

south • asian wireless

For wireless comms professionals in the Southern Asian region

COMMUNICATIONS

Q3 2016
Volume 9
Number 3

- The challenges of creating green energy cell sites
- How the financial sector is banking on wireless tech
- NFV: is it essential for mobile operators?



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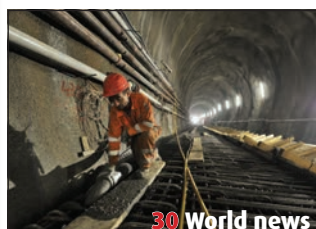
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In September 2015 NSSLGlobal formed AEROSATCOM, a joint venture created with aeronautical satcom specialist Eclipse, in order to service the rapidly-expanding government airborne satcom market.

In March 2016, NSSLGlobal acquired the majority shareholding in Marine Electronics Solutions Ltd. (trading as UK Electronic Solutions Ltd.), a specialist in installation, maintenance, supply and development of communications and navigation products and solutions for the maritime, government, offshore renewables and oil & gas sectors.

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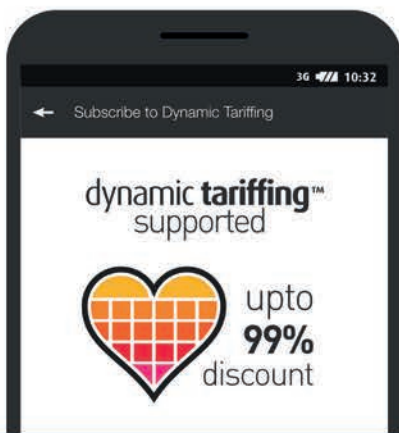
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Huge spectrum auction in India fails to hit the mark

As you read this, the provisional results of what was described as a 'mega auction' of spectrum by India's Department of Telecoms has just ended. Bidders included Bharti Airtel, Tata Teleservices, Vodafone, Idea, and Mukesh Ambani's new mobile venture Reliance Jio Infocomm.

The Indian government was selling 2,300MHz of spectrum in the 700MHz, 800MHz, 900MHz, 1800MHz, 2100MHz and 2500MHz bands.

It was hoping to raise USD83bn, but in the end the sale only brought in INR657.89bn (USD9.86bn). Local reports said just 40 per cent of the spectrum was sold, with the expensive 700MHz and 900MHz bands attracting no bids at all.

Vodafone paid INR202.8bn rupees for 2 x 82.6MHz of FDD and 200MHz of TDD spectrum across the 1800MHz, 2100MHz and 2500MHz bands. It can now offer 4G in 17 of 22 circles.

Reliance Jio Infocomm won spectrum across all of India's circles. Its INR136.72bn has bought it 269.2MHz of additional spectrum in the 800MHz, 1800MHz and 2300MHz bands.

India's largest operator, Bharti Airtel, paid INR142.44bn for an extra 173.8MHz in the 1800MHz, 2100MHz and 2300MHz bands.

But as the auction was running, the company had said it did not believe major purchases of new spectrum were needed to reinforce

its position. *The Times of India* reported Bharti Airtel CEO Gopal Vittal suggesting that his company will "fill a few gaps here and there".

Ajay Srinivasan, research director with credit ratings agency Crisil, said that unlike previous auctions, operators this time did not face business continuity issues. He expected reasonably healthy participation from incumbents to ramp up their 3G and 4G holdings ahead of Reliance Jio's entry.

"Telcos are already facing increased congestion in circles with high data consumption (mainly metros and Category A circles, which account for some 60 per cent of India's data traffic). Therefore, augmenting network capacity and spectrum holdings will be critical for maintaining their competitive position."



Intelsat 33e and Intelsat 36 start their journey to space on board an Ariane 5 which lifted-off from French Guiana.

Intelsat 33e launched successfully

Intelsat has launched the second of seven planned satellites that will use its *EpicNG* high throughput system. *Intelsat 33e* lifted off on board an *Ariane 5* rocket from Korou, French Guiana, on 24 August.

Manufactured by Boeing, the new satellite will bring high throughput capacity in both C- and Ku-bands to the APAC and EMEA regions from 60°E. It will replace *Intelsat 904* which will be redeployed.

Intelsat 33e now joins *Intelsat 29e*, the first *EpicNG* satellite which was launched in January 2016 over the Americas and North Atlantic Ocean region. Together, Intelsat says they will form a high throughput overlay to its fleet of enterprise-grade, wide beam satellites.

The company claims the new orbiters are equipped with the "most advanced" digital payload on a commercial spacecraft. They combine wide beams and spot beams with frequency reuse technology, and give customers the ability to shift capacity to match their usage needs in a particular region or timeframe.

"*Intelsat 33e* also brings us one step closer to providing the first global, fully interoperable wide beam and high throughput Ku-band broadband service", adds Stephen Spengler, CEO, Intelsat. "We remain on schedule to launch the remaining five *EpicNG* satellites. The 2018 launch of our *Horizons 3e* will complete our global coverage, adding the Pacific Ocean region."

The rocket carrying *33e* also had a second passenger. *Intelsat 36* will provide DTH services to Africa from 68.5°E, while its C-band payload will serve other customers who use this neighbourhood to distribute content to South Asia.

Sri Lankan operators claim 4.5G first

Two Sri Lankan mobile operators are claiming a regional first by trialling 4.5G LTE-A Pro technology which is capable of achieving speeds in excess of 1Gbps.

Earlier this year, Sri Lanka Telecom's mobile subsidiary Mobitel and Dialog Axiata each announced that they had demonstrated 4.5G LTE-A Pro.

Dialog said its trial was carried out on its LTE infrastructure that

was provided by Huawei. Mobitel also partnered with Huawei as well as ZTE for its lab test.

According to the latter, the prime factor behind the super-fast speeds demonstrated in 4.5G LTE-A Pro is the use of multiple carriers of spectrum to generate an aggregated spectrum block to deliver significant throughputs for end-users. It said the use of OFDM

with 256 QAM in LTE-A Pro allows easy upward scalability for higher bandwidth requirements. This higher modulation rate is coupled with up to five-component carrier and 4x4 MIMO technology to provide Gigabit speeds for end users.

Both Dialog and Mobitel plan to commercially deploy 4.5G services but at the time of writing they had yet to announce any further details.

New home for Skynet 5A in Asia Pacific

Since its relocation from 6°E to 95°E to provide global X-band and UHF coverage in the region, the ground anchor station for the *Skynet*



SpeedCast's Western Australia teleport. The company says the advanced capabilities of *Skynet* will suit the needs of the region's governments.

5A satellite in Asia Pacific has been secured with a partnership between SpeedCast International and Airbus Defence and Space (ADS).

Built by EADS Astrium, *Skynet 5A* was launched in 2007 and was the first in a series of new-generation military communications satellites used by the British Ministry of Defence and other NATO forces.

ADS completed *Skynet 5A*'s move in September of last year. The relocation was initiated to extend the *Skynet* constellation's coverage and services from 178°W to 163°E, including the Indian Ocean and Western Pacific region.

With a presence in more than 90 countries, SpeedCast International

offers managed global satellite communications services and a global maritime network. Its new partnership with ADS will build and provide on-site management for the ground anchor station that will deliver secure X-band network services.

Commenting on the announcement, SpeedCast CEO Pierre-Jean Beylier, said: "The advanced capabilities of the *Skynet* satellite will suit very well the needs of governments in the region, starting with Australia and New Zealand.

"This partnership is an important step in the development of our government business, which we anticipate to be a significant growth engine in the next three years."

Delay for largest commercial satellite constellation

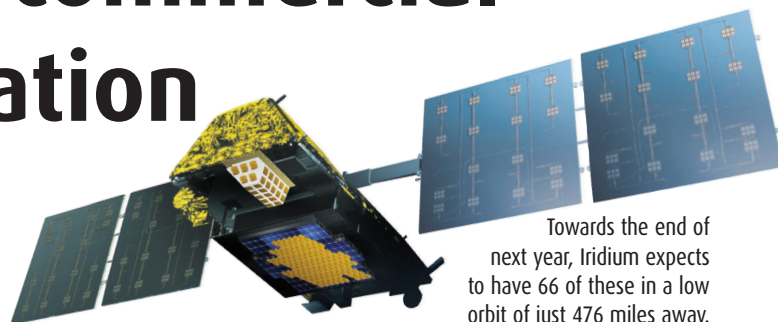
The launch of the first satellites that will form Iridium's *NEXT* fleet has been delayed.

In August, they were at Vandenberg Air Force Base being processed by SpaceX before their launch which was originally targeted for 12 September. But the loss of *AMOS-6* (see p14) has reportedly created a "bottleneck" at Vandenberg, and Iridium said SpaceX is now aiming to get back on track for a launch in November.

NEXT will comprise 66 cross-linked satellites in low-Earth orbit to deliver mobile voice and data coverage over the planet's entire surface,

including oceans, airways and polar regions. Iridium CEO Matt Desch said: "This programme replaces the largest commercial satellite constellation in space with state-of-the-art technology and new capabilities, allowing Iridium to support the connectivity needs of today, as well as those yet to be imagined."

Each satellite in the *NEXT* constellation will link-up with four others to ensure a continuous and ubiquitous meshed connection. Iridium said having a large number of fast-moving spacecraft with multiple overlapping spot beams will minimise missed connections and dropped calls.



Towards the end of next year, Iridium expects to have 66 of these in a low orbit of just 476 miles away.

It added that with each satellite orbiting at just 476 miles (780km) away, transmission paths will be shorter and signal attenuation reduced.

Working with sub-contractor Orbital ATK, Thales Alenia Space will build a total of 81 satellites for Iridium. While 66 will form the *NEXT* network, the remainder will serve as ground and on-orbit spares.

At the time of writing, the first 10 satellites for the initial launch were mated to the dispenser, and represent SpaceX's heaviest payload to date.

All 66 orbiters are expected to be launched by late 2017. Starting in 2018, Iridium said the constellation will also enable Aireon's satellite-based system to provide global aircraft surveillance in real time.

Singtel completes *Fleet Xpress* installation

Inmarsat has announced that its partner Singtel has completed one of the region's first commercial installations of *Fleet Xpress*, the maritime-focused, secure high-speed broadband service from Inmarsat. The installation was recently completed on the *Houston Bridge* container ship owned by K Line Ship Management Singapore.

As one of Inmarsat's largest partners, Singtel successfully managed the installation by migrating the vessel's Ku-band satellite internet service to *Fleet Xpress*' Ka- and L-band services. The migration involved changing the vessel's antenna hardware and

reconfiguring its complex on-board network while ensuring that day-to-day operations were not affected.

Lim Kian Soon, head of Singtel Satellite, says: "The service's high-speed broadband – which leverages our secure and reliable connectivity – allows maritime firms to introduce new business applications on-board their vessels that optimises and streamlines the management of their fleets."

K Line is using the new installation to leverage the advantages that 'Big Data' analysis can offer. It's claimed Inmarsat's service enables the firm to monitor engine performance, fleet management, as well as providing reliable ship-to-shore communications.

Global expands presence across Philippines network

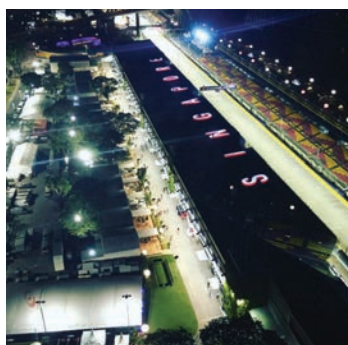
Global Telecom (GT) will use Oscilloquartz timing technology from ADVA to support its transport network across the Philippines. It's claimed that the technology, including caesium clocks, PTP (precision time protocol) grandmasters, and ADVA's network management system, will be a critical component of Global's core network.

The three-year agreement will see hundreds of Oscilloquartz devices used to deliver highly accurate synchronisation across the operator's island-to-island infrastructure.

The expansion of GT's technology base paves the way for more 4G services including instant video streaming and multimedia applications,

and will also enable the IoT to grow. To make this possible, ADVA says the new synchronisation network is one of the first to utilise the *OSA 5335* modular PTP grandmaster. It claims this device can accommodate more than 6,000 remote slaves, giving it the market's highest capacity.

Among the initial beneficiaries of the new technology will be commuters in Manila. Following the signing an MoU with the Metro Railway Transit (an attached agency of the Department of Transportation and Communication), GT will deploy wireless internet infrastructure in all MRT Line 3 stations along Epifanio de los Santos Avenue.



The self-organising microwave backhaul system from CCS delivered reliable mobile services for M1 at this year's Singapore F1 Grand Prix.

M1 mobile data users move into fast lane

Mobile operator M1 used Cambridge Communication Systems' (CCS) *Metnet* backhaul system to meet the high mobile data demand at the Singapore Grand Prix held in September.

Since its launch in 1997, M1 has gained over two million customers and become the first operator to offer nationwide 4G services. The selection of CCS enabled the company to expand its network into specialist applications such as the Grand Prix

where peak demand around the night race would have otherwise placed excessive strain on the network, thus eroding the customer experience.

According to CCS, *Metnet* is the world's only self-organising solution for wireless backhaul, supporting small cell, Wi-Fi, CCTV, smart city and enterprise access applications. It says the system is particularly suited to dense urban areas, where additional capacity is required and regional authorities are sensitive to

aesthetics and equipment footprint.

CCS founder and CEO Steve Greaves said: "*Metnet* has been specifically designed to enable network performance excellence in high-traffic hotspots, and hotspots don't have more peak demand than at this exciting Formula 1 night race."

He added that the system's self-organising capability is the key to supporting the densification of small cell networks, and to enabling the evolution to 5G and the IoT.



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Telkom Indonesia looks to HAUD for security

Telkom Indonesia, which is said to be the world's seventh largest telco, will use mobile network security technology from HAUD to protect its 157 million subscribers from spam and fraudulent SMS traffic.

The agreement follows a successful trial in which HAUD deployed a bespoke firewall solution with 24/7 monitoring, and carried out an in-depth traffic audit of millions of text messages.

According to the Malta-based vendor, its mobile network firewall provides modular, 360° protection against SS7 security vulnerabilities, and effectively ring-fences networks from malicious messages. At the same time, it's claimed to prevent grey route traffic that bypasses network termination fees.

HAUD will also provide Telkom with A2P SMS monetisation services to create new sources of revenue and improve its subscriber experiences.

Through what's claimed to be a "pioneering" Revenue-as-a-Service approach, HAUD says it will manage the entire A2P monetisation process, from traffic identification and blocking, to redirection of traffic to monetisable channels, without requiring any initial investment from the operator.

"Revenue-as-a-Service is a new approach to helping operators to make the most of all possible income streams available to them," says Mårten Björkman, SVP Asia Pacific at HAUD. "The global A2P SMS market is worth billions but many operators are not equipped to claim their fair share and routinely lose out on large amounts of revenue due to the ongoing use of grey routes."

Asia is widely considered the biggest market globally for A2P SMS. Telkom Indonesia says that with hundreds of millions of messages sent across its network every day, ensuring spam and fraudulent SMS messages are blocked is vital.

DSA welcomes India's consultation on public Wi-Fi

The Dynamic Spectrum Alliance (DSA) has supported the Telecom Regulatory Authority of India (TRAI) on issuing a consultation paper on the proliferation of broadband through public Wi-Fi networks. It has now submitted recommendations for increasing the amount of license-exempt spectrum.

India currently uses Wi-Fi to connect over half of its users to the internet. With mobile devices set to dominate the bulk of future online traffic, which is set to rise four fold by 2020, ensuring Wi-Fi connections are secure and robust is therefore considered essential.

The DSA believes it is vital that TRAI advance policies that will make

additional license-exempt spectrum available. It says the regulator should do this both by designating bands for license-exempt use where available, and through intensive spectrum sharing between licensed and license-exempt users, where possible.

"The DSA is all about promoting and enabling spectrum sharing of all guises," says Professor H Nwana, executive director of the Dynamic Spectrum Alliance. "This means we prefer balancing more shared spectrum utilisation over exclusive utilisation, balancing static allocation with more dynamic allocation, and balancing licensed regulations with more unlicensed regulations."

So naturally, we support plans worldwide to open up more spectrum to unlicensed access from devices and unlicensed sharing."

Nwana called for TRAI to increase the amount of license-exempt spectrum available through dynamic spectrum sharing in segments of the 5GHz band, TV white space frequencies, high-band spectrum (71-76GHz and 81-86GHz), as well as assigning the lower part of 6GHz and the entire 57-71GHz range for license-exempt use.

"With these steps there will be enough spectrum to fully support TRAI's objective of expanding broadband through the proliferation of public Wi-Fi in India," he concluded.

Juvo launches mobile identity scoring

Founded to offer financial identities for millions of people who are credit worthy but often ignored by banks and other lending institutions, Juvo has launched its service with an initial reach of over 100 million users.

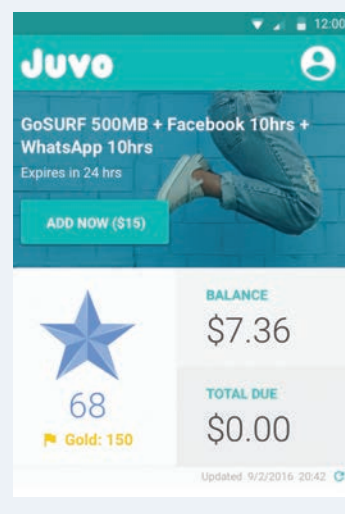
Headquartered in the US, Juvo partners with cellcos to provide a financial identity and mobile financial services to the 5.7 billion pre-paid mobile users around the world.

The company claims the proprietary algorithms and data science technology it uses analyse both subscriber and usage data, continuously and in real time, to generate 'identity scoring' that

unlocks essential access to credit and basic financial services for users. Juvo founder and CEO Steve Polsky reckons the often hard to reach pre-paid mobile user is now a potential customer for operators that have struggled to engage with this customer group.

In addition, Juvo's 'Identity Stack' is said to include intelligence and reporting tools that offer operators actionable analytics and insights to drive user engagement and growth.

On a mission to unlock the massive pre-paid market, Juvo offers mobile operators sight of previously invisible customers.



Mobile satellite services set up in Vietnam

Mobile satellite services operator Thuraya Telecommunications has signed an agreement to make its land and maritime handsets available to the Vietnam Posts and Telecommunications Group (VNPT).

VNPT operates VinaPhone, the second largest mobile network in Vietnam. As a result of the agreement with Thuraya, VNPT VinaPhone's coverage will expand to two-thirds of the world including 100 per cent coverage over Vietnam and its island territories. It's claimed the VinaPhone SIM will instantly deliver efficient

voice and SMS services across the region for the first time.

At the signing of the agreement in Hanoi in August, a VNPT spokesperson said: "The mobile satellite service marks a significant step for the VNPT VinaPhone mobile network, allowing it to cover all of Vietnam, thereby eliminating communication black spots."

VNPT will initially deliver its services using Thuraya's *XT-Lite* handsets and the *SF2500* maritime communication device for local consumers, government agencies and enterprise customers.

The vendor claims the equipment offers "robust and versatile" maritime communication solutions, and are also small and easy to use.

The *SF2500* maritime handset is aimed at consumers, government agencies and enterprise customers.



Yahsat and iDirect launch VNO satellite service

Yahsat and VT iDirect are working together to introduce VNO services across the existing footprint of *YahClick*, Yahsat's satellite broadband service.

Based on what's claimed to be the "industry changing" capability of VT iDirect's *Evolution* platform, Yahsat says the VNO offering will leverage the "high-speed and economical capacity" of *YahClick*'s Ka-band network.

It says partners will be able to buy bulk capacity which they can then fully manage and configure themselves to offer differentiated services. They will also be able to commission, control and monitor their own remote sites, while designing and configuring their end-to-end IP network.

The new service is targeted to meet the high QoS demands of corporate



The service partners across *YahClick*'s markets, along with the Yahsat and iDirect teams that are training them.

and government customers. Yahsat says partners are empowered to create private networks, offer higher uplink speeds, and address market needs such as cellular backhaul, rural telephony, distance learning, etc.


It says that as well as benefiting from high throughput capacity using its *Y1B* coverage area, partners will not be required to pay any capex or upfront costs in order to operate as a VNO.

Other advantages are that partners receive capacity either as simple Mbps or Msps (mega symbols per second). In addition, Yahsat says the service is supported by a "simple" pricing structure that covers all aspects of the offering, including the provision of VT iDirect line cards, round-the-clock support, teleport charges, access to high-speed internet backbone, as well as satellite capacity.

GSAT-18 in orbit

 Following a 24-hour delay because of unfavourable local weather conditions, Arianespace launched India's *GSAT-18* from Kourou on 5 October. Developed by the Indian Space Research Organisation (ISRO), the satellite has 12 transponders in Ku-band, another 24 in C-band, and has been designed to generate a capacity of more than 12Gbps for users from a single platform. With multi-spot beam coverage to provide telecoms services over the Indian mainland and nearby islands, *GSAT-18* will strengthen ISRO's current fleet of 14 operational satellites.

Telenor sole 4G bidder

 The Pakistan Telecommunication Authority (PTA) only received a single bid in its recent spectrum auction for next-generation mobile services. The authority was hoping to attract international as well as domestic operators. It said that in accordance with the timelines of the auction process, it held an information session with possible bidders in May. Telenor was the only firm to submit a bid by the deadline which expired on 1 June. It will pay USD395m for a 10MHz block of 850MHz, and joins China Mobile's subsidiary Zong as the only licensed 4G network provider in Pakistan.

StarHub promises enhanced customer experience with the help of Axiros

Singapore's StarHub has partnered with Axiros for device and service management of its residential broadband network.

The operator is using Axiros' *AXESS.ACS Auto Configuration Server* for open device management, and its *AXTRACT QoE/QoS* analytics platform. By empowering StarHub in this way, Axiros claims customer

satisfaction improves, and the company can expect an ROI with lower customer churn and higher value-added service offerings.

Shaun Rossiter, VP of sales for Axiros, Asia Pacific, reckons that one of the benefits of the Axiros/StarHub partnership is the ability for StarHub to combine all device types on the same platform.

He says: "As StarHub continues to roll out broadband services with advanced next-generation home gateways, it's great to know that they can utilise legacy devices and add new device types with ease in order for their customers to have an improved level of customer support regardless of device type using the Axiros platform."

GVTele to deliver intelligent networking in Bangladesh

Global Voice Telecom (GVTele) will use Cataleya's session border controller to deliver high performance intelligent networking to support its growing regional and global voice traffic.

GVTele is one of a just a few licensed international gateway (IGW) operators that is allowed to route incoming and outgoing calls to and from Bangladesh. It is said to be one of the country's largest IGW service providers, supporting more than 200 interconnect partners worldwide.

GVTele's international network

is built with POPs in London and Singapore connected via multiple links. Using Cataleya's *Orchid One* session border controller, it hopes to offer guaranteed QoS and QoE to differentiate its offering in Bangladesh and compete on performance. The vendor also claims *Orchid One*'s capacity of up to 100,000 sessions per 2RU will enable GV Tele to reduce its equipment footprint considerably and benefit from significant power savings.

Cataleya's CEO Jay Jayasimha believes Bangladesh has one of the

Cataleya CEO Jay Jayasimha says Bangladesh has a "vibrant and growing" international voice market.




largest diaspora populations in the world which makes for a "vibrant and growing" international voice market.

He adds: "Our next-gen session border controller will support the growth of GVTele and enable it to serve growing demand with high performance and intelligent networking. Quality at scale is critical in the voice market, and GVTele is benefiting from true end-to-end QoS and QoE that is ready to grow with its business."

Nepal set for 4G

 The Nepal Telecommunications Authority has reportedly accepted applications from Nepal Telecom and Ncell to launch 4G services. The operators want to reform the 1800MHz frequencies currently being used to provide 3G services and are able to do so now that the existing radio frequency policy has been amended. Smart Telecom also applied to launch LTE services but was rejected as it did not meet some preconditions.



Connecting a country

The skies over Myanmar are set to get busier as the satellite industry races to connect a country that, just a few short years ago, had very little telecoms infrastructure or services.

KBZ Gateway's Earth station is located in Bago, south central Myanmar. It operates one network for C-band services and another for Ku-band.

The last few months have seen a variety of deals signed to boost satellite-based services in Myanmar.

For instance in May, the country's Ministry of Transport and Communications (MOTC) announced that it will utilise services on two Intelsat satellites to advance the deployment of wireless communications infrastructure, and expand broadband access for businesses.

Under the multi-year, multi-transponder agreement, Intelsat said it will help to "significantly enhance" networks operated by both the government as well as other MNOs.

Speaking at the time, MOTC permanent secretary Khin Maung Thet claimed that the deal "further underscores" the government's commitment to building a more digitally inclusive society. He said: "We will leverage [Intelsat's] satellite solutions to extend 2G and 3G communications services beyond urban centres and ensure that all of our citizens have access to higher bandwidth, superior quality and more affordable mobile broadband connectivity."

The MOTC will use C-band satellite services on *Intelsat 902* located at 62°E, and Ku-band services on *Intelsat 906* at 64°E for VSAT network and cellular backhaul services. By 2018, the ministry will move to the new, high power services on the recently announced *Intelsat 39*, the replacement spacecraft for the 62°E orbital position.

According to Intelsat, by integrating satellite solutions into its own mobile networks, the government will be able to "dramatically increase" overall network bandwidth and reliability as it expands 2G and 3G services into Myanmar's more remote areas. Intelsat CEO Stephen Spengler said: "Our services will help enrich the lives of the communities it serves by improving medical and educational access, providing a lifeline during times

of crisis and enabling Myanmar to foster strong relationships within and outside of the country."

Satellite means business

Also in May, it was announced that Newtec's multiservice *Dialog* platform will be used to facilitate the launch of C-band enterprise services for Com & Com, a joint venture between the service provider Terabit and Newtec's certified business partner OSB.

Newtec said that with network congestion in Myanmar's cities, and optical fibre backbones mostly restricted to the centre of the country, satellite gives Com & Com a fast way to provide high-quality service connectivity in both urban and hard-to-reach areas.

The vendor will supply Com & Com with what's described as its "highly scalable" *4IF Dialog Hub*, supporting MF-TDMA as well as Newtec's *Mx-DMA* return link technology, and hundreds of satellite modems. The C-band service will initially serve corporate users, including SMEs, and banks. Com & Com will later expand the service to Ku-band and consumer broadband. Within two years, the partners expect to provide several hundred more VSAT terminals. Com & Com MD Theingi Lin said: "In Myanmar – where internet and television penetration is very low – satellite communication is the most cost-effective and fastest way to bridge the digital divide."

Local TV station and systems integrator Sky Net is also hoping to cash in on that promise. It will work with Gilat Satellite Networks (GSN) after winning the tender to provide a turnkey solution for satellite-based cellular backhaul for a prominent MNO. The operator has not been named and is one of four licensed cellcos in Myanmar collectively tasked with reaching 90 per cent of the country by 2020.

Meanwhile, Hughes has also been busy in the country deploying its *JUPITER* system.

In June, Myanmar VSAT service operator KBZ Gateway unveiled a new Earth station powered by the platform which will support high-performance data services for businesses and consumers throughout the country.

The station is located in Bago and includes two satellite networks that will connect all KBZ Group company sites countrywide. KBZ Gateway is also offering satellite broadband to enterprise customers, consumers and to cellular providers for backhaul capacity. The company estimates a potential to connect more than 6,000 sites over the next five years.

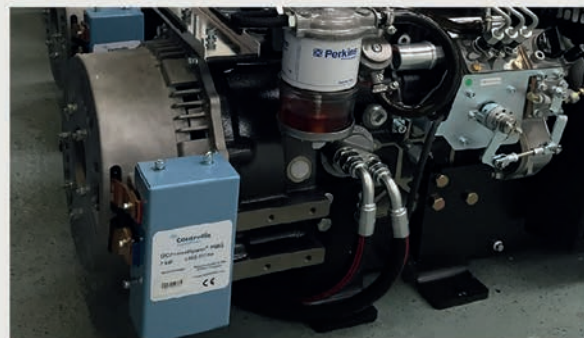
KBZ Gateway will build and operate two networks: one for C-band service and the other for Ku-band. The company said the implementation of *JUPITER* represents a "major step forward" in building a network infrastructure to support Myanmar's continued economic growth.

Hughes claims its system is one of the world's most widely used satellite internet platforms. It has been designed to enable operators to achieve the highest possible capacity and efficiency for any satellite broadband implementation, and is said to feature a processor that uses a multi-core architecture and enables 100Mbps of throughput on every terminal within the *JUPITER* family.

Meanwhile, SEANET (Southeast Asianet Technologies) is also using Hughes' platform for the delivery of a high-speed satellite internet service to business customers. The company recently launched its nationwide network and will utilise *JUPITER* to extend internet access in underserved areas where distance and geographical obstacles make connecting to terrestrial infrastructure difficult or impossible. Applications SEANET plans to support include high-speed broadband and narrowband data, VoIP, VPNs and cellular backhaul.



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Introducing satellite communications excellence

NSSLGlobal is an award-winning, independent service provider of satellite communications and IT support, committed to delivering high-quality voice and data services to customers anywhere in the world, regardless of location or terrain.

Our customers come from a wide range of sectors including: mining, media, maritime (commercial and super yacht), fishing, government, military, oil and gas, energy, offshore and financial sectors.

Because we wholly-own and control our own world-class VSAT network we're able to offer one of the broadest coverages and fastest download and upload speeds available. Via six teleports, 23 beams and 15 satellites our VSAT network covers 95% of the Earth's surface, including all of the world's major commercial shipping routes, mining areas, offshore oil rigs and fishing domains.

As well as our own network we also bring together best-in-class satellite solutions from leading providers such as Inmarsat, Thuraya and Iridium, to offer customers a full suite of options across C-, L-, Ka- and Ku-Band networks.

Long-heritage of customer service excellence

In business since 1969 we pride ourselves on delivering excellent customer service, whilst delivering off-the-shelf or bespoke products and packages to suit clients' bespoke needs.

In 2014 NSSLGlobal merged with the ESL Group to create a **satellite communications powerhouse** boasting extensive experience in the industry and a large infrastructure of offices, teleports, service centres and local resellers across all continents. As part of our on-going commitment to support customers at a regional level, we now have offices in Singapore as well as the UK, Germany, Denmark, Poland, the US and South Africa, all backed by 24/7 Network Operation Centres, which provide nonstop technical support for every customer, whether on land, at sea or in the air.

A presence in Asia

NSSLGlobal has had a local presence in Singapore since 2013 and we recently relocated to a larger office in the Toa Payoh region. This move underlines the importance of rapidly-growing Asian markets to our business. APAC has always been a region of major importance for the company, and we have been strongly engaged with a large number of long-term Asian customers for many years. In recent years much of our Asian customer base has undergone strong growth.

For example, Teekay, one of the world's largest marine energy transportation, storage and production companies has recently signed a \$4m VSAT upgrade and contract extension with NSSLGlobal. The new contract enhancement not only doubles the bandwidth speeds for both the onboard crew and operational network, but will also provide additional technical managed services to allow Teekay to be able to quickly and confidently roll out new fleet-wide applications. The upgrade is being rolled out across Teekay's fleet of conventional tankers, and LNG Carriers totalling 125 vessels. Although we service Teekay vessels on a global basis, the Singapore office has become an increasingly important asset for day-to-day support as Teekay's APAC fleet has grown.

Not just in Singapore, we are also seeing strong customer growth in Japan, China, Indonesia and the Philippines.

Maritime pedigree

Maritime is a hugely important market for NSSLGlobal in Asia. Asia already accounts for about 70 per cent of global container throughput handled by the world's top 30 container ports. Nine of the world's 10 busiest container ports are also in Asia.¹

VSAT IP@SEA is our dedicated maritime VSAT service (DVBS2-RCS2) offering fixed monthly fees and speeds of up to 40 Mbit/s to help guarantee a vessel's

ability to operate on a commercial level whilst adhering to MLC-2006 regulations for crew welfare.

In the maritime sector we have the scale, capabilities and expertise to support extremely complex and sophisticated high connectivity and bandwidth requirements. This can include the provision of connectivity to all ship systems and sub-systems or supporting customers with other growth applications such crew welfare, electronic charting and weather, remote IT services, and electronic port and customs documentation.

However, we also have entry-level packages like CC-LITE which are perfect for small-regional and inter-regional vessels (e.g. fishing, service and supply) that just have a basic email requirement and need to keep much tighter control of bandwidth and cost.

Earlier this year NSSLGlobal also acquired the majority shareholding in Marine Electronics Solutions Ltd a specialist in installation, maintenance, supply and development of communications and navigation products and solutions for the maritime, government, offshore renewables and oil & gas sectors. This led to the recent launch of Oceanic Dynamics, a new self-contained motion and impact monitoring system suited to offshore vessels that is designed to protect the longevity of offshore assets by monitoring and reporting vessel impact on structures, passenger comfort and safety and engine performance and reliability.

The one-stop-shop for satellite communications

All-in-all NSSLGlobal's unique and unrivalled blend of multi-sector experience, technical knowledge, true 24/7 technical support and a local in-country service engineering capability, means we truly can provide a "one stop shop" for any company looking for the best satellite communications products, packages and customer service in the industry.

¹ <http://www.todayonline.com/business/good-prospects-maritime-industry-asia>

India overtakes US to become second-largest internet market

India has overtaken the US to become the world's second-largest internet market. According to ITU data, India now has 333 million users and is second to China which has 721 million.

But in its latest *State of Broadband* published in mid-September, the UN Broadband Commission for Sustainable Development said that while internet access is approaching saturation in richer nations, connectivity is still not advancing fast enough to help bridge development gaps in areas like

education and health care for those in poorer parts of the world.

Worldwide, an estimated 3.9 billion people are not using the internet. The report revealed that just six nations together account for more than half of the total global population that is still offline because of the sheer size of their populations. It estimates that between them, China, India, Indonesia, Pakistan, Bangladesh and Nigeria account for 55 per cent of all unconnected people.

Among ITU member states in South Asia, Afghanistan has the lowest number of people using the internet – out of a population of 32,526,562*, only 8.26 per cent are online. Singapore has the highest figure of 82.10 per cent but its population is just 5,535,002*.

However, the commission remains optimistic about the potential of mobile broadband, with 165 countries globally now having deployed 4G high-speed mobile networks. It says that as smartphone penetration reaches

near-saturation in the US, Europe and mature markets in Asia, India and Indonesia in particular are expected to drive future growth. India also recently overtook the United States to become the world's second-largest smartphone market, with an estimated 260 million mobile broadband subscriptions.

According to the latest ITU figures, 3.5 billion people will be using the internet by the end of 2016, up from 3.2 billion last year.

*World Bank data.

VimpelCom and Dhahi Group complete Mobilink and Warid merger

VimpelCom plans to invest USD1bn in Pakistan over the next five years following the completion of the merger of Mobilink and Warid Telecom.

The deal was first announced in November 2015 (see *Wireless Business*, Q4 2015). Mobilink has now completed the acquisition of 100 per cent of Warid's shares, while the Dhahi Group shareholders have acquired 15 per cent of Mobilink.

VimpelCom CEO Jean-Yves Charlier said that as a result of the merger, 38 million Mobilink subscribers will be provided with 4G

while 12 million Warid customers will be provided with 3G. Around 1,500 Mobilink-Warid franchise shops will also be opened nationwide.

He added that now that the transaction is complete, Mobilink and Warid will benefit from a billion dollar investment programme to build one of "the largest and most ambitious" IT infrastructures in the industry.

VimpelCom claims the group's new digital systems will enable faster rollout of new local products and services, particularly in the areas of mobile entertainment, communications, the Internet of Things, and mobile financial services.

The operator also promised to expand services to remote areas.

Aamir Ibrahim, currently CCO and deputy CEO of Mobilink, has been appointed CEO of the merged company. Andrew Kemp, the current CFO of Mobilink, will also assume the role of CFO at Warid.

Spacecom and Luxembourg Space Telecommunication to merge

Spacecom, the operator of the AMOS satellites, has announced that it will merge with Luxembourg Space Telecommunication (LST), a Luxembourg company and subsidiary of Beijing Xinwei Technology Group.

Following the signing of the agreement in August, Spacecom said LST will acquire, by way of triangle reverse merger, the full share capital of the company for USD285m. It said the price reflected a premium of 41 per cent to Spacecom's average stock price during the past month.

The company added that the deal was "structured carefully" with safeguards to ensure that Spacecom's US business, including prospective procurement of US satellites, is and will not be affected. Under the terms of the deal, Spacecom's satellite fleet will remain owned and exclusively under the control of Spacecom in

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
19/6/16	Ericsson	Sweden	2Q16	SEK	54.1 (bn)	4.22 (bn)	0.48	Overall sales down by -11% YoY. Company will "intensify" activities to reduce cost of sales & adapt operations to a weaker mobile broadband market; further job losses feared.
27/7/16	Intelsat	US	2Q16	USD	542.0	403.6	0.98	Compared to 2Q15, Network Services revenue decreased 16%, Media revenue is down 5%, & Government revenues declined 2%. CEO Spengler said results are "consistent" with expectation for 2016.
29/7/16	Eutelsat	France	FY16	EUR	1,529.0	1,164.6	1.10	Revenues up 0.2% on like-for-like basis – 64% of this is from video applications which increased 2.3% to €943.6m.
4/8/16	Motorola Solutions	US	2Q16	USD	1,430 (bn)	NA	0.61	Sales increased 5%, including \$146m in sales associated with the acquisition of Airwave in the UK. Continues to expect revenue to increase 5 to 7% & non-GAAP EPS from continuing operations in the range of \$4.45 to \$4.65 per share.
4/8/16	VimpelCom	Netherlands	1H16	USD	2,156	795	3.48	Total revenue declined 16% YoY; organically stable with growth in mobile data revenue of 26% YoY, & strong performance in Pakistan & Ukraine offset by Algeria weakness. Purchase of Warid Telecom in Pakistan completed on 1 July.
4/8/16	Sierra Wireless	Canada	2Q16	USD	156.2	12.1	0.20	Earnings declined 1.1% compared to \$158m for 2Q15. Completed acquisition of fleet management & asset tracking specialist GenX on 3 Aug for total cash consideration of \$7.8m.

Israel, with satellites and their traffic operated exclusively from the country. All export control safeguards required by the US Government are in place.

Spacecom was also keen to point out that the Chinese Government will have no role in the company. It said Beijing Xinwei is a publicly traded company in the private sector, and that the merger represents a corporate investment, not an acquisition of technology or operations.

The completion of the merger is subject to shareholder and regulatory approvals, and the avoidance of specific unfavourable material changes in Spacecom's business.

The deal was also dependent on the successful launch of *AMOS 6* and the completion of its in-orbit tests. However, this did not go ahead as planned on 1 September, as the SpaceX *Falcon 9* rocket that was due to carry the satellite into orbit exploded on lift-off. Despite this, a Spacecom spokesperson says there has been no indication of LST abandoning the deal. The two companies are now working together to "repair the agreement" and adapt to the "new situation".

Vestberg goes as Ericsson reports dismal second quarter in 2016

Hans Vestberg has stepped down as Ericsson's president and CEO with immediate effect. His departure was announced on 27 July and came amidst shareholders reportedly calling for him to go following poor results for the second quarter of this year.

Vestberg leaves Ericsson after 28 years, the last seven of which saw him at the company's helm. EVP and CFO Jan Frykhammar will replace him until a successor is found, while Carl Mellander has been appointed acting CFO.

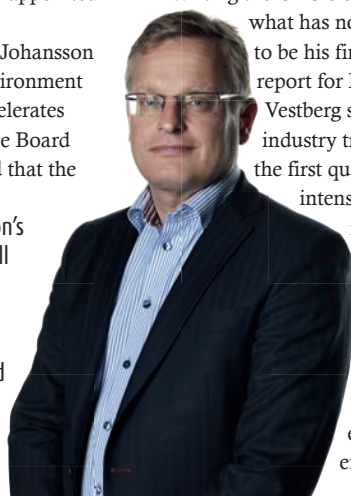
Board chairman Leif Johansson said: "In the current environment and as the company accelerates its strategy execution, the Board of Directors has decided that the

Jan Frykhammar – Ericsson's current EVP and CFO – will take over as CEO until a successor to Vestberg is found. Frykhammar has apparently told the board that he is "not aspiring" to permanently take on the role.

time is right for a new leader to drive the next phase in Ericsson's development."

Just a week before announcing Vestberg's departure, Ericsson revealed its 2Q16 figures (*see company results table, p13*) and reported an 11 per cent drop in YoY sales. It said further actions have now been initiated as part of a cost and efficiency programme which targets a new annual run rate of operating expenses (excluding restructuring charges) of SEK53bn in the second half of 2017.

Writing the CEO's comments in what has now turned out to be his final earnings report for Ericsson, Vestberg said: "Negative industry trends from the first quarter have intensified, impacting demand for mobile broadband, especially in markets with a weak macro-economic environment."



Wireless use in industrial IoT growing

The installed base of wireless Internet of Things devices in industrial automation reached 14.3 million in 2015, according to research by Berg Insight.

The M2M/IoT analyst firm forecasts that the number of wireless IoT devices in automation networks will grow at a CAGR of 27.7 per cent to reach 62 million by 2021.

Berg says there is a wide range of wireless technologies used in industrial automation with different characteristics and use cases. Wi-Fi and Bluetooth are the most widespread technologies in factory automation, while cellular connectivity is typically used for remote monitoring and backhaul communication between plants. The emerging area of Low Power Wide Area Networking (LPWAN) is also seen as a promising alternative in remote monitoring applications.

The firm goes on to say that the increasing popularity of Ethernet-based networks in factory automation is one of the key drivers for the use of Wi-Fi in such applications. It adds that 802.15.4-based standards such as WirelessHART and ISA100.11a are

INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
26/5/16	Flexenclosure	European Investment Bank	Finance deal	EUR7.5m	Loan will support expansion of Flexenclosure's R&D activities in intelligent power management systems and prefabricated modular data centres. Swedish firm's key markets include sub-Saharan Africa, Latin America, & central & South East Asia.
14/6/17	Cyan	Connode	Company	NA	Sweden-based Connode specialises in wireless communication products for IoT. Earlier this year it partnered with Reliance Energy to build a smart sustainable city network pilot in Mumbai. Cyan says acquisition will accelerate its product roadmap with the addition of IPv6 LPWAN as well as expand its geographic coverage.
15/6/16	Apollo Towers Myanmar	Overseas Private Investment Corp.	Loan	USD250m	OPIC is the U.S. government's development finance institution, & has now started the initial disbursement of a \$250m loan to Apollo Towers. The company has built around 1,800 towers since 2014, & plans to build over 2,000 more during its next phase of development.
13/6/16	Microsoft	LinkedIn	Company	USD26.2bn	Microsoft believes acquisition of "world's largest & most valuable" professional network will complement its line-up of enterprise products & services.
4/7/16	SES	O3b Networks	Shares	USD730m	Following the increasing of its shareholding earlier this year, SES has now received all regulatory approvals to acquire the remaining shares and warrants of O3b. Its fully diluted ownership has now increased from 49.1% to 100%.
8/8/16	SpeedCast International	Eutelsat	WINS Limited	EUR60m	SpeedCast says acquisition of Eutelsat's 70 per cent stake in WINS gives it a "strong local presence in Germany, a major maritime market, as well as expertise in the cruise industry in Europe".
18/8/16	Singtel	Temasek	Shares in InTouch & Bharti Telecom	USD2.47bn	Will acquire 21% of Temasek's shares in InTouch Holdings & 7.39% of its shares in Bharti Telecom. InTouch is biggest shareholder in Thailand's largest telco, Advanced Info Services (AIS). "Thailand, India and Africa continue to be attractive, high-growth markets for us," said Singtel CEO Chua Sock Koong.
22/8/16	InfoVista	Ascom	TEMS	USD45m	TEMS is claimed to be the most widely used mobile network testing, monitoring & optimisation platform. InfoVista, which is now owned by the private equity investment firm Apax Partners, hopes the acquisition will give it the lead in the network performance orchestration software market.
14/9/16	Amdocs	Pontis; Vindicia; & Brite:Bill	Companies	USD260m	Amdocs says the three similarly priced companies were acquired for a combined cash amount of around \$260m. Israeli-based Pontis offers "contextual digital engagement solutions"; US firm Vindicia provides SaaS; while Brite-Bill is a BSS specialist from Ireland.

major contenders at the field level in process automation networks.

According to the research, Emerson, Honeywell, GE and Yokogawa are leading vendors of 802.15.4 devices in industrial automation. Siemens, Cisco, Belden, Moxa, Schneider Electric and Eaton are major vendors of Wi-Fi devices, while Eaton, GE and Sierra Wireless are important vendors of cellular devices for industrial automation applications.

Huawei to start smartphone manufacturing in India

Huawei has announced that it will begin making smartphones in India in collaboration with electronics firm, Flex India, in October.

The Flex manufacturing plant in Chennai will manufacture one of Huawei's *Honor* smartphones models, with three million units planned for the end of 2017.

The vendor says it will also strengthen its after-sales services in India with over 200 service centres, of which more than 30 will exclusively

deal with Huawei products. Underlining what's claimed to be its customer-centric approach, the company's consumer business group will also expand its distribution network by partnering with more than 50,000 retail outlets by the end of 2016. Huawei says this retail network will add to its existing 350+ distributors in India to create a "comprehensive", nationwide distribution system.

Jay Chen, CEO, Huawei India said, "We have been present in India for the last 16 years, and as part of our India focus, we have been consistently expanding our footprint in the market."

New R&D for Riverbed in Bangalore

US-based WAN optimisation specialist Riverbed Technology has opened a global research and development facility in India.

The firm says it plans to expand its engineering team in the region three-fold over the next few years as part of its effort to accelerate the delivery of next-generation cloud networking and application performance solutions

worldwide. According to Riverbed, the new Bangalore centre will be its largest R&D facility outside the US, and will focus on solving some of the "toughest challenges" businesses face in the digital era. It will also serve as the new headquarters for the company's sales and operations in India.

Jerry M. Kennelly, chairman and CEO of Riverbed Technology, said: "At our core, we are an engineering company that builds its own technology, and India is a central player in our strategy of global shared development."

"The availability of world-class talent, advanced infrastructure and proximity to other fast-growing emerging markets of the world are key reasons behind this. The decision to open the new facility in Bangalore reinforces India as a global R&D hub for Riverbed – one that will play a vital role in the future of the company."

Kartik Subbanna, vice president of engineering, will lead the new facility in Bangalore. He will report to US-based Vineet Abraham, Riverbed's SVP of engineering.

GSMA launches innovation fund

The GSM Association has launched its Ecosystem Accelerator Innovation Fund to help identify innovations with the greatest potential for growth, and provide best practices for stakeholders on the ways in which they can use mobile to drive socio-economic impact.

The fund is open to new companies from and operating in Africa, as well as selected countries in Asia. The GSMA says it will provide financing, mobile-focused mentoring, and technical assistance to selected start-ups, and establish partnerships between them and operators to increase the reach of innovative mobile services.

The fund will run several rounds between 2016 and 2020, with each having specific areas of focus. The first round will disburse around GBP2m. As well as being supported by the GSMA and its members, the initiative is backed by the UK Department for International Development (DFID).

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
4/5/15	Chuck Robbins	Cisco	CEO (as from July 2015)	Cisco	SVP, worldwide operations
5/5/15	John Chambers	Cisco	Executive chairman (as from July 2015)	Cisco	CEO
9/5/16	Obafemi Banigbe	Kirusa	Advisory board member	Silver Rock Technology Services	Managing partner
7/6/16	Marcio Saito	Opengear	CTO	Cyclades	CTO
20/6/16	Rob Shuter	MTN Group	President & CEO	Vodafone Group	CEO of European cluster
23/6/16	Abdelkrim Benamar	Astellia	CEO	Astellia	COO
23/6/16	Christian Queffelec	Astellia	Chairman	Astellia	CEO
23/6/16	Nick Avill	Simoco Group	Business development director, EMEA utilities	Bender UK	UK industrial sales manager
23/6/16	Connor Smyth	Simoco Group	Business development manager, EMEA utilities	Ultra Wood & Douglas	Sales & marketing account manager
27/6/16	Paul Hodges	Globetouch	MD for Asia Pacific	Smartfren Indonesia	CEO
30/6/16	Jerome Fink	Advantech Wireless	Director of sales in Indonesia	Resqtec Zumro	APAC sales director
4/7/16	Christian Leicher	Rohde & Schwarz	President & CEO	Rohde & Schwarz	Executive board member
12/7/16	Gary Aitkenhead	Sapura	VP devices	Motorola	VP of global managed services
12/7/16	Michelle Lamprecht	Sapura	VP marketing	The MathWorks	Marketing manager Northern Europe
29/7/16	Vivek Badrinath	Vodafone Group	Chief executive for Africa, Middle East, Asia-Pacific	AccorHotels	Deputy chief executive
4/8/16	Kjell Morten Johnsen	VimpelCom	Head of major markets	Telenor	Head of Europe
8/8/16	David Orloff	Small Cell Forum	Chair	-	The director of RAN product introduction at AT&T replaces outgoing chair Alan Law
29/9/16	Paul Brown-Kenyon	-	-	MEASAT	Stepped down as CEO. Simon Cathcart appointed interim CEO

Cambium platform promises fibre-like throughput

The *PMP 450m* is the first product to feature Cambium Networks' *cnMedusa* technology. This has been developed

MANUFACTURER:
Cambium Networks

PRODUCT: PMP 450m

MORE INFORMATION:
www.cambiumnetworks.com

to enable operators to offer what's claimed to be 5G-like speeds surpassing DSL and cable while offering throughput comparable to fibre.

According to the firm, *cnMedusa* is the first commercially available Massive Multi-user (MU) MIMO platform for fixed wireless broadband. It says the technology's 14x14 integrated antenna array exceeds both 802.11AC Wave 2 and LTE-A planned implementation of

8x8, and yields the ability to support up to seven simultaneous carrier chains. Cambium adds that the integrated sector antenna cuts capex as well as opex in installation and recurring tower fees.

It goes on to say that the *cnMedusa*-enabled *PMP 450m* offers "unprecedented" spectral efficiency of more than 20bps/Hz, and more than 40bps/Hz when deployed in frequency re-use configurations.



Cambium also says the platform offers a three- to four-fold increase in network capacity, with more than 400Mbps in a 20MHz channel.

The new *PMP 450m* works with existing *PMP 450* subscriber modules and only requires changing out the access point. Cambium adds that the entire system can be managed via a single pane of glass in the cloud.

MicroPoP offers fast wireless broadband to urban areas

Mimosa reckons its *Micro Point-of-Presence (MicroPoP)* network architecture enables service providers to deliver gigabit wireless broadband and achieve the same

MANUFACTURER: Mimosa

PRODUCT: MicroPoP

MORE INFORMATION:
<http://mimosa.co>

speeds as fibre for a fraction of the cost. The system combines Mimosa's new *A5* access point and the *C5* client device.

With its "unique" quad-sector antennas and massive MIMO technology, the compact *A5* is claimed to be the industry's fastest multipoint solution purpose-built for high-density deployments, and offers more than 1Gbps of aggregate capacity. It can be deployed in a central point within

a neighbourhood to provide wireless broadband connections to subscribers within 500 metres.

Both the *A5* and the *C5* feature GPS sync-enabled TDMA. This ensures that each client device precisely receives and transmits under the AP's timing control. Mimosa says this also eliminates the possibility of interference from other *A5*s in the vicinity.

The *C5* endpoint is also MU-MIMO capable which means that



multiple clients on the same AP can be coordinated to simultaneously share spectrum, thus improving scaling and spectral efficiency.

With protection from harsh environmental conditions and

a wide-range of mounting options, Mimosa adds that the units are suitable for "any deployment situation".



EtherHaul-500 "ideal" for congested 5GHz networks

Siklu, which specialises in millimetre wave wireless solutions, has launched what it describes as an "affordable" V-band radio for interference-free connectivity on the street. Operating in the 60GHz band, the new *EtherHaul-500* is claimed to be "perfect" for upgrading congested 5GHz networks.

The radio is designed to provide 200Mbps of real time connectivity. It utilises the ample 9GHz-wide V-Band spectrum with 11 non-overlapping full-capacity channels, which are also user-selectable. According to Siklu, the 60GHz band is characterised



by abundant license-free spectrum, minimal reflections, and narrow beamwidth. It says all this enables dense link deployment.

The spectrum also provides predictable performance as it experiences no beam interference. The firm says this is an advantage for mission-critical environments, such as transmitting data from HD/4K video surveillance cameras and other safe city sensors.

MANUFACTURER: Siklu

PRODUCT: EtherHaul-500

MORE INFORMATION:
www.siklu.com

Planning tool saves time and money on rollouts

Ranplan has released a new version of its all-in-one planning, optimisation and simulation tool for indoor and outdoor radio networks.

iBuildNet 3.1 adds a range of new features including carrier aggregation, HSPA+, enhanced Wi-Fi planning capabilities, Smart CAD functions, and support for LTE-A key standards such as MU-MIMO and CoMP.

The enhanced tool is said to allow users to perform cross-system design and simulation with accurate modelling of coverage, traffic steering and handover between LTE and Wi-Fi systems.

According to Ranplan, this means indoor and outdoor Wi-Fi and cellular networks can be planned in co-ordination, reducing the time and cost of deployment and ensuring support for future heterogeneous technologies and standards.

The Smart CAD features include automatic extraction of walls, doors, windows and floors from complex CAD files to create more accurate building models. It's claimed this new capability alone can reduce the time it takes to model the building environment by more than 50 per cent.

iBuildNet's material database has also been enhanced to enable the design of networks operating in spectrum up to 6GHz. And with the advanced *Wireless Network Simulator*, engineers can now plan a user-centric model rather than a cell-centric one.

MANUFACTURER: Ranplan

PRODUCT: iBuildNet 3.1

MORE INFORMATION:
www.ranplan.co.uk

DMR simulcast system needs just one pair of frequencies

Hytera says its latest DMR solution offers a cost-effective option for suppliers, local public transport networks and municipalities to modernise their radio systems.

The *DS-6310 Simulcast* system has been developed using the DMR Tier II standard. It consists of a mobile switching office (MSO), base station

(pictured), dispatch system, a central network management system, service terminals and bearer network. Hytera says one MSO supports up to 100 base stations or 200 carriers, while a single DMR simulcast base station can support up to two carriers.

The company says a simulcast technique means that only a single pair of frequencies is needed (one for TX and one for RX) regardless of the number of base stations in the network. The DMR standard's two-slot TDMA technique supports two simultaneous communications on a single 12.5kHz channel which makes it possible to hold two conversations at the same time on a single frequency.



The platform's IP-based architecture is said to enable flexible networking. Multiple transmission links can be used between base stations and the MSO, such as IP, E1, microwave, wireless bridge, etc. Standard SIP and RTP are used to interconnect with other systems such as those used for PSTN and DMR trunking.

MANUFACTURER: Hytera

PRODUCT:
DS-6310 Simulcast

MORE INFORMATION:
www.hytera.com

Proxim launches long-range PTP link

Proxim Wireless has developed a long-range version of its carrier class *Tsunami QuickBridge* backhaul product.

The new *Tsunami QB-10150-LKL* features a 28dBi high gain integrated antenna that is claimed to allow links

in excess of 35km to be deployed. Proxim adds that compared to rival products with lower antenna gain, shorter range connections will also benefit from the *QB-10150-LKL*'s higher modulation rates and resulting higher data throughput.

The new version continues to support all the key features of the company's *QB 10100* series. This includes: high capacity usable throughput of 650Mbps; the ability for customers to select a wide frequency range from 5.15GHz to 5.85GHz in a single model; and *WORP*, Proxim's software that allows multiple traffic streams with varying



QoS needs to be bundled into one link.

In addition, the *QB-10150-LKL* supports IEEE 1588 pass through and Jumbo Frames, which are common carrier requirements.

Like all *Tsunami* radio products, the device also uses *Proxim ClearConnect* which helps it to withstand all but the most hostile RF environments. The *QB-10150-LKL* can operate in temperature ranges from -40°C to +60°C, and is contained in an IP67 rated enclosure.

MANUFACTURER:
Proxim Wireless

PRODUCT:
Tsunami QB-10150-LKL

MORE INFORMATION:
www.proxim.com

RFS introduces next-gen combiner range

Radio Frequency Systems (RFS) has enhanced its range of *ShareLite* combiners. The new models support additional wideband frequencies and include features such as DC sensing-AISG bypass and compatibility with the 4.3-10 standard.

RFS reckons its combiners are

"ideal" tools for any feeder or antenna sharing solution and help wireless operators adapt their infrastructure for 4G technologies. It says the combiners are compact and lightweight for easy handling, and their rugged design allows for outdoor use and increases product longevity.

According to the firm, automatic DC sensing and AISG bypass bring increased flexibility to site installations. It says they allow combiners to automatically adjust to site requirements and route DC and control signals through the antenna



line system as appropriate, thereby ensuring the right bypass for any installation.

RFS adds that the latest models in its *ShareLite* portfolio have extremely low insertion loss and a high level of rejection between bands for maximised performance. They

also accommodate many new frequencies as well as combined ones.

The entire range is available with the vendor's 4.3-10-style connectors, allowing operators to achieve the highest performance with the new interface standard.

MANUFACTURER:
Radio Frequency Systems

PRODUCT: ShareLite

MORE INFORMATION:
www.rfsworld.com

ALSO LOOK OUT FOR

Qualcomm unveils 5G sub-6GHz prototype system

Qualcomm Technologies has developed a 5G 'New Radio' (NR) prototype system and trial platform that operates in the sub-6GHz bands.

The company says the aim is to create a unified and more capable 5G air interface. It says designs implemented on its prototype system will be used to drive 3GPP standardisation for a new, OFDM-based 5G NR air interface.

The system will closely track 3GPP progress to help achieve timely 5G NR trials with operators, infrastructure vendors and other industry players, as well as future 5G NR commercial network launches.

The platform itself consists of both a base station and user equipment, serving as a testbed for verifying 5G NR capabilities. Qualcomm says it supports wide RF bandwidths over 100MHz that are capable of delivering multi-gigabit per second data rates.

It also supports a new integrated subframe design for what's claimed to be "significantly" lower over-the-air latency than what is possible in today's LTE network.

5G will make the best use of a wide range of spectrum and, according to Qualcomm, utilising frequencies below 6GHz is a critical part of allowing for flexible deployments with ubiquitous coverage and a many use cases.

The firm says the prototype system continues the development and testing of its 5G designs which are contributing to 5G NR 3GPP standardisation. The 3GPP 5G NR study item has begun as part of Release 14 and will feed into Release 15 work items.

The prototype adds to Qualcomm's existing 5G mmWave prototype system. This operates at 28GHz and is said to be capable of "robust" mobile broadband communications in non-line-of-sight environments, utilising advanced beamforming and beam-steering techniques.



The beneficiaries of Mobilink's *JazzCash* mobile banking system can collect their funds from any branch of Allied Bank in addition to 60,000 *JazzCash* agent locations throughout Pakistan.

Financial service providers across South Asia are digitising services to counter growing competition, as RICHARD HURST discovers.

Many of the region's banks and financial institutions are using technology to enhance services, secure new business, and grow their existing customer bases.

In addition, competition throughout South Asia has increased further due to the emergence of fintech and new online only banks. As a result, incumbents are looking at fresh avenues where they can digitise and expand their customer service capabilities to compete with the new entrants. And they're after innovations beyond mere mobile and online banking services to offer value and convenience to their corporate and retail customers.

For instance, India's Kotak Mahindra Bank (KMB) has launched *Kotak Now*, a digital account opening process using mobile devices. The service is entirely paperless and is completed without

any need of physical interaction or biometric verification. The end-to-end digital system includes verification of customer documents and signature via a video call with the bank.

According to KMB, the account opening process is simple and takes only a few minutes. Once the *Kotak Now* app is downloaded, prospective customers can upload documents (identity card or passport), and an image of their signature. After entering a few personal details, a customer relationship number and account number is generated. The app automatically selects a branch closest to the customer's address for correspondence.

The bank says its app is in sync with the Government's vision of a 'Digital India'. It claims to have played a pioneering role in the country's

digital banking space and says *Kotak Now* is just one of several innovative digital initiatives. For example in March 2014, it launched *Jifi*, describing it as the first social bank account that combines the power of social media with conventional banking. KMB says it was also the first bank in the world to offer *Hashtag Banking*, enabling customers to bank via Twitter. This was followed by *Kaypay*, the world's first bank agnostic instant funds transfer platform through Facebook, and then *Kotak Bharat*, a multilingual mobile banking app which requires no internet connectivity.

Kotak Now was developed using patented and secure technology from Germany-based WebID Solutions. Currently, the app enables customers to open a *Jifi* account but KMB says other savings account variants will be introduced in phases.

Partnering with MNOs to expand reach

With a network of more than 1,050 branches, Allied Bank Ltd. (ABL) is the fourth-largest private sector commercial bank in Pakistan. Under a partnership with Mobilink, customers of ABL and Mobilink Microfinance Bank can now use the *JazzCash* mobile money system for domestic remittances.

ABL says its customers can initiate domestic remittance transactions at any branch or by using a digital banking channel, while the beneficiaries of *JazzCash* can collect their funds from any branch in addition to 60,000 *JazzCash* agent locations throughout Pakistan.

For Allied Bank, the opportunity for growth revolves around being able to move to a branchless banking service. It adds that apart from improving access to financial services for unbanked segments of society, the partnership with Mobilink will establish a straight through processing of funds from already banked customers to unbanked groups. Meanwhile, Mobilink says that working with ABL supports its ambitions to build sustainable bridges between the unbanked and banked population across Pakistan's communities.

Allied Bank has also used mobile technology to allow customers to receive fresh bank notes. The move follows demand generated in 2015 during the Eid-ul-Fitr festival where it is customary for elders to give gifts of money to younger family members. Many banknotes in Pakistan have seen much better days, and so by using ABL's service, customers can send an SMS to a short code destination to a desired branch. They then receive a text reply containing a redemption code and branch address to obtain fresh notes.

Staying in Pakistan, Bank Alfalah has teamed-up with Careem as part of an overall effort to mobilise digital banking services and customer convenience in the country.

Careem offers online car booking services for its customers in cities across Pakistan, including Karachi, Lahore and Islamabad. With only a few clicks on the app, users can summon a car from the comfort of their homes or offices. The company has partnered with Bank Alfalah which offers a 25 per cent discount to its credit card holders who use the car service.

Careem is regarded as the fastest-growing car booking platform in the region. With Bank Alfalah also expanding its footprint across the country, more customers are expected to be able to benefit from the offer.



Allied Bank and Mobilink said their partnership will help promote financial inclusion in Pakistan.



With the goal of increasing women's contributions to Afghanistan's development, USAID's *Promote* programme aims to boost female participation in the economy, increase the number of women in decision-making positions within the Afghan government, and help women gain business and management skills. PHOTO: USAID

M-banking revolutionises Afghan economy

With more than 1.3 million registered users and more than USD6m transactions transferred each month, *M-Paisa* is said to be the largest m-commerce provider in Afghanistan and plays a vital role in the country's financial infrastructure.

Since mobile operator Roshan launched the mobile payment system in the country in 2008, it has expanded to provide a wide range of services and remittance options, including merchant and bill payments as well as humanitarian payments from national and international donor organisations. *M-Paisa* is said to currently have more than 100,000 active subscribers.

"When we launched *M-Paisa*, we wanted to bring in the latest technology to foster financial inclusion and to provide Afghans with a solution that supports economic development," said Karim Khoja, CEO, Roshan Telecom. "We are now able to take that to the next level and bring access to financial services and banking. *M-Paisa* provides the most transparent and effective payment options for businesses, organisations and government agencies to disburse compensation to recipients. We are planning to further expand and grow *M-Paisa* through similar partnerships."

According to Roshan, one of the most successful applications used by its *M-Paisa* customers is to pay salaries in a safe, transparent, and more efficient way. It says there are currently over 40 companies and organisations nationwide that are using the service to pay their employees.

For example earlier this year in July, the operator was awarded the contract to distribute stipend payments to 9,500 female interns of the *Promote-Women in Economy (WIE)* programme which is funded by the US Agency for International Aid. Globally, *Promote* is USAID's

largest women's empowerment programme, and its aim in Afghanistan is to advance opportunities for local women who can become political, private sector and civil society leaders. Building upon existing and previous programmes for women and girls, the five-year initiative targets the education, promotion and training of a new generation of Afghan women aged 18-30.

Another recently added feature to *M-Paisa* is electricity bill payment. In 2015, Roshan announced that it had teamed up with Da Afghanistan Breshna Sherkat (DABS) which operates and manages electric power generation, transmission and distribution in major cities throughout Afghanistan. The partnership will enable consumers to pay their electricity bills using *M-Paisa*. The initiative has started with a pilot programme for the approximately 320,000 customers in Kabul and will then expand to other provinces including Herat and Kandahar. It's claimed the service will save time and money for users by enabling them to pay their bills directly via their mobile phones.

Additionally, the *M-Paisa* system has now been upgraded to enable the integration of *M-Paisa* and



M-Paisa now has more than 100,000 active subscribers across Afghanistan. Roshan says when it launched the system in 2008, its aim was to provide people with a solution that supports economic development.

bank accounts, which means customers are also able to transfer money directly from their banks to DABS using their phones.

The integration began in 2014 when Roshan and the Afghan United Bank (AUB) launched a mobile banking service. It allows customers to transfer money between their *M-Paisa* and AUB accounts, check balances, withdraw cash and conduct all financial transactions securely via a mobile.

Speaking at the time, Khoja said working in partnership with AUB on the launch of the *M-Paisa Mobile Banking Service* is part of Roshan's vision to support the long-term development and sustainable growth of financial infrastructure in Afghanistan.

Further east across South Asia, ABA Bank launched Cambodia's first full-scale banking app in 2015. It has reported a massive growth in the number of users and has responded by reducing fees for mobile remittances in a bid to make the service more attractive to more people.

ABA Mobile is said to be a completely secure service since all the transactions are encoded and access to the application is protected with two-step authorisation. The app has all the features of ABA's internet banking service and allows users to monitor their accounts and card transactions, transfer money between personal accounts as well as those held by other ABA customers, pay bills for various service providers, and more.

Among the features, the app is said to offer the first account-free banking service. Through *ECash*, customers can let anyone who is a non-ABA customer to withdraw cash from any ABA ATM without using a card. The recipient only needs to enter the security code that was provided by the customers on the ATM screen.

Carrying the cashless

Axis Bank teamed-up with the Bengaluru Metropolitan Transport Corporation (BMTc) to launch the *Axis Bank BMTc Smart Card*, claimed to be India's first ever open loop EMV contactless smart card. The aim is to make travel by bus a convenient and hassle-free experience for daily commuters in Bengaluru. The initiative has the support of Ministry of Urban Development and has been designed to address the need for a common mobility card.

The pre-paid transport card is integrated to the bank's single wallet which not only allows for cashless commuting but also supports banking functions and is said to "enhance" the consumers mobile shopping experience.

Axis Bank partnered with the National Payments Corporation of India for developing the transit EMV contactless specification on interoperable open standards. These specifications can be used by any other transit operator, such as buses and taxis, by incorporating them into their existing fare collection systems. This will then make it more convenient for commuters as it would allow them to use the same card for purchasing tickets/ passes and for other daily purchases.

The partners believe the aim of technology should be to make life simpler for the citizen.

They say that transit agencies across the globe have been moving away from cash-based fare collection systems to contactless smart card-based systems. As a result, the *Axis Bank BMTc Smart Card* is said to be the next step towards building an intelligent transport system in Bangalore.

The Bank of Baroda (BoB) has used network technologies as the foundation of its financial literacy programme.

The Indian bank defines financial literacy as the ability to understand how money works in day-to-day functions, and how someone manages it. More specifically, it refers to the set of skills and knowledge that allows an individual to make informed and effective decisions with all of their financial resources.

BoB has set up Financial Literacy Centres (FLCs) with the following objectives:

- ❖ To facilitate financial inclusion through provision of two essentials, i.e. literacy and easy access
- ❖ To disseminate information regarding the central bank and general banking concepts to various target groups, including schools and college students, women, rural and urban poor, defence personnel and senior citizens
- ❖ For effective use of financial services by consumers

The FLCs are linked to lecturers and learning material via VSAT satellite links. The bank opted to use VSAT services based on the ability to offer coverage in the more rural remote areas where the programme was being rolled out. BoB has already deployed VSAT when rolling out ATMs across the country, and the existing services and network topology dovetailed with the objectives of its financial literacy programme.

The initiative is viewed as not just a social commitment, but a more important means of bringing about socio-economic development across rural India, thereby allowing banks to tap into the opportunities in the lower income brackets through ICT-based delivery channels.

BoB has rolled out 49 FLCs and 2,898 outdoor

training programmes. As a result, it has reduced its zero balance accounts from 47 per cent in 2015 to 16 per cent in the first quarter of the 2017 financial year.

The key elements driving the bank's 'Financial Inclusion Vision' included: ICT-based business correspondents; kiosks; mobile vans; and physical branches. There are five points that are said to make the programme innovative.

Firstly, fully technology-based banking modules have been introduced to cover unbanked areas. Secondly, BoB has specifically designed financial products to suit the needs of its targeted segment. Thirdly, online banking services are available in the villages on a real-time basis. Fourthly, the entire project is monitored at all levels, such as branch on daily basis, region, zones and corporate office on a fortnightly basis, and management on a monthly and quarterly basis. Finally, customers can use any delivery channel of choice, such as a business correspondent, ATM, micro-ATM, mobile banking, internet banking or branch.

Also in India, the South Indian Bank (SIB) has used ICT to better serve its retail customers via a couple of key new services. This includes the *Missed Call E-Mail* OTP facility. It has been implemented for sending a one-time password (OTP) for online banking to a customer's registered email address.

SIB usually issues an OTP via SMS. But in the event of a delay or the online customer not receiving this, he or she can ask for the OTP to be resent to their email address by giving a missed call from their mobile to a designated phone number issued by the bank.

The bank claims its service has enabled it to seamlessly serve customers and ensure that their online banking experience remains positive.

For the second new service, SIB has partnered with the India Railway Catering and Tourism Corporation (IRCTC). Online banking customers can now use a booking facility through the internet banking service which enables them to book and pay for train tickets as well as other services on offer from the IRCTC. ■



Axis Bank and the Bengaluru Metropolitan Transport Corporation reckon their contactless payment system on board buses represents the next step towards building an intelligent transport system in Bangalore.

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While solar power represents 90 per cent of the green power adopted by mobile operators, only three per cent of cell sites actually use renewable energy sources, mainly in off-grid locations. PHOTO: ERICSSON

So-called 'green' telecoms technologies have been around for a while now but mobile operators still face deployment challenges, as DR. NICOLA DAVIES and RAHIEL NASIR explain.

The availability of electricity is one of the biggest problems facing mobile networks in developing regions. It is estimated that around forty per cent of rural populations in developing countries lack access to grid-based electricity. In Asia, this includes around 625 million people of which around 325 million are in India alone.

And even when operators can plug into the grid, outages and load shedding make electricity supply unreliable. As a result, both off-grid as well as on-grid sites with unreliable power supply rely heavily on diesel generators and, apart from their high running and maintenance costs (up to 46 per cent of opex for MNOs), it is well-known that gensets produce a high level of emissions.

Each off-grid site using diesel generator battery hybrid technology burns approximately 13,000 litres of diesel annually, producing 35 tonnes of CO2 emissions. On-grid sites with unreliable power supply produce an average of 18 metric

tonnes of CO2 and use 6,700 litres of diesel every year. In a report published at the end of 2014 (*Overview of the Global Market for Energy to Telecom Towers in Off-grid and Bad-grid Areas*), the GSM Association (GSMA) said estimates indicate that the global telecom industry will deploy approximately 390,000 telecom towers that are off-grid and 790,000 that are in bad-grid locations by 2020. It warned that if these towers continue to use diesel – as is the case for more than 90 per cent of all off-grid and bad-grid towers today – the following is likely to happen:

- ❖ Diesel consumption for towers will increase by 13-15 per cent from today's levels, to more than 150 million barrels per year (the report was based on oil prices at the time of USD1 per litre of diesel). The resulting annual cost of diesel will be over USD19bn in 2020, or USD 5 per mobile-phone user per year.

- ❖ About 45 million tons of CO2 per year will be released, which is more than five million tons higher than the levels they were at in 2014.

The GSMA does not expect the global split of off-grid to bad-grid towers to change significantly in the next four years, and overall it said an additional 70,000 off-grid and 90,000 bad-grid towers will be deployed until 2020.

According to the association, Africa and Asia will together account for almost 80 per cent of this forecasted growth, with the rest mainly coming from Latin America. In Asia, it predicted that India will be responsible for around 10 per cent of the worldwide total in off-grid and bad-grid towers with an estimated 16,500 deployments. That's on top of the more than 230,000 off-grid and bad-grid towers it had in 2014. Indonesia, Pakistan and Myanmar are other Asian nations that are predicted to add a

major number of off-grid and bad-grid towers in the same time period, (around 10,000, 8,000 and 4,000 towers, respectively).

The green challenges for MNOs

For operators in South Asia, heeding the ever greater call for mobile services will result in a considerable investment in cellular infrastructure accompanied by increased emissions in areas which lack grid electricity.

For example, in plans unveiled towards the end of last year, Bharti Airtel said it will invest billions in its Indian networks over the next three years under an expansion initiative dubbed *Project Leap*. The company is India's biggest mobile operator with around 24 per cent market share and 234 million mobile subscribers.

Under *Project Leap*, Bharti will spend INR600bn (around USD9bn) on doubling its base stations to 160,000, give 500,000 villages access to mobile broadband, and reach 250,000 small towns with fixed broadband. Its target earlier this year was to deploy 70,000 BSTs which means more than half of its network will be mobile broadband enabled.

As part of the initiative, Bharti also plans to cut its carbon footprint by up to 70 per cent over the next three years through the use of lower-power radios, investments in green technologies, and a reduced dependency on diesel. Older BSTs will be replaced with smaller and more energy-efficient hardware that uses a single RAN to manage multiple frequencies.

That all sounds exemplary and the kind of changes the GSMA was talking about in its report referenced above: "Conversion to more efficient, greener alternative tower power solutions, which include diesel generator-advanced battery and renewable energy hybrid systems, could save the industry USD13-14bn annually, even after accounting for capital expenditure. Adoption of these green technologies at scale also has the potential to generate approximately 40 million tons and USD100-500m annually in carbon savings."

On the surface, going green with renewable energy is highly feasible in many regions. Photovoltaic (PV) power and concentrated solar power (CSP) generation top the list, followed by wind and biomass, while geothermal energy could contribute significantly in some regions.

The GSMA believes solar PV power alone could generate as much as 656,700TWh across the continent. But according to management, engineering and development consultancy Mott MacDonald, exploiting these potential power sources could be more complicated than the statistics suggest. Dave Tanner, the firm's director of technology strategy and design, believes mobile service providers are deploying renewable options in specific locations that are economically feasible. Citing examples from Africa, he says: "In Niger and Mozambique, between 15 and 30 per cent of sites are powered by solar – although this may also be grid backup – while in some countries solar use is virtually nil.

Renewable options are specific to each location, both in terms of power and traffic demand as well as available sunshine hours. Hybrid is being more widely adopted as an option to reduce fuel costs and reduce noise pollution."

The GSMA reports that although many operators are already striving to use green technologies – such as solar and wind power, as well as fuel cells and biomass power generation – to reduce reliance on diesel generators, they face several challenges. These include the lack of economies of scale in certain areas owing to the low number of subscribers per site, a shortage of skilled technicians in host countries, and particularly low levels of expertise in renewable technologies. It also warns that without committed local partners to support green power initiatives, the efficiency and success of green alternatives will be limited.

Solar power offers the most promising alternative energy solution so far because it is highly scalable and can easily be adjusted by adding extra modules should load increase.

However, the high capex and space requirements this brings with it presents a problem for mobile operators. While solar represents 90 per cent of the green power adopted by MNOs, only three per cent of cell sites actually use renewable energy sources, mainly in off-grid locations. This low level of adoption can be attributed to the barriers green technologies present which can be summarised as follows:

- ❖ A lack of affordable and reliable alternative energy technologies
- ❖ A need for high capital expenditure
- ❖ The need for accessible technical resources and reliable local partners
- ❖ Support from regulators and government policymakers

Solar energy is the most widely implemented form of green energy being used by many cellular networks in developing regions.

Wind turbines to power cell sites have not gone further than a few pilot projects and face many more hindrances. High maintenance costs and variable wind speeds that impact on reliability, and

therefore investment risks, have made this energy option less feasible unless it is adopted in conjunction with other technologies such as solar power.

Hydroelectric power may be feasible for sites near a suitable body of water but small-scale generation is hindered by a lack of available technology and suppliers. The capex needed to use HEP to fuel cellular sites has yet to be fully investigated.

Biomass technology may seem attractive, but in telecoms it presents a set of challenges that include the scalability of power generation plants, the complexities of constructing and running them, and the need for reliable supplies of biomass. In addition, sustainability is of concern. For example, the use of crops or land traditionally used for food production can ultimately impact on food supply and prices.

Fuel cell technology shows promise, and new innovations are being supported by an increased effort to ensure that the supply chain supports reliable operation. For instance, Malaysia's Digi recently claimed it had become the industry's first operator to develop a cell site powered by a self-sustaining system that will not require refuelling.

As part of a proof of concept, the cellco is spearheading an industry initiative that aims to look at the possibility of using hybrid hydrogen fuel cells to reduce or even replace the use of diesel. Earlier this year, it began conducting tests at a pilot base station site in the district of Rompin in Pahang, south east Malaysia. The hybrid system works by extracting water from the atmosphere. It then breaks this down to produce hydrogen which powers the fuel cell and generates electricity for the base station.

According to Digi, currently available hybrid fuel cells are largely dependent on the delivery of hydrogen gas tanks, methanol or other fuel sources to power the cells. But the system it is testing in Malaysia does not require any of these and is therefore able to achieve carbon neutrality – the only by-products of this form of energy are oxygen and water, and no greenhouse gases are released into the atmosphere as a result of the process.

Digi's pilot study is ultimately funded by Malaysia's telecoms regulator, but for most



In what's claimed to be a first in the mobile industry, Malaysian operator Digi is trialling a zero emissions hybrid hydrogen fuel cell system at a pilot base station site near Rompin, Pahang (pictured).

operators around the world, new technologies such as hydrogen fuel cells are costly which creates barriers to their large-scale adoption.

Nonetheless, alternative energy sources do offer significant benefits. While mobile users and the environment gain from the more reliable communications brought about by the technology, the GSMA estimates that green energy will reduce annual opex for MNOs by as much as USD17,000 per tower per year – even when coupled with generators. This figure is based on an emissions reduction of 60 to 70 per cent per tower which would require an investment of USD42,000 per site.

Governments have a strong role to play in making the use of renewable energy more feasible through policies and incentives. With the mobile network industry being among the largest consumers of electricity and diesel, and with public utilities already stretched to the limit, many administrations across the region are either working on or have implemented renewable energy incentives. These include tax breaks and relaxed import duties, and in some countries grants and subsidies are also available.

That all sounds encouraging. However, the GSMA says financial inducements alone aren't enough to ease the telecoms industry's transition to renewable technologies. It states that building technical capacity will also be vital to the implementation of more environmentally-friendly technologies.

Creating more efficient gensets

The standard figure for diesel generator efficiency is 20 per cent. That suggests a huge amount of energy wastage, but is this still the case? Greater fuel

efficiency and reduced emissions could make diesel generators a greener alternative.



According to Cummins, renewable energy isn't always reliable. It believes combining renewable energy sources with more efficient gas or diesel generator solves the issues while still reducing emissions. For instance, while the QSK95 is the company's most powerful diesel genset to date, it is also claimed to offer best-in-class fuel economy with savings of more than USD400,000 over the course of 8,000 hours of operation.

David Tanner,
Director
technology
strategy &
design,
Mott MacDonald



“Advances in base station technology will continue to expand the areas where renewables can be applied.”

One of the solutions to improve energy efficiency is to allow the generator to power equipment while storing surplus energy in batteries. After all, a lot of the wasted energy from gensets comes from using only 'part load' energy. In addition, the efficiency of generators can reach up to 60 per cent depending on engine types and technologies.

With calls for improved energy efficiency and reduced emissions becoming ever more insistent, generator manufacturers are working to address the problem. According to some big name specialists such as Cummins, renewable energy isn't always reliable. It believes that combining renewable energy sources such as solar or wind power with a gas or diesel generator solves the reliability issues while still reducing emissions.

Cummins is currently working on a project in which municipal waste, agricultural waste, and sewage could be used to produce enough gas to run large generators. The costs and scalability of such an operation are yet to be determined, but the project is just one of the initiatives being tackled by the company's 'Emissions Solutions' arm.

Cummins also notes that by using a combination of strategies, MNOs can cut their energy requirements, subsequently reducing emissions and saving costs. Radio transceivers that are able to handle high temperatures without air conditioning, energy efficient radio equipment and building materials (such as substituting bricks and mortar for plastics), sharing equipment, and using a hybrid between renewable energy and diesel generators will all decrease the dependence on non-renewable power sources for mobile operators.

Eltek shares these views but also reckons that higher efficiency rectifiers, even if they only produce 1-2 per cent in additional savings, will make an enormous impact on an industry-wide scale. According to the firm which specialises in high efficiency power electronics, “tangible advantages” will accrue through using the most efficient rectifier technologies. Emerson Network Power supports this view by stating that the cost of ultra-efficient rectifiers can be recovered in 1.9 years, with a ten-year return on investment of 49 per cent.

Mott MacDonald's Tanner says: “Advances in base station technology are bringing increasingly efficient electronics into the networks, which will continue to expand the areas where renewables can be applied. The main driving factor behind this will be cost.”

However, there seems to be no single solution to energy efficiency and reduced emissions. Huawei is among the proponents of a multi-faceted approach. Through the use of shared embedded power, mobile site controllers and a robust network management system, the company claims its approach offers the “highest energy efficient power”.

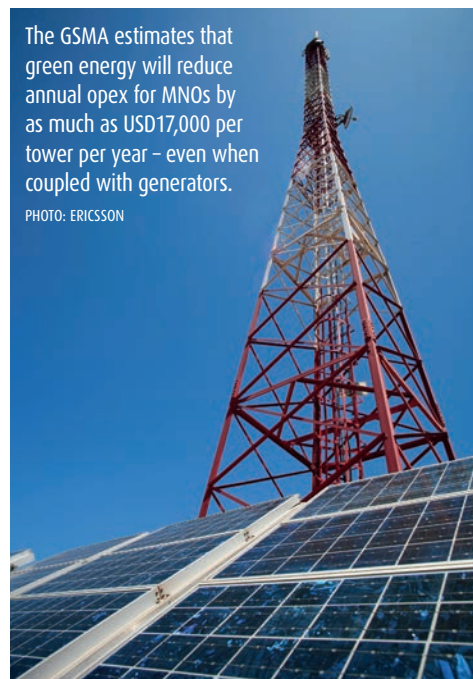
Ericsson has been developing base station technologies since the very beginning of GSM. The Swedish company claims it implemented a 40 per cent power reduction in its BSTs as far back as 2008, and its recent focus on the IoT has led to LPWA (low-power, wide-area) applications for operators. Ericsson also says it has supplies solar base stations in Indonesia since 2007, and in keeping with its track record the firm is implementing solar power, which it says is “more reliable” than diesel generators in its efforts to connect the unconnected.

Meanwhile, Ericsson's Scandinavian rival Nokia says it is targeting flat energy consumption despite network growth. It has identified five points that need to be addressed in order to ensure energy efficiency: more productive base stations; site optimisation; network architecture evolution; network management and control; and network modernisation.

Apart from eliminating cooling and feeder losses, Nokia says it aims to reduce “idle” network elements. According to the company's 2020 energy strategy, renewable energy is the future for powering cellular technology, both in areas where power supplies are unreliable, and in countries and continents where this is not an issue. Solar energy is the current focus, but the viability of wind power and fuel cells is also being investigated. ■

The GSMA estimates that green energy will reduce annual opex for MNOs by as much as USD17,000 per tower per year – even when coupled with generators.

PHOTO: ERICSSON





FG Wilson launches new generator set range for telecoms



Diesel generator set brand FG Wilson marks 50 years in business this year and has just launched a new 6.8 – 25 kVA range designed with telecoms users in mind. Michael Milligan, FG Wilson Account Manager talked with us about FG Wilson and the new range.

Founded in 1966, FG Wilson was among the first to bring mass-scale production to generator sets, launching self-contained generator sets which were simple to buy and operate and were easy to install. The brand is now a major player in the global market for generator sets installing over 600,000 since 1990 alone, with a total installed capacity of almost 90GW - more than the total installed mains electricity capacity of a country like the UK.

The new 6.8 – 25 kVA range is among several new products being launched this year, and says Michael, its design and development have been in close partnership with customers: "First and foremost, this is a very customer-defined product. We spent a great deal of time simply talking with our customers and dealers and working through issues together to understand what was important."

"There was a real focus on product operating costs and this has led to a packaged generator product which is ideal for telecoms users, or indeed for any customer who operates at sites which are remote or difficult to access."

The new range is aimed at either hybrid or generator-only applications. To reduce operating costs, site visits for maintenance and fuel replenishment, the range offers

1,000 hours between service intervals, and comes with set-mounted fuel tanks of up to 2,000 litres. The ability to monitor generator sets from the Telecom NOC maximises uptime and allows preparation for site visits minimising servicing costs and ensuring that site visits are effective.

The product options list includes a flexible range of enclosures offering three levels of sound attenuation to help ensure that it meets local noise regulations and also mean that customers can choose the enclosure which is right for their needs.

Control systems played a big part in product design. Michael says, "We have incorporated a great deal of flexibility into control systems and remote communications to ensure that our generator set integrates seamlessly with any hybrid system. And we are partnering with several established hybrid manufacturers to confirm compatibility and ensure efficient and fast deployment of our products on site."

As with all FG Wilson products, the new range has been tested and validated at FG Wilson's Larne facility in the UK, a \$26 million Centre of Excellence which also houses

Europe's largest Hemi-Anechoic Chamber for noise testing. Here, all FG Wilson products are given intense pre-launch testing which include vibration, engine/alternator cooling, electromagnetic compatibility, noise, water ingress and rating/transient performance.

Michael says this is especially important. "We are a volume manufacturer and we take reliability extremely seriously. We know from past experience that rigorous upfront design, testing and validation lead to superior reliability throughout a product's lifetime and that this can save customers a substantial amount of money over time. That reliability is also underscored by FG Wilson's global network of over 400 dealers who offer automotive industry levels of service starting with product selection through to installation and a lifetime of support. They're trained by us and supported by our parts system which stocks over 11,500 parts and delivers three million parts a year, not only for our current products but also for legacy products."

The new range is now available to order from FG Wilson. You can find out more from www.fgwilson.com or from your local FG Wilson dealer.



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The power to evolve

Carriers in South Asia can use Network Function Virtualisation to give themselves a competitive advantage, says CHRIS HADDOCK.

Network Function Virtualisation is a development that promises significant benefits for carriers, and momentum has grown rapidly since the technology's inception three years ago. Today, NFV is not just a drawing board concept that has potential but an approach that is being used by operators in live networks.

Over the next few years we can expect NFV to move to the centre of the region's mobile carriers' network infrastructure architecture. The technology fundamentally changes the way networks are built and operated, allowing more agility and flexibility in the way they can be managed, and how new services can be developed.

The key concept of NFV is that it can be used to virtualise entire network functions and systems in a carrier's network. These functions have traditionally been deployed as 'network appliances' on dedicated hardware which is often proprietary, usually expensive, and always difficult if not impossible to change without the help of the hardware provider. With NFV, carrier network operators can now leverage the

flexibility, price and performance of virtualised computing resources. They can deploy multiple network functions on the same, virtualised and standard hardware platform.

But the technology goes further than just using standard commodity hardware and building blocks of virtualised software. NFV also helps to break open the closed, rigid, 'hard-wired' nature of network functions. It holds the promise of delivering the network function flexibility, adaptability and agility that traditional 'dedicated box' approaches lack.

Centralised architecture drives efficiencies

Happening alongside NFV is the transition to IP multimedia subsystem (IMS) next-generation architectures. IMS offers a good opportunity for carriers to start virtualising their networks. It gives them the elasticity to scale as needed in order to deliver services more rapidly and efficiently. This means network functions do not need to be dimensioned for the annual peak but

run at substantially below their maximum capacity for most of the time; capacity can be increased for peak periods and decreased as required.

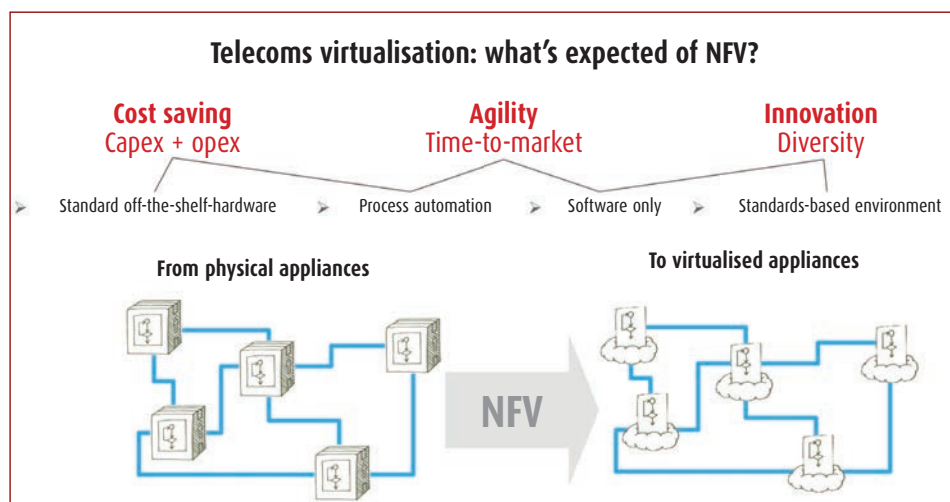
Diane Myers, research director for VoIP, UC and IMS at IHS, shares this sentiment: "One of the biggest drivers for NFV is the ability to scale services up and down quickly, and introduce new network services more efficiently and in a timely manner, which makes IMS a good early fit for NFV."

Some carriers in South Asia are currently rolling out IMS networking infrastructures as they look to offer more than just basic voice and SMS services to subscribers. If a fully virtualised IMS network is deployed, carriers can scale its capacity as needed as their subscribers move from legacy networks to LTE and IMS services.

In South Asia, ARPU is much lower than in other regions. Although this is offset to some degree as there are large numbers of prospective customers, it remains the case that the continent's carriers are in even greater need of reductions in capital and operational expenditure than many of their international counterparts. NFV and completely virtualised networks promise to deliver significant benefits in this regard.

This approach need not be limited to a carrier in a single country – there are tremendous economies of scale to be had from deploying a virtualised or cloud-based network once for use across a carrier group operating multinationally. For carriers with networks serving customers in multiple countries throughout the continent, such as Axiata, Airtel, Telenor, *et al*, there are clear financial and efficiency benefits in having network functions that service multiple countries.

Furthermore, the pan-country, virtualised model can also be used to consolidate expertise in commercially attractive locations where the necessary skills are available, as well as to access markets in more troubled regions safely.



Using NFV to take control of service development

NFV can be used to empower operators to evolve their networks and services at their own pace, ahead of and in response to local competition.

In South Asia, smartphone ownership is surpassing computer ownership and mobile subscribers are becoming more sophisticated in their use of applications and services. Like many developing regions, the smartphone in Asia is much more than a mobile phone. It is used for banking, giving people cheaper access to their finances; for healthcare and medicine, reducing the need for doctors to travel long distances; and for

commerce, central to the success of entrepreneurs and farmers. The use of mobile services is therefore vital to the region's people, even in the remotest rural areas. This makes it particularly important for carriers to be able to tailor their network functions and services to their local needs. Otherwise they could end up reflecting the functional needs (and the associated limitations) of countries with very different characteristics.

NFV makes it possible to develop substantial variations to pre-baked network services, and tap into the requirements of a specific customer base. Carriers can move to a web-style 'DevOps' model, where they provide specialised services to their customers and refine these regularly.



Chris Haddock,
Head of
marketing,
OpenCloud

In addition, NFV assists the DevOps-style service development and testing model. Traditionally in telecoms, carriers have used a physical test network to validate their new services prior to deploying them in the live network. Access to the test network is typically the major bottleneck in the service development and deployment lifecycle. With an NFV-based network, multiple cloud-based replica test networks can be created rapidly, at a very low cost as and when they are needed. The test and validation bottleneck to service deployment is removed, and perhaps just as important, the virtualised test network provides an accessible and cost-effective experimental testbed for new innovation.

NFV therefore encourages innovation where development and operational deployment are closely linked. The evolution of services can come from internal developers or third parties who can create specific applications and customised solutions for different user segments. NFV also makes it easier for carriers to create bespoke services that are targeted at specific regional markets and can alter them for regulatory requirements. This can support the move towards network regionalisation as service variants can be easily developed and rolled out to various countries or regions from a single network location.

Furthermore, a focus on service development can become commercially feasible for carriers as virtualisation enables service scalability. The inherently flexible nature of virtualised software means that services can be scaled up or down, depending on the need for capacity at any given time. This 'grow on demand' facility mitigates risks when launching new services. As a result, consumers and businesses in South Asia could see a range of new VAS created specifically for their needs.

Telecommunications in South Asia is undergoing rapid change with the emergence of smartphones and LTE networks. Investment in NFV can enable carriers to scale their networks and services in line with customer demand, rather than buying capacity upfront according to business model user projections. It offers a more economic and efficient model for converging and centralising their networks.

South Asian carriers can also use NFV as an opportunity to differentiate their offerings and serve their subscribers better. Services that are designed to meet the specific needs of customers need to be conceived, created and refined locally by people who understand the specific market requirements. NFV can be a key enabler of service agility and flexibility across the continent's growing telecoms marketplace. ■

A LESSON IN DEVOPS

Vodafone entered the Egyptian telecoms market as the second operator in 1998, and was formed by a consortium that originally also included Air Touch as well as local and international partners. In 1999, Vodafone Group acquired the Air Touch share, and three years later it purchased the seven per cent stake held by French telecoms giant Vivendi.

Over the years, Vodafone has become Egypt's leading mobile operator. According to the Ministry of Communications and IT's latest market indicators published in June 2016, there were 95.26 million mobile subscribers in the country as of March 2016. Vodafone currently has a market share of around 41 per cent.

The reputation and value of the company's brand are said to be built on Vodafone's global commitment to responsible and honest behaviour within the communities where it operates. Since its inception, corporate responsibility was an integral part of Vodafone's operation in Egypt, and alongside this it also has a commitment to innovation and the development of customer-centric services. This is the cornerstone of a DevOps mentality.

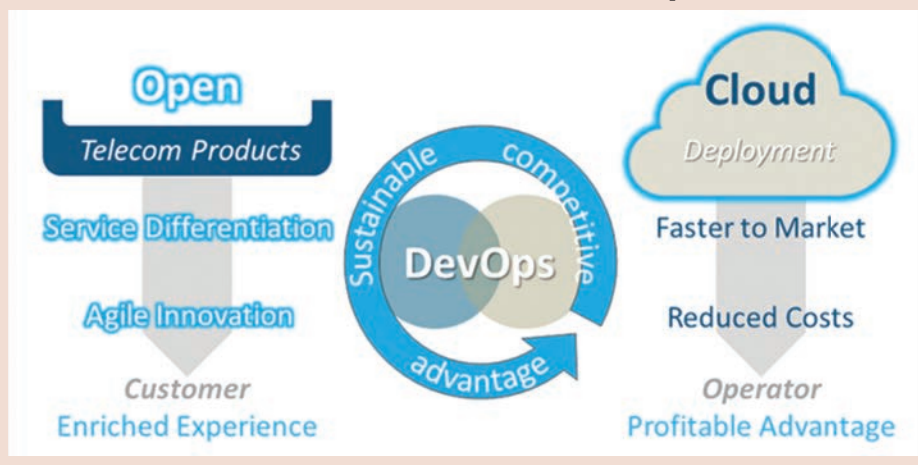
In 2014, Vodafone Egypt selected *OpenCloud Rhino* to deliver a range of core services and to enable innovation of future services. Full rollout of the service delivery platform (SDP) followed a successful proof-of-concept phase where a number of services were trialled.

The telco's main objective was to introduce a convergent and open SDP to consolidate existing GSM IN services on to one platform, and to enable the introduction of new services. As preparation for LTE and IMS, Vodafone Egypt wanted to develop services for use by both its GSM network and also IMS for LTE subscribers.

As an example of this, the first new service developed on the SDP was *Multi SIM*. This enables a subscriber to activate two additional SIM cards from their current mobile phone and for all the SIMs to share the master number. Users can then initiate and receive calls as well as SMS messages from any of the cards, and their main number will be presented to the other party.

An extremely important aspect of the OpenCloud proposition was the openness and high productivity of the platform, enabling local development companies to produce services instead of traditional vendors. This means Vodafone Egypt can commission services from local development partners and gain the efficiencies of local supply, alongside contributing to and helping grow the country's economy.

Following the successful 'go live' of *Multi SIM*, a range of other services have now been created by local development companies. The open SDP enables Vodafone Egypt to not only compete with superior, differentiated business and consumer services, but also with customer service as well as on price.



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World's first LoRa-based IoT network goes live in Netherlands

 Dutch telco KPN has unveiled the world's first IoT network based on LoRa (long range) WAN technology. It will use the *ThingPark Wireless* platform from French specialist

Activity to connect a wide range of objects in markets as diverse as agriculture, smart building, transport infrastructure and healthcare applications.

The two firms have been working closely together since November 2015 and have now installed several hundred LoRa antennas across the country. Around mid-July it was announced that KPN's IoT network had gone live, initially in Rotterdam and The Hague.

Activity says its *ThingPark Wireless* system provides long-range coverage for low-power consumption sensors. The platform offers a variety of features including storage for sensor data, embedded software and cloud solutions to connect devices, and a dedicated online marketplace for

IoT sensors, applications, etc.

Earlier this year in June, Activity also announced the launch of *ThingPark* in China. It has partnered with Foxconn Technology Group to offer end-to-end IoT services from sensors and gateways to network management and SaaS. *ThingPark* China will begin business operations in the third quarter of 2016.

"China is an opportunity like no other IoT market," said Activity CEO

Mike Mulica said KPN has "made good" on its ambition to turn The Netherlands into a smart nation.



Mike Mulica. "It's growing 30 per cent a year, and a third of the world's 15 billion connected things in 2020 will be in China."

Satellite use expands in French Polynesia to meet growing broadband demands

 The Office des Postes et Telecommunications of French Polynesia (OPT) has signed a new and expanded contract with Intelsat for connectivity on *Intelsat 18*.

State-owned OPT delivers fixed line and postal services to more than 80 inhabited islands covering an area of five million square kilometres. It has three wholly owned subsidiaries: Vini for mobile, internet services, TV content and network solutions; ISS for software and electronics services and accessories; and Tahiti Nui Telecoms for data centre and hosted infrastructure.

In 2008, OPT commissioned Intelsat to design a Ku-band beam

on *Intelsat 18*, which orbits at 180°E, so that it could provide coverage to all of French Polynesia, including the Cook Islands.

Under a recently signed multi-year agreement, OPT will be able to further expand its wireless infrastructure to meet the fast-growing mobile broadband and internet needs of businesses and communities on the more remote islands located in the South Pacific.

OPT president and CEO Jean-François Martin says: "The optimised performance of *Intelsat 18* provides a complement to our terrestrial infrastructure which will enable OPT

to further extend its network, increase its business and, more importantly, provide reliable internet connectivity to the citizens of French Polynesia, reducing the digital divide between Tahiti and the remote islands."

OPT says Intelsat's satellite solutions have enabled it to scale its network as the demands for internet and mobile broadband connectivity have continued to rise. Intelsat adds that given the terrain of French Polynesia, satellite is the only way to connect remote islands to the mainland, and help telecom providers scale their networks to meet growing business demands.

SK rolls out nationwide LPWAN

 South Korea Telecom plans to invest more than KRW100bn (around USD84m) over the next two years to boost its IoT business. It will build a nationwide low-power WAN within this year, develop IoT-dedicated modules, and upgrade its IoT platform, *ThingPlug*.


The operator says its plans are in step with the Korean Government's move towards promoting new industries. For instance, the Ministry of Science, ICT and Future Planning has now revised the maximum transmit power for the 900MHz frequency band from 10mW to 200mW to nurture the IoT industry. This will help the country's operators overcome limitations caused by the low transmit power and to secure the basis for many new IoT services.

Along with the nationwide LPWAN, SK Telecom will also establish an IoT control centre to monitor the real-time status of the nationwide network and all connected devices to optimise operation.

Moreover, the operator says it will develop IoT-dedicated modules that can be embedded into appropriate devices. The modules will have open APIs, and to further support startups and SMEs SK Telecom says it will provide them free of charge.

The operator is a member of the LoRa Alliance which promotes the LoRa protocol (LoRaWAN) as a global and open standard for IoT.

Longest rail tunnel safer with Tetrapol

 The world's longest railway tunnel, the 57km Gotthard Base Tunnel (GBT) in Switzerland, is using the Polycom radio system which is based on Tetrapol.

Covering Switzerland and Liechtenstein, Polycom is used by public rescue and safety organisations as well as by operators of critical infrastructures. The system's Tetrapol technology is supplied by Airbus Defence and Space (ADS).

The company explains that the system in each of Gotthard's two single-track tunnels consists of two overlapping cells for both tubes. Each cell works independently and is based on nine transceiver stations. Coverage in the tunnel is ensured by a radiating feeder cable that receives the radio signal



In addition to Tetrapol, Gotthard also has a vast data network connecting 152km of passages, main and access tunnels.

from two directions. According to ADS, communication would therefore still be possible on both sides even if parts of the system became damaged by fire.

Following an initial construction phase which began 17 years ago, the GBT began operations at the start of June 2016. It connects northern and southern Europe through the Alps,

and journey times for passenger trains between Zürich-Lugano-Milan have been cut by about an hour.

As well as being the world's longest rail tunnel, Gotthard is also the deepest – in some places it is separated from the Earth's surface by around two kilometres of rock.

In addition to Tetrapol, the GBT also has a vast data network based on more than 450 Alcatel-Lucent *OmniSwitch 6855* switches. The network connects tunnel lights, racks, power systems, doors, drainage and ventilation systems.

Data gathered by sensors, monitors and surveillance equipment in the GBT's 152km of main and access tunnels, and cross passages are transmitted to two control centres at the tunnel's north and south ends.

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Lenovo debuts first *Tango*-enabled smartphone



Lenovo has unveiled the world's first smartphone that uses Google's *Tango* augmented reality (AR) technology.

The *PHAB2 Pro* features sensors and software that map its surroundings to enable various AR experiences. For example, one of the first *Tango*-enabled apps is from home improvement company Lowe. *Vision* enables customers to measure spaces and visualise how appliances, décor, counter tops, tiles, etc., will all look and fit together in a room.

There are three core technologies behind *Tango*: firstly, by using motion tracking the *PHAB2 Pro*'s 'eye' sees its own location in 3D; secondly, area learning tells the smartphone its location; and thirdly, depth perception enables the device to analyse the shape of the world around it by detecting surfaces and obstacles.

"Now for the first time ever, your smartphone can visualise and understand its surrounding objects and environment via sensors that capture more than 250,000 measurements a second," says Lenovo.

All the data simultaneously received from multiple camera sensors, the gyro and accelerometer are processed and time stamped by Qualcomm's *Snapdragon 652*. Lenovo reckons this results in a fast and smooth augmented reality experience, where 3D AR overlays track more naturally to the physical surroundings.

Other features include LTE connectivity, a 6.4-inch display with QHD (2,560 x 1,440) resolution, six megapixel camera that supports

4K video recording, and Dolby playback and surround sound recording.

The *PHAB2 Pro* uses Google's *Tango* system to create various augmented reality experiences.



TETRA expanding globally but Europe dominates



Europe is expected to remain the world's largest market for TETRA and will continue to rise, according to IHS.

In its latest global report and analysis, the critical communications industry specialist says the global market for the technology is "healthy" with growth expected in all regions.

Eastern Europe in particular is projected to see rapid expansion. Here, IHS forecasts new terminal shipments in the industrial sector to increase by almost 50 per cent, and in transport by nearly 27 per cent. And Western Europe is expected to remain the

largest global market for active TETRA radios with a 53 per cent share of the installed base as at the end of 2015.

Phil Kidner, CEO of the TETRA and Critical Communications Association, said: "2015 has been an exceptional year for TETRA in Europe, with the completion of the nationwide networks in Germany and Norway. We are also seeing re-investment in existing TETRA networks, with a huge amount of activity in renewing both infrastructure and terminals."

Although Europe remains the largest market, IHS believes it will be challenged by the end of 2020

as the installed base increases in other regions including Middle East and Africa, and the Americas. The American installed base is forecast to be led by Latin America, although North America is also forecast to grow substantially.

Mission-critical applications continue to make up a major part of the TETRA market, with public safety and security representing more than 56 per cent of the installed base. However, over the next five years, IHS predicts that business-critical applications will see the most growth, including sectors such as utilities and industrial.

Small cell system for data-hungry London



CCS (Cambridge Communication Systems) and Luminet plan to rollout a small cell network across London. The partners say this will provide mobile operators with readily-available wireless backhaul for their small cell deployments, and enable enterprises to receive up to 1Gbps internet access.

According to CCS, although small cells are recognised as the ideal solution for operators to cope with the increase in mobile data, deployment is often hindered by site acquisition and associated planning approvals.

The firm aims to address this through its partnership with managed

service provider and ISP Luminet. The latter already has more than 1,900 sites in London via its fixed wireless access infrastructure. It also has two 112MHz frequency channels in perpetuity at 28GHz which will be used by CCS' *Metnet* self-organising wireless backhaul system. Luminet has integrated its 3D mapping and site database into the *Metnet* planning tool in an effort to simplify the design and planning stage of each London small cell deployment.

The 3D map data provided by Luminet will identify demand hotspots in the capital for on-net delivery. It is claimed to be "highly accurate", with a resolution of less than one metre,



CCS says its *Metnet* small cell system has been designed for discreet street installation on lamp posts, walls, rooftops, etc.

allowing for reliable one-by-one or mass predictions without the need for physical site surveys.

The partners say their wireless backhaul network is planned for 23 partitions and 250 polygons across 1,050 small cell sites, enabling a transit capacity of 0.012 GkM (Gbps/km²/MHz).

SIMs helping to monitor fuel tanks



Sensile Technologies will use 25,000 SIM cards from Orange Business Services (OBS) to monitor more than 60,000 oil and gas tanks across 60 countries.

Previously, the Switzerland-based IoT specialist used 2G compatible devices to power its telemetry solutions: *GASLink* and *NETRIS 2*. In a three-year deal, OBS will support the two systems worldwide, extending their coverage to include 3G/4G devices.

GASLink and *NETRIS 2* are installed directly in an oil or propane tank and regularly send level measurements via GSM to Sensile's *Oil Link* cloud. Merchants and their hauliers receive the data directly in their ERP systems



As well as using 2G (SMS) to transmit data, the *NETRIS 2* remote tank monitoring system can also use 3G and 4G, as well as create a short-distance RF connection.

to trigger deliveries automatically.

Thanks to the optimisation of deliveries based on live data, OBS says they can lower their logistics costs by at least 25 per cent, without the risk of customers running dry. In

addition, customers can access the *Oil Link* web portal on smartphones to monitor consumption.

According to estimates by Berg Insight, global M2M SIM shipments increased by 19.4 per cent in 2015 to reach a new record of 96 million. East Asia, North America and Western Europe were the main markets in 2015, accounting for around 75 per cent of the total demand.

The analyst believes the latest 3GPP standards for LTE will contribute "substantially" to growth in the next coming five years. It predicts that M2M device shipments will increase at a CAGR of 21.7 per cent to reach 256 million by 2020.

Nokia's LTE alliance



Nokia has announced the formation of the Mission Critical Communications Alliance, a global collaboration to formalise standards in the use of LTE for public safety. The alliance will bring various stakeholders to a single platform with which to inform and guide policy makers on the benefits of LTE-based public safety solutions for the provision of high-quality and robust critical communications services. More than 10 service providers and agencies such as Mobile Radio Center from Japan and Vodafone Hutchison Australia are participating in the programme.

Africa's half a billion



More than half a billion people across the continent are now subscribed to mobile services, according to the GSMA. The *Mobile Economy: Africa 2016* study published at the end of July revealed that there were 557 million unique subscribers across the continent at the end of 2015, equivalent to 46 per cent of the population. The GSMA said this makes Africa the second largest but least penetrated mobile market in the world. The region's three largest markets – Egypt, Nigeria and South Africa – together accounted for around a third of the total subscriber base.

Arqiva in-flight Wi-Fi



Comms infrastructure specialist Arqiva has been selected by Panasonic Avionics Corporation to provide its hosting, connectivity and teleport uplink services via Telesat's new high throughput satellite, *Telstar 12 VANTAGE*. The multi-year deal will see Arqiva deliver a range of mobility services for Panasonic, including inflight Wi-Fi, which will operate round the clock from its Chalfont Grove teleport site near London. Signals are extended to the Panasonic Network over Arqiva's 2.5Tbps core transmission network.

ZTE claims new record for 800G long-haul network



ZTE reckons it's set a new transmission record for a single-carrier 800G long-haul network. In a demonstration carried out earlier this year in China, the company said it successfully transmitted 120Gbaud WDM 16QAM signals over 1,200km terrestrial fibre links. It's claimed this is the highest symbol rate reported so far for 16QAM signals based on ETDM (electrical time division multiplexing).

In the demo, ZTE used 12 x 150GHz WDM channels. Each was loaded with 960Gbps (800Gbps data signals and 20 per cent FEC emulated overhead bits) over a 1,200km link based on 100km spans of *TeraWave* optical fibre.

ZTE said the achieved data rate interface ensured spectral efficiency of 5.33b/s/Hz. It added that both the transmitter-side, and the optical pre-emphasis and receiver-side MLSE (maximum likelihood sequence estimation) were utilised to mitigate the narrow filtering effect caused by bandwidth limitation of the opto-electronic components.

"Thanks to the high baud rate signals generation, transport interfaces with bit-rates of up to 1Tbps will be achieved in the near future," said Dr. Jianjun Yu, chief scientist at ZTE US Optical Lab. "We can expect that bit rates beyond 1Tbps, such

as 1.6Tbps, will be introduced as Ethernet standard rates since it would be a logical upward path rate from the 400Gb Ethernet interface, which is based on high baud rate signals and high order modulation formats."

Over the last few years, ZTE has carried out extensive R&D on single carrier transmissions. For example in 2013, it completed data signalling at speeds of 400Gbps over a distance of more than 5,000km. In 2015, the company collaborated with OFS America to realise a 400Gbps single-carrier PDM-QPSK signal transmission over 10,000km. This was said to be a world record for 400G transmission.

eLTE broadband trunking at Algiers airport



Algeria will see the first commercial deployment of an eLTE system at an airport in Africa.

Huawei will be responsible for the broadband trunking project at the Houari Boumediene Airport in Algiers. It will provide an eLTE core network, base stations, trunking terminals, multimedia dispatching, as well as other devices and systems.

The airport currently uses TETRA for routine scheduling and dispatch. But its narrowband system is insufficient for broadband data transmission, mobile video surveillance,

or multimedia dispatch. Furthermore, ground handling services take place in a complicated and noisy environment, making voice dispatch error-prone and increasing security risks.

Huawei will deliver a system that is capable of interworking with the existing TETRA platform to improve the accuracy and efficiency of ground dispatch. The vendor says its real-time, large-bandwidth eLTE platform will enable the airport to carry out multimedia trunking dispatch, video surveillance, and other applications on a single network that covers both

indoor and outdoor working areas for the ground staff.

To cope with noise in the airport, Huawei says its system supports throat vibration mic earpieces, noise-cancelling headphones, and additional accessories to guarantee voice trunking performance.

The company adds that eLTE can offer complete video dispatch and real-time monitoring services through backhaul of onsite images to the command centre. It also provides an open eSDK for interconnection with third-party airport applications.

Cloud-based platform helps connect cars



Car manufacturers can now offer owners cloud-based embedded software maintenance and the latest capability upgrades over their vehicle's entire lifecycle, thanks to a partnership between the Movimento Group and Sierra Wireless.

US-based Movimento specialises in technologies such as vehicle re-flash services and innovations in over-the-air (OTA) software to help realise what it describes as the "Software-Defined Car". The firm's customers in the automotive industry include Ford, GM and Volvo, amongst others.

Under the new partnership, Movimento will integrate its OTA technology with Sierra Wireless' device-to-cloud solution to provide

what's claimed to be the industry's first commercially available cloud-based platform to maintain connected cars.

All vehicles have numerous software programs running on a network of electronic control units (ECUs) that need to be individually managed and maintained. Sierra and Movimento say their solution enables automotive OEMs to update software for all ECUs simultaneously over-the-air.

Movimento's software update client runs on the *Legato* Linux embedded application framework available on Sierra's 4G automotive modules. Using the vendor's *AirVantage* cloud platform, it's claimed carmakers can "seamlessly" upgrade all vehicle software by simply logging into the dashboard over a

CTO Mahbubul Alam says Movimento has created a centralised solution from car to cloud.

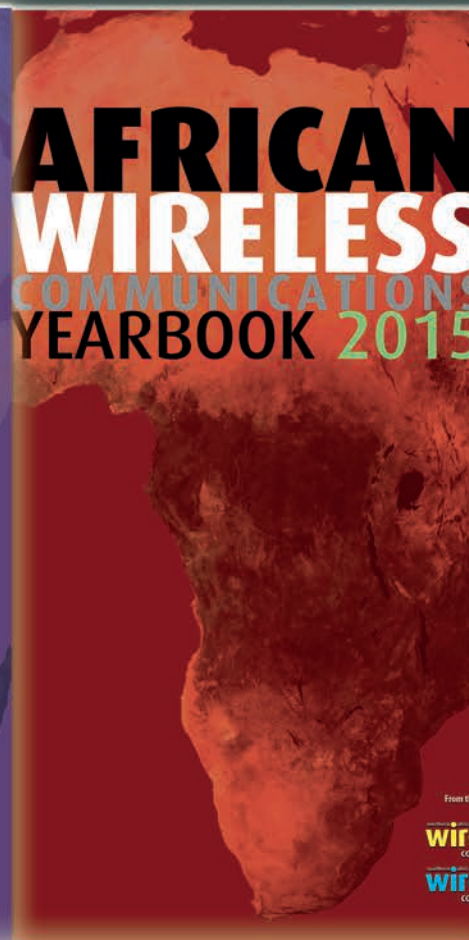
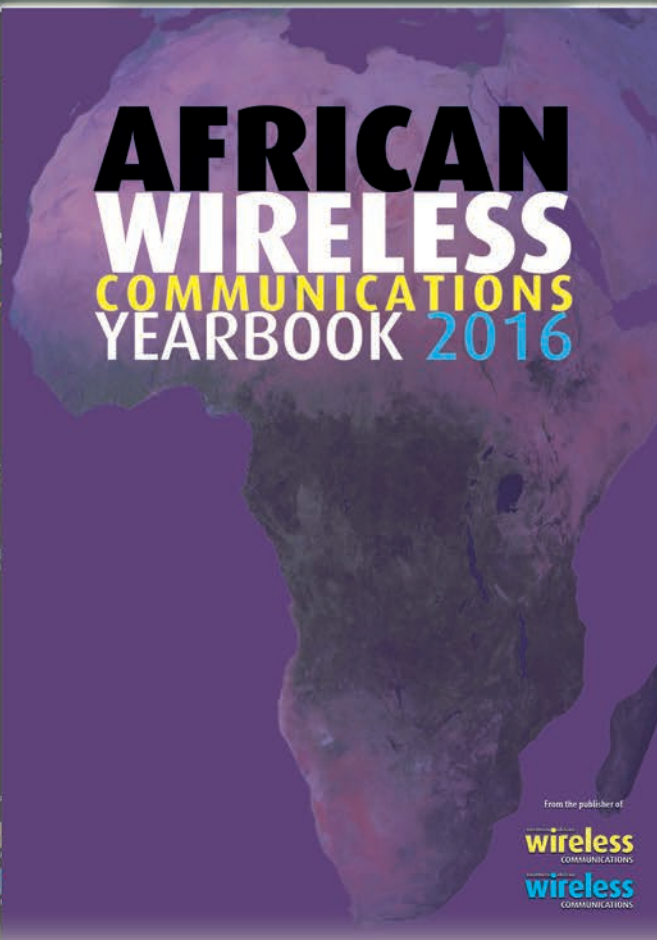
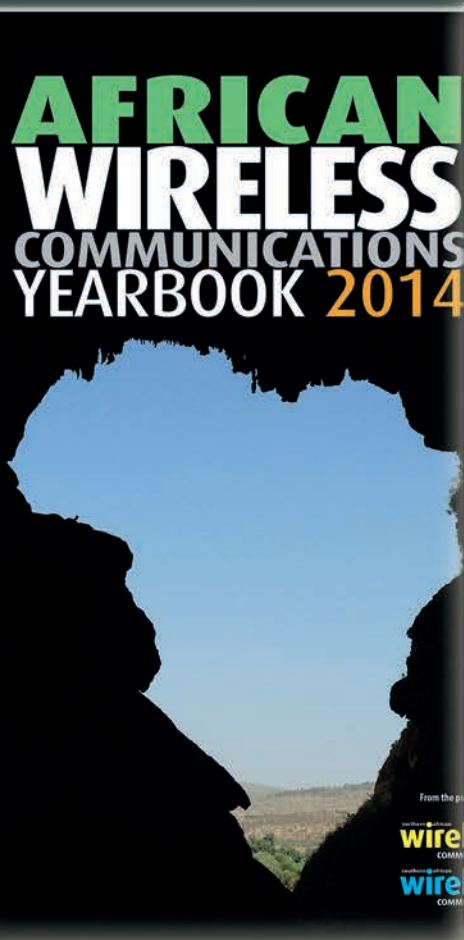


secure network and selecting the appropriate update campaign.

"Rather than worrying about maintaining all the different software and firmware versions, we created a centralised solution from car to cloud," said Mahbubul Alam, CTO/CMO, Movimento. "You don't have to provision every ECU with a dedicated software agent, which reduces CPU and memory requirements, along with overall costs."

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