that can be used to directly improve sales by appealing to shoppers' preferences and tendencies."



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In focus: Broadband

Broadband: the most powerful weapon governments have to support national development



International
Telecommunication
Union

As well as marking the ITU's 150th anniversary, 2015 was the year when the UN's Millennium Development Goals (MDGs) were due to have been met.

The MDGs were adopted at the turn of the century, and among the targets

they were expected to hit was increasing internet access around the world. While the proportion of households in the developing world with access was more than 34.1 per cent by the end of 2015, it fell short of the goal of 40 per cent. In sub-Saharan Africa only one in nine households was connected.

UN members have now adopted 17 Sustainable Development Goals (SDGs) which cover a variety of issues, and the targets they aim to hit by 2030 include building resilient infrastructure, the promotion of inclusive and sustainable industrialisation, and the fostering of innovation.

At a meeting held in Dubai in March 2016, the UN's Broadband Commission agreed that broadband networks, services and applications have enormous potential to deliver dramatic results in education, health and socio-economic growth. It believes high-speed networks will be a key factor in achieving all 17 goals.

The organisation also discussed the importance of adding new targets to measure the utilisation of selected broadband-enabled public services, the choice of statistical indicators to accurately gauge broadband access at the country and community levels, as well as the choice of data sources and methodologies for generating accurate, reliable measurement.

It agreed that 'National Digital Scorecards' should be developed to measure a country's progress towards achieving broadband targets.

The Broadband Commission's 60+ leaders and experts from government, UN agencies, civil society and a broad spectrum of business sectors will now work to formulate concrete, measurable broadband connectivity goals that could be agreed by the next full meeting to be held later this year in New York.

ITU secretary-general Houlin Zhao said agreement on new targets in September will serve as the next stepping stone to the commission's vision of 'broadband for all'.

Zhao also serves as co-vice chair of the Broadband Commission alongside UNESCO director-general Irina Bokova. She believes the world is going through a "staggering confluence" of emerging technological breakthroughs that can open vast new horizons for growth and development.

"There remain 1.3 billion people without electricity today, and over four billion people without access to the internet. Access and connectivity are absolutely crucial for societies across the world. This is why the message of the Broadband Commission for sustainable development is so important," said Bokova.

Established in 2010 as a top-level advocacy body promoting broadband as an accelerator of global development, the Broadband Commission is chaired by Rwandan president Paul Kagame and Mexican telecoms tycoon Carlos Slim Helú.

Time for an 'information revolution'

According to the ITU's *State of Broadband* report published in September 2015, broadband internet is failing to reach those who could benefit most, with 57 per cent of the world's people still offline.

In a document entitled *Transforming our world: The 2030 Agenda for Sustainable Development*, the UN says "the spread of ICT and global interconnectedness has great potential to accelerate human progress and to develop knowledge societies". The document sets out ambitious ICT development targets in the goals agreed for education, gender and infrastructure, with ICTs recognised as a 'means of implementation' for all SDGs.

The document says there is now a great deal of evidence that states affordable and effective broadband connectivity is an essential enabler of economic growth, social inclusion and environmental protection.

The ITU points out that although figures for global mobile penetration seem to suggest that most of the world is now connected, in reality the digital divide is proving "stubbornly persistent" with regard to broadband access.

According to the ITU's latest data, while 43 per cent of the world's population is now online with some form of regular access to the internet, around 4.2 billion people still have no regular access.

The situation in the 48 UN-designated Least Developed Countries (LDCs) – which mostly include African nations – is particularly critical, with more than 90 per cent without any kind of internet connectivity. The lowest levels of internet access are mostly found in sub-Saharan Africa, with internet available to less than two per cent of the population in Guinea, Somalia, Burundi, Timor Leste and Eritrea.

One of the hurdles that needs to be overcome is extending last-mile access to infrastructure to remote and rural communities. But there are worrying indications that internet growth globally is slowing as broadband services extend out of

urban areas to these more remote and less densely populated areas.

However, empowering people via broadband needs much more than infrastructure alone. Among the billions who are still offline, many may be unaware of the internet's potential or cannot use it because there is little or no useful content in their native language. Extending access must therefore be accompanied by the development of relevant content in different multimedia forms and new services, such as e-commerce and payments in local languages, for example.

Countries need to adopt effective policies and strategies to make broadband available, affordable and accessible. An 'information revolution' is needed to help inform and improve policy-making. Public and private sectors must work together in close partnership to achieve broadband for all.

It is now more important than ever that developing countries prioritise digital development in order to enhance their national competitiveness and to deliver tangible improvements in their citizens' living standards and welfare, including closing gender gaps in access to ICTs and broadband.

Investments in broadband must be combined with new investments in training and education to ensure that every woman and man has the skills and capabilities, as well as the opportunities, to make the most of ICTs and new technologies for human rights and dignity, for social inclusion, for poverty eradication and for sustainable development.

RANK	ECONOMY	SUBS. PER 100 CAPITA
25	Libya	80.6
59	Cape Verde	51.3
67	Tunisia	47.6
74	Egypt	43.5
105	Sudan	27.2
106	Morocco	26.8
108	Côte d'Ivoire	24.6
110	Senegal	23.7
112	Algeria	20.8
120	Uganda	14.7
122	Mauritania	14.4*
125	Sierra Leone	13.0*
130	Nigeria	11.7
131	Mali	11.3
135	Congo (Rep.)	10.8*
138	São Tomé & Príncipe	9.8*
139	Burkina Faso	9.6
142	Kenya	9.1
143	Gambia	8.0
146	Liberia	7.6
147	Ethiopia	7.5
162	Malawi	4.1
164	Djibouti	3.2*
168	Benin	2.8
169	Guinea	2.2*
171	South Sudan	1.3
173	Somalia	1.0*
175	Niger	0.9*
177	Burundi	0.5*
178	Central African Republic	0.3*

SOURCE: STATE OF BROADBAND REPORT, ITU, SEPTEMBER 2015

Active mobile broadband subscriptions per 100 inhabitants in Northern equatorial African ITU member states, 2014. *ITU estimate.

Africa has a long way to go – but is on its way

Broadband internet is failing to reach those who could benefit most, according to the 2015 edition of the ITU's *State of Broadband* report. It stated that while broadband internet access is reaching near saturation in the world's rich nations, it is not advancing fast in the developing world.

The report revealed that 57 per cent of the world's population remains offline. The situation in the 48 UN-designated 'Least Developed Countries' – which mostly include African nations – is particularly critical, with more than 90 per cent of people without any kind of internet connectivity.

The lowest levels of internet access are mostly found in sub-Saharan Africa, with internet available to less than two per cent of the population in Guinea, Somalia, Burundi, Timor Leste and Eritrea.

In its table of 189 member states with active mobile-broadband subscriptions per 100 inhabitants, the ITU ranks the top three countries as Macao (China) Singapore and Kuwait, respectively. Libya is the first African nation to appear in the table. Cameroon, Chad, Equatorial Guinea, Eritrea, Gabon and Guinea-Bissau all ranked at the bottom with a zero or an estimated zero number of active mobile broadband subscriptions per capita.

The union said among the challenges that need to be overcome to expand web access is to create a truly multilingual, multicultural internet, and make services and devices more affordable. The cost-effective rollout of networks into remote and rural areas is also a key obstacle.

The ITU said one factor contributing to the slowing of internet growth is that the business

JANUARY 2015

MENA Submarine Cable System has deployed Infinera's *DTN-X* platform across its trans-Egypt terrestrial network. Infinera said its *Intelligent Transport System* provides multi-terabit capacity and network services to MENA, and will enable it to differentiate its services and manage costs as it scales. A subsidiary of Orascom Telecom Media and Technology, MENA owns and operates a submarine system that connects Egypt to Greece, Italy, Oman, Saudi Arabia and India. This latest deployment will enable it to provide wholesale carriers with terabit capacity as well as a range of connectivity services from STM-1 to 100Gbps.

FEBRUARY

iWayAfrica has become one of the first ISPs in the region to offer global bandwidth as

a service to enterprise users in Zimbabwe. With its MPLS-like managed solution, iWayAfrica claims business networks gain the advantage of guaranteed international bandwidth, visibility of their global traffic broken down by applications and sources, and the ability to define intricate priorities and policies. The cloud-based service is enabled by DiViNetworks which specialises in software-centric network systems. Unlike other MPLS or DPI solutions, DiViNetworks says its service does not require any CPE or capex investment.

MARCH

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

offer "unprecedented business expansion possibilities". CETel will use *Arabsat-5C* which orbits at 20°E along with its own teleport facilities and services across Africa, the Middle East, Europe and Central Asia. Arabsat and CETel say extended C-band offers not only trunking and backhauling applications but also corporate network connectivity between regions and continents.

APRIL

Botswana has launched a cybersecurity project that will help it make the most of open access to the internet without the fear of being targeted by hi-tech criminals. Speaking at the CTO's *Commonwealth Cybersecurity Forum* held in London, Botswana's minister of transport and communications Tshenolo Mabeo said the

case for service providers is less compelling for the areas in which the remaining 57 per cent of unconnected people live. It cited the World Bank and its call for the private sector to take the lead in providing internet infrastructure and services, but noted that public investment or intervention is sometimes justified where the private sector is unable to provide affordable access.

The union also recommended levies on operators to finance USFs, mandatory infrastructure-sharing, and government-led national strategies. Africa certainly needs to be ready. According to Cisco's 2015 Visual Networking Index (VNI), annual IP traffic is forecasted to triple over the next four years to reach a record two zettabytes globally in 2019.

Factors expected to drive traffic growth include global increases in internet users, personal devices and M2M connections, faster broadband speeds, and the adoption of advanced video services. Doug Webster, Cisco's VP of service provider products and solutions marketing, said: "It took 32 years – from 1984 to 2016 – to generate the first zettabyte of IP traffic annually. However, as this year's VNI forecasts, it will take only three additional years to reach the next zettabyte milestone with more than two zettabytes of IP traffic annually in 2019." In Middle East and Africa, the index predicts mobile data traffic will grow 15-fold from 2014 to 2019, and will reach three exabytes per month by 2019, up from 199.5 petabytes per month in 2014.

The good news is that companies are already moving to satisfy this increasing demand. April saw Liquid Telecom claim to take the crown for the fastest broadband speeds available in Africa, at the time, with the launch of its new fibre-to-the-home (FTTH) service in Zambia.

Liquid, under a joint venture with power transmission and distribution company, Copperbelt Energy Corporation, launched *Fibroniks*, a new FTTH service that is claimed to deliver superfast speeds of up to 100Mbps. The service was initially launched for around 8,000 homes and businesses in Lusaka including the areas of Rhodes Park, Northmead, Long Acres, Sunningdale and Kabulonga.

Another massive boost to Africa's long-term broadband ambitions comes from TI Sparkle who teamed up with DE-CIX to establish an internet exchange (IX) as a key landing site for online traffic to and from Africa, the Middle East and the Mediterranean region

The new exchange is designed to allow carriers that land their IP backbones in Sicily to directly interconnect with each other and to other providers that have a presence in the hub.

"Our partnership with DE-CIX and their new IX node in our Sicily Hub is the most important milestone in the creation of a massive IP gravitational centre in the middle of the Mediterranean," said TI Sparkle CEO Alessandro Talotta. "We will be able to better serve ISPs in the area, including Africa and the Middle East, by bringing worldwide content directly to their doorsteps."

Increased cable is the key

Ever-increasing demand for broadband means that Africa's global connections will need upgrading or new cables being laid.

Deals to lay two new cables connecting Algeria to Spain and Angola with Brazil were signed in 2015.

Infrastructure company Alcatel-Lucent signed with the Algerian Ministry of Post,

Information Technology and Communications (MPITC) to build a 560km fibre optic undersea cable that will link Oran in Algeria to Valencia in Spain. The cable system has been given the name 'Orval', and is expected to be completed sometime in 2016.

When fully operational, the system will deliver 100Gbps but has an ultimate design capacity of 20Tbps. This projected speed and capacity will enable the delivery of broadband services to an estimated 42 million internet users in Algeria and Spain, claimed Alcatel-Lucent.

Also, Angola Cables signed a contract to build the world's first submarine cable system across the South Atlantic. The international wholesale carrier will work with NEC as the system supplier. Stretching 6,165km, SACS (South Atlantic Cable System) will connect Angola with Brazil, directly linking Africa to Latin America for the first time.

In Angola, it will land at the Sangono cable landing station near Luanda, while the Brazilian landing point will be at a purpose built data centre in Fortaleza. The total amount of investment for SACS is estimated to be around USD160m. It will feature four-fibre pair cable and optical transmission technologies with an initial design capacity of 40Tbps (100Gbps x 100 wavelengths x four fibre pairs). Construction is expected to begin before the end of 2015 and the system is targeted to be ready for service during Q4 2016.

Along with new cables, existing connections have also been upgraded.

The West Africa Cable System (WACS) was upgraded for the first time since it was commissioned in May 2012. Phase 1 of the upgrade was completed in July 2015 and focused on the 'Express Fibre Pair' (Fibre Pair 1) between

project is important to "guard the safety, security and resilience of cyberspace, so that we can enjoy its socio-economic benefits".

MAY

NAPAfrica warns that without innovative approaches to bridging the digital divide, Africa is unlikely to ever have full access to critical information. It said the continent has yet to fully realise the benefits of peering which is currently under-utilised. NAPAfrica claims to be Africa's largest internet exchange point, and is based at Teraco's carrier- and vendor-neutral data centre facility in Johannesburg. "There is significant proof that peering is not only fundamental, but also an essential part of any network landscape, particularly across borders," said Teraco CEO Lex van Wyk.

JUNE

The Communications Regulators Association of Southern Africa (CRASA) has signed an MoU with Ericsson to support the accelerated development of ICT policies and regulations in the SADC region. Under a three-year deal, the two will facilitate capacity building workshops aimed at the development of national broadband plans. They will focus on specific concerns related to ICT in the 15 member states of the SADC who are planning, developing or revising and amending their broadband policies.

JULY

ZTE has launched its *iRail* railway radio broadband system in Africa. It said the communication solution is based on "cutting edge" LTE technology and provides broadband applications such as passenger information

services, patrol alarm systems, and digital advertisements. ZTE entered the railway industry in 1999, and claims it was the first manufacturer to commercially introduce LTE into the sector. In Africa, the company's rail transport solutions have so far been applied in Ethiopia, Morocco and Nigeria.

AUGUST

Telecom Namibia's infrastructure continues to be a target for thieves and vandals. Since August, the operator said 12 poles have been cut down and stolen from the Erongo fibre optic backbone route which links Swakopmund, Henties Bay, Uis, Omatjete, Khorixas, Kamanjab, Outjo, Omaruru, Karibib, Arandis, Usakos and Walvis Bay. The route is also used to transmit internet data to neighbouring countries. TN has called for increased police patrols in the

South Africa and Portugal. It resulted in the addition of nine 100G wavelengths to the existing 24 10G wavelengths.

Phase 2 then upgraded Fibre Pair 2 (South Africa-Nigeria- Portugal), Fibre Pair 3 (South Africa- Angola-DRC-Côte d'Ivoire-Portugal), and Fibre Pair 4 (all landing stations), adding eight 100G wavelengths to the 32 10G wavelengths that existed across the three Fibre Pairs at the time. At the Swakopmund landing station in Namibia, an additional four 100G wavelengths were added on top of the existing eight 10G wavelengths.

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

Broadband for everyone?

Africa will undergo dramatic change in the next few years as a result of robust growth in the number of people going online, according to the Internet Society.

Speaking at the Africa Internet Summit held in Tunisia in early June 2015, Internet Society president and CEO Kathy Brown described the continent as "the frontier" for the next phase of growth for the internet. "Africa's recent economic growth rates and growing entrepreneurial spirit are combining



Internet Society president Kathy Brown said the mobile internet has transformed Africa's technology landscape.

to create a climate of opportunity," said Brown. "Advances in internet infrastructure and the meteoric rise of the mobile internet have already transformed the African technology landscape."

But she warned that there are still many barriers to overcome, such as the high cost of broadband access, online fraud, lack of local content and fragmented markets. "Africa is now the frontier for the next wave of internet progress. While there is huge potential for Africa to continue building an internet that will best serve its needs, it is critical that true collaboration across Africa's technical community, a culture of innovation and entrepreneurship forms part of this process."

According to a report produced by the society, the vast majority of Africa's 54 countries have between 0-20 per cent internet penetration. Only South Africa, Egypt and Morocco are estimated to have more than 60 per cent penetration.

Operators seem only too keen to help increase that penetration. Openserve, the wholesale division of South Africa's incumbent operator Telkom, had multiple rollouts throughout the year, including Pretoria East, and Bryanston as well as across multiple additional suburbs of Johannesburg, Pretoria, Durban, Cape Town, Bloemfontein, Kimberley and Port Elizabeth.

On top of that, the firm's MD, Alphonzo Samuels, said "Openserve is committed to Telkom's goal of reaching one million homes with fibre access by 2018, and already has the largest fibre network in the country."

Ooredoo Group are tackling another aspect of the problem, quality. The firm now using advanced technologies from Nokia to boost 2G, 3G, 4G and LTE-A networks across its global operations.

According to Nokia, Ooredoo has taken the lead in network performance across

its footprint, offering 4G+ in Qatar and Kuwait, 4G in Oman, Tunisia and the Maldives, in addition to launching the first commercial 3G in Algeria and Myanmar. The aim is to prepare for the huge data demand and to ensure what Nokia's EVP Ashish Chowdhary described as "the ultimate personal gigabyte experience".

Submarine and satellite connecting more nations

July 2015 saw construction of phase II of the ACE (Africa Coast to Europe) submarine cable successfully began, with the aim to extend from São Tomé and Príncipe to South Africa. As part of the second phase, ACE will also add Benin, Nigeria and the Canary Islands to its network.

At the time it was claimed the number of people connected by the system had risen 53 per cent to 200 million. Under phase I, which was launched in the Gambia in December 2010, ACE connected 15 West African countries to Europe. They include landlocked Mali and Niger which are linked via a terrestrial extension.

After the completion of the second phase which is due by the end of 2016, the cable will be extended to Cape Town and will cover 17,000km. Branches will also connect the DRC and Cameroon, as well as Angola and Namibia. Cameroon has also become the newest member of the ACE consortium after signing the construction and maintenance agreement in June.

ACE management committee chairman Yves Ruggeri said the addition of the country will bring more value to the cable system. He also said ACE's development continues to improve direct connectivity within Africa and to the world at large. "It will contribute to the overall objective of ACE to reduce communication costs and drive social and economic growth in Africa."

area, and is also offering cash rewards of up to NAD20,000 for information that leads to the arrests and convictions of the perpetrators.

SEPTEMBER

Kenya Education Network and the County Government of Nairobi have teamed up with the Wananchi Group for the provision of free internet in schools. As part of the USD2m *WazED* project, city authorities will leverage Wananchi's fibre infrastructure to help deliver ICT services to an estimated 2,715 schools in Nairobi County. Initially, the project will be piloted for 15 months in 245 schools. Fibre will be rolled out during the first three

months while the rest of the time will be spent on evaluating progress.

OCTOBER

Alcatel-Lucent Submarine Networks has been commissioned to build the 1,900km Sonangol Offshore Optical Cable system in Angola. The network will connect to landing points at four locations along the coast, and promises to give the country's oil and gas industry "very large" offshore data bandwidth with low latency. A high-speed connection will also be established between Luanda and Cabinda. Construction is scheduled to start during the second half of 2016.

NOVEMBER

A cut on the fibre cable connecting Annaba to Marseilles disrupted internet traffic to Algeria on 22 October. Algeria Telecom (AT) said a break on the SMW4 submarine system 15km off the coast of Annaba caused it to lose 80 per cent of the international bandwidth transiting via the cable. MECMA, the international consortium responsible for maintaining SMW4, initiated repair work but AT warned customers that this could take several days depending on local weather conditions. To mitigate the impact of the cut, AT re-routed traffic to the Algiers-Palermo cable.



ACE management committee chairman Yves Ruggeri (right) said the addition of Cameroon to the consortium “adds value” to the system. Also pictured is Camtel DG David Nkoto Emane.

The cable system supports 100G and has an upgradable design capacity of up to 12.8Tbps. Working in collaboration with its contracted supplier Alcatel Lucent, ACE has also recently tested 300G which it plans to deploy in the near future.

WIOCC claimed a first in May by connecting Somalia to fast internet for the first time. WIOCC said it had “fundamentally changed” the international connectivity landscape in Somalia with the landing of a high capacity fibre cable system that now provided a vital platform for sustainable economic growth.

Somalia had lacked direct fibre optic connectivity. The only way the country’s 10 million inhabitants could access the internet was via “expensive, inflexible and capacity-restricted” satellite links, claimed WIOCC. But in 2014, and working in partnership with local partner Dalkom Somalia, WIOCC landed the >10Tbps capacity EASsy (Eastern Africa Submarine cable system) cable in Somalia and linked it to a purpose-built landing station and data centre in Mogadishu. It took six years of work.

One big difference was a reduction in latency of up to 80 per cent. WIOCC said people had been flocking to hotels and internet cafés to experience a fast service for the first time. It added that the improved

availability, affordability and reliability of consumer mobile broadband have led to growth in mobile and social media network subscriptions.

Despite being just one of many services supported by broadband, social media has taken an interest in helping people in Africa gain access to fast internet connections. For example, under a multi-year agreement with Spacecom, Eutelsat Communications and Facebook will utilise the entire broadband payload on the future *AMOS-6* satellite. They will build a dedicated system to accelerate data connectivity in sub-Saharan Africa.

Scheduled to start service in the second half of 2016, *AMOS-6*’s high throughput satellite architecture is expected to contribute to additional gains in cost efficiency. Spacecom said the satellite’s Ka-band payload is configured with high gain spot beams covering large parts of West, East and Southern Africa, and will be optimised for community and direct-to-user internet access using affordable, off-the-shelf customer equipment.

Under their agreement, Eutelsat and Facebook will share the capacity and will each deploy internet services designed to relieve pent-up demand for connectivity from the many users in Africa beyond the range of fixed and mobile terrestrial networks.

Eutelsat said the capacity will enable it to step up its broadband activity in the region that was initiated using Ku-band satellites to serve professional users.

For Facebook, the initiative will be a continuation of its Internet.org project that aims to address the barriers that are keeping people from getting online. It plans to work with local partners across Africa to utilise satellite and terrestrial capacity to deliver services to rural areas. Facebook added that the partnership with Eutelsat will also enable it to investigate new ways to use satellites to connect people in remote locations.



Shola Taylor,
Secretary-
general,
CTO

Shola Taylor was appointed secretary-general of the Commonwealth Telecommunications Organisation (CTO) in 2015. With a career that has so far spanned more than 30 years in the telecoms industry, he has worked with Nigerian telco NITEL, Intelsat, Inmarsat and with the ITU

where he led the RASCOM (Regional African Satellite Communication) study which looked into the telecoms and broadcasting requirements of every African country.

In 1999, Taylor established Kemilinks International, a consultancy firm based in his home country Nigeria. Over the next 15 years he became even more active professionally, not only in Africa but also globally. In 2002, he was elected vice-chairman and then chairman of the ITU’s Radio Regulations Board which dealt with, for example, spectrum issues faced by global satellite operators.

“Working in an international organisation gives you a special privilege to see how the various countries have developed their networks,” says Taylor. “It shows you how they have faced challenges to create efficient systems and efficient access to orbital spectrum.”

During this period, Taylor was also an advisor to ministers in South Africa and Rwanda, and was appointed as a board member to the Nigerian Communications Commission (NCC). That coincided with the time the country adopted its first GSM system, and he was responsible for issues of interconnection and spectrum licensing.

Clearly then, Taylor brings a great deal of private and public sector telecoms experience, both in Africa as well as globally, to the CTO. Which should come

DECEMBER

Liquid Telecom Rwanda’s FTTH service is now available to homes and businesses in Kigali. With speeds of up to 100Mbps, it’s claimed the service offers the fastest-ever internet access available in the country. Liquid is investing more than USD35m in laying Rwanda’s first FTTH network which will continue in Kigali and expand to other cities in the future. It says more than 15,000 homes will be passed by the network by the end of next year. The service will also be available from mobile operators and ISPs in the country using wholesale access from Liquid.



H. Sama Nwana,
Executive director,
Dynamic Spectrum
Alliance

The year ahead: Ensuring the digital switchover across Africa in order to release the digital dividend for mobile broadband will be a good start. But this needs political will, funding and a good TMT strategy.

Inane public officials in control of TMT policy at ministries and regulators must truly realise what a brake they are on African countries. There is usually neither urgency, strategy, funding or competence with these officials. This sort of culture must go and new competences developed.

What Africa needs are visionary ministers, regulators and TMT leaders who have the commitment and management skills to execute on projects of national importance such as DSO, fibre, 3G/4G, and all whilst addressing affordability and accessibility concerns.

The business case is simple: for every 10 per cent growth in broadband subscriber numbers, there is 1.3-1.4 per cent growth in GDP in sub-Saharan markets (World Bank). So it makes simple sense to build these 4G and Wi-Fi networks, and keep doubling the speeds.

The above is an extract from a feature first published in the July-August 2015 issue of Southern African Wireless Communications.

in handy as he says there is “much work” to be done. So during his four-year tenure as the organisation’s secretary-general, what will that work entail, particularly in the context of Africa and the mission to deliver ubiquitous broadband?

“First of all there is a need to encourage regulatory certainty. There are many cases where investors are not quite clear of what a regulator might decide on a particular issue, such as spectrum, the timing of allocation, the process that is used, etc. There are also policy issues around broadband. Most of our member countries talk about broadband but unfortunately there is still a lot of work that needs to be done here.

“It is not about the technology – the technology is there. But there are a number of constraints. Why? You have mobile operators who are the main players because the fixed line operators are virtually non-existent. So you need to focus on how the mobile industry can provide the broadband that you need.

“However, mobile operators are business entities. They are there to provide services but ultimately they exist to make a profit. There are certain areas that it would not be profitable for them to go to, and broadband objectives therefore become constraints.”

While MNOs find it difficult to make the business case for remote and rural connectivity, aren’t initiatives such as so-called universal service obligation fund supposed to help here? Taylor agrees that while universal funding is working in many countries, it is the actual implementation of its real objectives that is proving to be a challenge.

“Let me give you an example. In one particular country (I won’t mention the name), one of the things the universal service agency did was to buy computers for politicians because they said they needed laptops. That wasn’t the reason why the agency was set up. So there must be a conscious effort for the agency to do what it is actually supposed to be doing. It’s not just about setting up an agency.”

He continues by saying that some of the agencies were initially somewhat clueless – they had a lot of money coming in but didn’t know how to spend it. “And because they didn’t think it through very well, money was spent on projects that didn’t really solve the problems.”

When it comes to the ongoing quest to roll out broadband networks to the unconnected, Taylor does not expect the mobile industry to work in isolation. He says while many of the big name operators carry out CSR activities which should be recognised, what governments must do is capitalise on that by making conscious efforts to do their bit.

“There are issues of right-of-ways. That’s a big challenge as operators need to have licenses from federal authorities, local authorities, etc. There are also issues of vandalism and security, and operators need to protect their systems and people in remote areas. So the government has to come in with policies that enable those who want to invest. And they should also find some other ways, such as incentives for companies to invest in those areas.”

Taylor recalls that when he was with NCC, one of the incentives used was to award operators a license for, say Lagos, provided that they also deployed networks in other and less attractive locations.

“That was quite difficult. Generally, the operators agreed and said they would go to those areas. But then they faced all kinds of issues. They were being told that they would have to pay license fees for right-of-ways, pay for every antenna installed, then the minister of environment would say there are environmental issues that need to be paid for, and then other politicians would get involved and there would be backhanders, etc.

“Government across Africa must get out of their cosy environments and do much more for the industry and create ease of access and make it easier for operators. There must be the political will to connect with the reality on the ground.”

Of course, even if and when operators and governments do manage to get internet and high-speed networks in place, what those networks actually offer becomes the next key challenge. For instance, Taylor says a lot of work needs to be done in terms of e-applications. And then, with more networks and more network users, there is the ever-present and growing threat of cyber attacks.

“One major issue that I find in virtually every country is the ability to respond to cyber threats. I see this as one of my priority objectives in the next four years. I want to see every single country in the commonwealth, including in Africa, to not only have a robust policy and strategy but also to ensure that they have the ability to implement this policy and strategy. Implementation has to involve all stakeholders.”

As explained in the introduction to this chapter on p51, the deadline for the UN’s Millennium Development Goals (MDG) came and went in 2015 but the objectives were missed. Taylor wasn’t surprised as he points out that the process of implementing the goals required much more effort than the countries envisaged.

“From the very beginning it was clear that you needed a lot of awareness building programmes and a lot of tuning in of national

programmes to the MDGs. Many countries talked about it but when you actually saw their economic and industrial blueprints, there were disconnects. Funding was also an issue.”

Taylor says the CTO will continue to support its members in achieving the new Sustainable Development Goals, but points out that the challenges need to be acknowledged. For example, he says the culture of democracy is still very new in some African countries, many administrations are bogged down by bureaucracy, there are protocols to follow when trying to engage with high ranking government officials, passing legislation in some countries can take four or five years, etc.

“So we need to deal with those constraints. There needs to be a conscious effort which says that when we go out at an international level and collectively agree to reach certain goals, the mechanism to translate those goals to the domestic environment is a big process.”

Another deadline that Africa missed in 2015 was the migration from analogue to digital broadcasting. This switchover creates the so-called digital dividend as spectrum that was previously used for broadcasting can be re-used for mobile communications and broadband connectivity.

Later this year, the CTO will host a digital switchover conference for Africa in Nigeria, and is working towards promoting 2017 as the continent’s new deadline for a digital switchover.

In the meantime, Taylor says he was “very disappointed” that African countries couldn’t meet last year’s June deadline: “Despite all the noise, the work that has been done by ITU, CTO, etc., it was not achieved. This shouldn’t have happened. By far the biggest challenge was political awareness.”

He cites an example when his former company Kemilinks was appointed as consultants for the digital switchover in Nigeria. “We were advising the committee appointed by the president and delivered our report in 2009. That report never left government offices until 2012. Three years and nothing happened. There may be reasons why that can be justified but for me the result is nothing happened.

“In South Africa, it is more or less the same story – the policy is there, they have a very robust committee that looks at it, and they have a strategy in place. But it’s all convoluted. They were more concerned about who buys set-top boxes, who does this, who does that... at the end of the day nothing was happening. And this is in the continent’s biggest economy.

“Politicians tend to be very narrow-minded. They do not see the bigger picture. They want to protect what is so small and leave out the bigger picture.”



Edward Lawrence,
Director of
business
development,
Workonline
Communications

South Africa-based Workonline Communications is a privately owned global network service provider, and says it offers high-quality IP transit and connectivity services with QoS guarantees to almost any location in the world. Its customers include some of the world's largest telecommunication companies.

According to the firm's director of business development Edward Lawrence, 2015 brought renewed investment in IT and networking infrastructure with the focus remaining on Africa and its global investors to deliver, regardless of the downturn and recovery process. He believes this is especially relevant to telecoms carriers, with the majority expecting significant returns from this emerging market.

"Considering the investments made in fibre networks, in particular, there has been an increase in solutions from carriers as a means to remain ahead of the fast changing demands of the market.

"With regards to executing and expanding fibre footprints, many carriers are looking to make use of partnerships to effectively deliver what their clients expect. These carrier investments and partnerships are critical, as businesses now require higher bandwidth fibre connectivity for internet access and other related services."

Lawrence says Workonline Communications saw a 100 per cent growth in IPv6 traffic and peers last year. For instance, he says the IPv6 traffic increase on NAPAfrica, the IXP hosted at Teraco's data centre in South Africa, grew from 10 IPv6 peers with a 2Mbps peak in August 2014, to 55 IPv6 peers and a 664Mbps peak in August 2015.

He also says there is a growing trend of collaboration which is essential if Africa is to meet its growth predictions and the worldwide economy is to see returns on its investment.

"The collaborative approach of global players leveraging regional network expertise accelerates the availability of high-quality IP transit and connectivity, and ensures that their go-to-market rates remain relevant.

"Through collaboration, we are able to extend the reach of our fibre-based connectivity to regions in the world where we are not present, while extending the reach of other global networks in sub-Saharan Africa. Our overall goal is to improve the quality of the internet in Africa, while simultaneously driving down costs and increasing market penetration."

Lawrence explains that Workonline Communications' international links connect South Africa to the rest of the world through all available routes, and are "amplified" by its partnerships with many of the world's leading global tier 1 IP transit providers.

"This allows us to provide the lowest latency world-class transit services possible to our clients across sub-Saharan Africa. Through our multiple PoPs, we offer remote peering services to international and local exchange points, such as NAPAfrica, LONAP and LINX. Collaboration of this kind ensures the stability, resilience and high quality of our global network."



In its *Mobile Economy, Sub-Saharan Africa 2015* report published in October 2015, the GSM Association (GSMA) said that the transition to mobile broadband is well under way.

"The region is seeing continued migration to higher speed mobile broadband networks. Commercial 3G networks had been launched in 41 countries across Sub-Saharan Africa as of June 2015, while 4G networks had been launched in 23 countries."

According to the report, 20 per cent of mobile connections in sub-Saharan Africa are now based on 3G, up from just five per cent in 2010. 3G The GSMA says adoption in the region will surpass the global average by 2017 and account for more than half of total connections by 2020.

The association says the main factors driving the uptake of 3G are network coverage expansions, declining device prices, and the launch of 4G technology in new markets.

"For example, Airtel Africa added 783 3G sites across its 17 markets in the region during the first quarter of 2015. In Cameroon, Nexttel launched the country's first commercial 3G network in September 2014, while MTN, which launched its 3G network in March 2015, has announced plans to extend coverage to 75 per cent of the population by 2018."

The report also points out that LTE is still at its very early stage in sub-Saharan Africa, accounting for just under one per cent of the connection base compared to a global average of 11 per cent. It says factors limiting 4G adoption in the region include a lack of greater network coverage, unavailability of LTE spectrum, and an under-developed device ecosystem which leads to high costs of ownership of mobile data connections.

"Nevertheless, 4G is gaining traction in several early-adopter markets, particularly

Angola, Mauritius, Namibia and South Africa. This has been helped by the establishment of enabling regulatory and competitive environments that encourage investment."

As an example, the GSMA cites Vodacom's 4G network which now covers more than 40 per cent of South Africa's population. It adds that the operator also launched the region's first commercial VoLTE service in April 2015 which helped it, in part, to differentiate its service from Telkom which has launched LTE-A earlier in December 2014.

The report continues by stating that 4G adoption for sub-Saharan Africa as a whole will grow to account for six per cent of connections by 2020. "Fifteen new commercial 4G networks were launched in the last year, including for the first time in Ethiopia, Kenya and Rwanda. In the technology-leading markets such as Angola, South Africa and Zimbabwe, 4G will account for around one fifth of total connections by 2020."



Sub-Saharan
Africa,
Mobility Report
2015,
Ericsson

In November 2015, Ericsson published its latest *Mobility Report* for the region. With LTE networks predicted to cover 50 per cent of sub-Saharan Africa by 2020, it says there are two basic ways in which ICT acts as a change agent across industries: efficiency improvements and service disruption.

"The introduction of mobile data services has enabled access to even more services that not only benefit individuals, but change industries as well," states the report.

Ericsson believes m-commerce is one of the great unique success stories of mobile innovation on the continent.

"It has allowed the 70 per cent¹ of unbanked and marginalised segments to start to see the promise of financial inclusion as mobile money services take form across Africa.

"Mobile operators have also been beneficiaries of this revolution. Leading operators in the region are deriving up to 20 per cent of their revenue from mobile commerce services, improving business prospects even as voice revenue growth slows.

"Starting from basic person-to-person money transfers, many platforms now provide savings, insurance and credit applications. This has further progressed to mobile commerce and stock management solutions. Purchasing goods and services is increasingly done via a mobile phone."

¹ Ericsson ConsumerLab, M-Commerce study, 2015

Citing statistics from the World Bank², Ericsson sub-Saharan Africa transfers more funds domestically via mobile money than any other region in the world. In 2014, up to 28 per cent of the population had received a domestic remittance. By comparison, only four per cent of the population in South Asia did so in the same period.

The report says the next wave of services within the region's mobile commerce ecosystem will include more mature offerings such as micro-insurance and advanced subscriber to subscriber/subscriber to merchant solutions.

For example at the end of 2015 in Kenya (which Ericsson describes as arguably the "most developed" mobile commerce market in sub-Saharan Africa, Safaricom opened up its platform to application developers, enabling design and integration of third-party solutions.

The report says that an improving regulatory environment is supporting Africa's development of mobile money, as governments increasingly realise that the widespread availability of payment and other financial services is a key pillar in socio-economic modernisation.

As is well documented, sub-Saharan Africa has faced challenges in the provision of basic health services. However, as Ericsson points out, mobile solutions are enabling the delivery of basic health services to underserved populations across the region by successfully addressing important challenges, such as cutting infant mortality rates and helping to fight contagious diseases remotely.

"Mobile technology proved to be extremely useful during the 2014-2015 Ebola crisis that afflicted parts of West Africa. In order to combat the spread of the disease, volunteer doctors collaborated with government agencies to set up helplines and social media accounts which informed and provided response on Ebola risks. This approach was particularly effective in Nigeria, which became Ebola-free within a few months."

Another example of how mobility is having a positive socio-economic impact is in optimising agriculture which, according to Ericsson, is sub-Saharan Africa's "economic backbone".

"Use of mobile solutions is helping farmers in Africa to minimise economic risk by knowing when to plant their crops, as well as reduce the time it takes to get crops to the market.

"Considering that agriculture employs more than half of sub-Saharan Africa's workforce and accounts for a third of its GDP,³ mobile-based solutions will go a long

way towards improving the socio-economic environment in the region."

As more of the region's people adopt smart and digital devices, Ericsson says new modes of content consumption are increasingly being explored and viewing habits are moving away from conventional devices. It believes local consumers increasingly want to pick and choose payment and subscription methods of digital media.

For instance in Nigeria, the company says 51 per cent prefer to watch TV and video at their convenience, 56 per cent want access to video content across all devices, and 55 per cent would like to select the media channels that they subscribe to.⁴

"Even as mobile broadband networks become increasingly accessible across Africa, satisfaction levels are low, which indicates that consumers in some places are in need of higher speeds and better quality connections."

Ericsson concludes that with low internet penetration, booming consumer spending, and a high unbanked population, sub-Saharan Africa's economic potential remains strong.

"Players in the mobile ecosystem in the region aim to support socio-economic empowerment and inclusion. At the core of this is enabling mobile broadband access to the unconnected population through increased 3G and 4G network deployment.

"This will drive uptake of services such as m-commerce and infotainment, enabling service providers to differentiate their revenue streams and at the same time offer higher value services to their customers.

"With more consumers gaining access to connectivity, and consumer behaviour subsequently changing, ICT will have a far reaching impact. While the past decades of ICT progress have shown significant promise, it has only laid the foundation for what is set to come in Africa."



George Kalebaila,
Senior research
manager,
Telecoms &
digital media,
Africa,
IDC

// Africa is undoubtedly a mobile continent. At the dawn of this century when mobile was taking off in most African countries, fixed infrastructure, later on fixed broadband, was in a poor state where it existed and non-existent in most cases except in a few countries such as South Africa.

"Mobile quickly became the *de facto* connectivity option even for the enterprise. This was a period of intense fixed mobile substitution. But with all the benefits of mobile, it has not lived up to expectations

especially to deliver the bandwidth required to support triple play or better still quad play services in Africa. Fixed broadband, and fibre in particular, provides a better alternative and it is no surprise that fibre has been steadily growing across all regions in Africa.

"Almost every major metro's landscape is punctuated with some sort of trenching for fibre deployment. In some countries, such as Kenya and South Africa, FTTx deployment is reaching a crescendo with small and large operators staking their claim. Others, such as Nigeria, Zambia, Rwanda, Ghana and Tanzania, are not far behind with varying levels of speed of deployment.

"What is common in all these countries is that the FTTx market is very fragmented with smaller players targeting niche consumer segments such as affluent estates as has been the case in South Africa. Some have called it the broadband land grab. It is reminiscent of the early days of mobile deployments in Africa when the first wave of entrants were in a race for wider coverage and subscriber acquisition.

"In 2015, IDC predicted that adoption of fibre will begin to accelerate driven primarily by increasing demand for triple play services in the consumer segment. Consequently, fixed mobile substitution will begin to slow down as fixed mobile convergence takes root especially in the enterprise segment.

"This is important because it means that the growing adoption of fibre will not be at the expense of mobile. Both will co-exist and will be used where most applicable and suited. As adoption of data centre and cloud services continues to grow in Africa, enterprises are seeking better and cost effective connectivity options to deliver the capacity required to efficiently run these services. Fibre is undoubtedly the connectivity option of choice in this regard.

"However, it seems the lessons of the mobile era in terms of infrastructure sharing and open access have not been learnt. Although there are some proponents of open access to reduce the cost of fibre deployments and allow competition based on services, at this stage it seems as if it's everyone to him/herself as operators race for widest network coverage. Once again, and reminiscent of the early era of mobile deployment, the network is a source of competitive advantage in fibre broadband.

"In those initial mobile days, every operator had a coverage map on their webpage showing how extensive their network coverage was compared to the competition. As a young network planning engineer I remember how we prided ourselves on how many sites went live each month, updating our coverage maps as

² World Bank Global Findex Database, 2014

³ World Bank Economic Forecasts, 2015

⁴ Ericsson ConsumerLab, TV and media report 2015, Nigeria

bragging rights to rival competitor network teams. At that time, the network was even more important than the services for which operators existed in the first place.

"But over the years, mobile operators have learnt that their core business was actually not the network but providing services and maintaining customer relationships. Many have since outsourced their network infrastructure and it is just a matter of time before the few other operators who are still holding out follow suit.

"Infrastructure sharing is becoming the norm rather than the exception. IDC contends that fibre broadband network providers need not relive this painful history; early on, they need to pool their resources and embrace open access to reduce the cost of network deployment and compete on the services they provide to their customers. That's where the value is, as connectivity is fast becoming a commodity, even in Africa.

"But this may not happen on providers own volition. It may need regulatory frameworks that encourage infrastructure sharing and promote competition on services and customer experience. Regulatory bodies need to step up and for once provide the direction needed to encourage open access and infrastructure sharing business models.

"Without this intervention, we will witness more chaotic application of capital investment that could have been best utilised on developing digital services to make our lives better and more interesting. Metro and country landscapes will continue to be scarred unnecessarily when a better consolidated and environmentally-friendly standard way of network rollout would have saved us the trouble of constant trenching and disruption to urban traffic and routine.

"In the medium to long term, it is common knowledge that there has to be consolidation for long-term sustainability of the industry. Economies of scale due to the low margins of connectivity business will drive this trend. Small niche players will remain important for market development but will eventually have to give way to market consolidation by big players who can exploit economies of scale for survival.

"The pace at which consolidation will take place will differ from country to country depending on maturity and stage of the development. For instance in South Africa, consolidation has already started as big players start to reflex their muscles, although some nimble small players are proving their worth.

"However, competition in these early stages is what will drive the development of the sector and help bring down cost of

the service, which is still a premium in most countries save for Kenya and South Africa.

"In the long term, fibre land grab is what will usher Africa into joining the rest of the world in enjoying the benefits of digital economy. With mobile and fixed broadband all existing side by side, we can only hope that operators and regulators alike learn from the mistakes of the past and avoid costly business models that will lead to unnecessary casualties and misapplication of capital."



Casimir Fotso Chatue, CEO, Afrikanet Oxford Consultech

Afrikanet Oxford Consultech is a telecom company registered in the UK and operates five fully redundant virtual network centres in Europe and the US using iDirect and Comtech's *Vipersat* platforms.

Through its partners in more than 20 countries in Africa, Afrikanet provides broadband internet

services via VSAT along with any necessary equipment, as well as technical support and on site training if required. With over 15 years experience, the company continues to expand its activities and cover new ground.

"2015 has been a very positive year for Afrikanet, especially regarding our involvement in the banking and microfinance sectors, embassies, regional institutions and airport management," says CEO Casimir Fotso Chatue, referring to some of the Afrikanet's projects conducted last year in Côte d'Ivoire, Congo and Cameroon.

"We have seen a big development of WiMAX technology, allowing us to help ISPs and businesses boost their products and expand their services using technologies such as LTE and 4G. It has proven very successful with our European link which undoubtedly set us apart from the competition by its reliability."

For this engineer-turned-CEO, staying on top of the latest technologies and answering customer needs with the best solutions available is a priority. Chatue believes 2016 will turn out to be an exciting year in this regard.

"The price factor will now be very volatile with the impact of Ka-band. The increase in medium and low Earth orbit satellites is presenting customers with very efficient services for an affordable price. Ka-band will be a game-changer, offering up to 20Mbps download and 2Mbps upload for only about USD100."

Chatue does not intend to miss out on this industry trend as he explains that Afrikanet is currently building plans to be

a master distributor, as well as managing deals with high throughput satellite owners to bring Ka-band solutions at a competitive price to West Africa.

"Ground solutions, fibre optics and transatlantic cables will have to take new players like O3b in consideration, and this competition should prove very interesting for both the industry and of course our customer base in Africa, who will benefit from more options and opportunities than ever to access effective, reliable broadband."

Chatue continues by saying that Afrikanet's mission continues to be about bridging the digital divide between north and south, empowering customers and bringing connectivity to the continent. As a result, he has recently announced the launch of Solar Access, a new company under the Afrikanet umbrella that is focused on solar solutions.

"Renewable energy is the future. Not only for Africa but for the world, and we are delighted to be in a position to work towards better environmental understanding, thoughtful living, and to offer our customers the opportunity to make a difference with us.

"In this day and age, businesses cannot sustain growth or answer customer needs appropriately without an effective energy plan. We have realised the need for solar solutions and renewable energy for a while, and are now filling this need, starting in two countries in Central and West Africa, and looking to expand throughout the whole continent soon."

This involvement with solar energy is not the first time Afrikanet has undertaken social and responsible initiatives. "In line with the United Nations Global Goals, we have been pushing to get involved with non-profits in Africa, offering our services and solutions, serving as liaison between the organisations, donors and philanthropists. Being a human-sized company with a dedicated team allows us to tailor each and every project individually, and to do our best to reach out and go the extra mile whenever possible.

"The objectives for this year are to keep building meaningful deals and relationship, being ready for the mass market introduction of Ka-band for customers, and being an active part of the global change towards renewable energy and universal access to the internet."



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