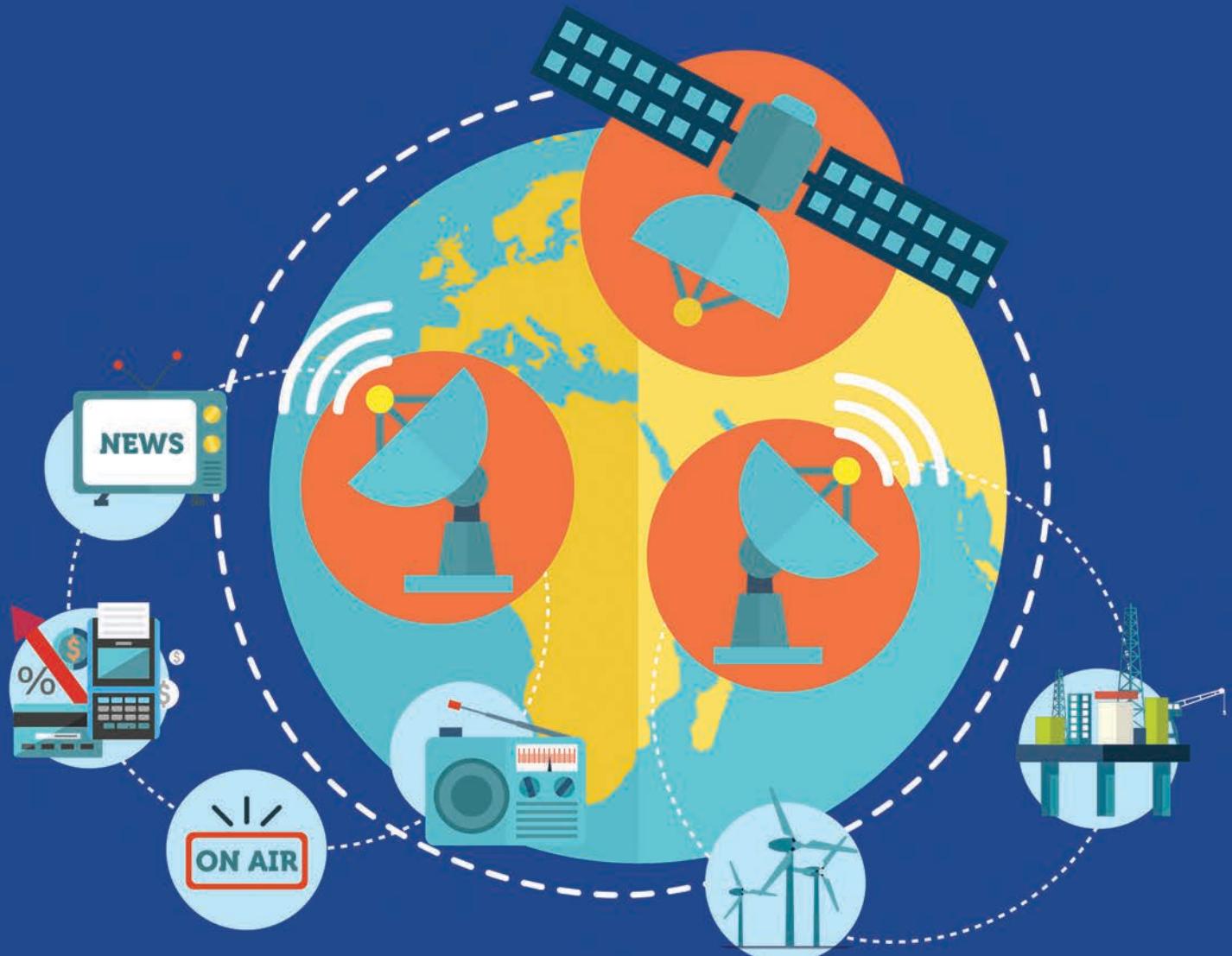


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KADIUM

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Asian operators gain 5G headstart with Ericsson

Ericsson is helping Singapore pave the way towards 5G, and has also carried out the first live end-to-end transmission of the technology in Thailand.

In late February, the vendor announced that it was piloting key technologies in the evolution to 5G that will enable Singtel to offer faster speeds in Singapore by the end of the year. Ericsson's AIR 6468 radio, which is said to provide 64T64R Massive MIMO capabilities, is being tested and progressively deployed on the operator's LTE network. The vendor said Massive MIMO is key to achieving Gigabit LTE speeds as it improves spectral efficiency to triple or quadruple the number of data paths of base stations.

The two partners will also pilot a Cloud RAN. Ericsson said this will provide Singtel with the flexibility



NBTC secretary general Takorn Tantasith outlined plans to support the transformation to a "Digital Thailand".

to centralise, distribute, scale and virtualise RAN functions to "efficiently meet performance requirements today and on the road to 5G".

Earlier this year at an event to mark its 111th anniversary in Thailand, Ericsson carried out the country's first live 5G end-to-end demonstration using its test bed and core technologies.

It claimed to have achieved a peak throughput of 5.7Gbps and latency as low as 3ms. The company said these speeds not only support growing

demand for broadband and video on mobile devices, but also provide a "viable and cost effective" alternative to residential fibre connections.

Thailand's National Broadcasting and Telecommunications Commission (NBTC) expects to have broadband connectivity throughout the country by 2018, covering big cities as well as more than 75,000 villages nationwide.

Speaking at the event, NBTC secretary general Takorn Tantasith said: "Along with the fixed internet deployment, we plan to release more spectrum of 380MHz by 2020 which will add to the 420MHz already allocated to the telecommunications industry. This will handle the rising demand for online services, IoT and innovative applications as the country transforms into a Digital Thailand."

Jio build largest All-IP digital platform

Cisco is supporting Indian operator Reliance Jio Infocomm to expand its All-IP converged network.

Said to be the world's first network of its kind, the multi-terabit capacity platform is built on Cisco's *Open Network Architecture* and *Cloud Scale Networking* technologies featuring IP/MPLS. The vendor says this enables Jio to offer a unique combination of high-speed data, mobile video, VoLTE, digital commerce, media, cloud and payment services.

Since its launch, it's claimed Jio has accelerated India's monthly user data consumption 40 times, the highest in the world. It's also claimed that the operator's premium broadband service, priced at USD0.15 per GB, is the most affordable in the world.

Jio has more than 185,000 miles of fibre and has built what's said to be India's largest cloud data centre in order to develop platforms for applications and vertical solutions. Its All-IP network has been created

to handle ever-increasing volumes of data, and also promises to help shape the future of India with end-to-end digital solutions and broadband for all.

In addition, Cisco says Jio's infrastructure and CDN extends beyond India into Singapore, France, London, New York, Los Angeles, Amsterdam, and Frankfurt. As a result, it says the operator has direct interconnect with global carriers and content providers enabling "low-latency and high-quality experience" for users in India.

Launch success for largest commercial satellite constellation



In what it describes as "one of the biggest tech refreshes" in history, Iridium has finally launched the first satellites that will eventually replace and enhance its existing network with low-Earth orbit spacecraft that span the entire globe.

The first 10 satellites that comprise Iridium's *NEXT* constellation were originally due to be launched by SpaceX last September (see *News*, Q3 2016). But the loss of Spacecom's *AMOS-6* on the launchpad has resulted in a backlog in Spacecom's schedule. Iridium's satellites were eventually launched on 14 January 2017. They

were delivered to a 625km parking orbit where they are currently undergoing tests. Once these have successfully concluded in April, the satellites will then be moved into their 780km operational orbit.

These first 10 satellites are the start of what the company claims will be the largest commercial fleet in space, providing 100 per cent truly global communications coverage.

Over the next 18 months, SpaceX will carry out seven more launches for Iridium, deploying ten *NEXT* satellites at a time. One-by-one, these

Vodafone and Idea to merge in India

As we went to press with this issue in March, reports began to emerge that Vodafone India and Idea Cellular had agreed to merge their operations. It's claimed the deal will create a company valued at more than USD23bn and India's largest mobile operator.

This latest merger in the country's market sector comes amidst a period of aggressive competition from Reliance Jio. Its parent company, Reliance Industries which is run by Mukesh Ambani, has invested USD25bn into a nationwide 4G network that not only offers the lowest data tariffs but also free services for six months.

Earlier in March, Aircel and Reliance Communications (RCOM) – which is run by Mukesh's brother Anil – also confirmed a merger, while in February it was announced that Bharti Airtel will take ownership of Telenor's operations in India (see *Wireless Business*, p13).

According to reports, the Vodafone-Idea deal is expected to close in 2018. Upon successful completion, Vodafone will own 45.1 per cent of the new business while Idea's parent firm, the Aditya Birla Group, will own 26 per cent. The merger will create India's largest celco with around 400 million subscribers which means a 35 per cent market share.

new orbiters will be positioned near a current generation Iridium satellite, each moving at around 17,000 miles per hour as testing begins. Iridium says its "unique inter-satcom links" from nearby satellites will be repositioned to point to each new *NEXT* orbiter as it prepares to take over service. Existing satellites will eventually be de-commissioned.

The second launch was expected in mid-April but this has now been moved to mid-June following continuing delays at SpaceX. The entire Iridium *NEXT* network is scheduled to be completed by mid-2018.

DAMM stays on track with win for Mumbai monorail

DAMM Cellular has been awarded yet another contract to provide a TETRA-based radio system for the second phase of Mumbai Monorail. The Denmark critical communications specialist's system was first used by the Mumbai Metropolitan Region Development Authority (MMRDA) in 2012.

This latest deal is for phase II of the comms network which extends coverage between Wadala Depot and Gadge Maharaj Chowk. As before, New Delhi-based TETRA

system integrator Consort Digital will be responsible for the supply, installation, integration and commissioning of the entire project.

DAMM will provide its *TetraFlex* system to meet the customer's requirements for a feature rich, reliable and safe communication system. The vendor reckons the key to its system's success as a rail solution is its decentralised architecture. It says the platform is a completely IP-based solution with distributed architecture that provides

the "much needed" fault tolerance to communication networks, such as the one being installed for the Mumbai Monorail.

Furthermore, DAMM says *TetraFlex* is integrated to systems for signalling, public announcements, onboard train communications, telephony and centralised recording.

Consort Digital marketing director Devdarsh Jain adds: "The project will be completed in record time due to modularity and ease of deployment of the DAMM *Outdoor* base stations."



The TETRA network will cover the monorail between Wadala Depot (pictured) and Gadge Maharaj Chowk.

The Mumbai Monorail is the first such project in India. It will have two lines and cover 19km with 17 stations when phase II is completed.

Each monorail train will have four coaches with a combined capacity to accommodate around 600 passengers, thereby carrying nearly 300,000 commuters on a daily basis across the proposed route.

LG CNS delivers comms on Malaysia's first MRT railway

Korea-based systems integrator LG CNS is providing essential support for Malaysia's first mass rapid transit (MRT) line.

In December 2016, Urban public transport services operator Prasarana launched the northern section of the Sungai Buloh-Kajang (SBK) line, which features 12 stations from Sungai Buloh to Semantan.

Phase 2, which represents the southern and underground section, is planned to be operational by the end of July 2017, and will have 19 stations. The line will ultimately cover 51km and serve 1.2 million residents in and around Kuala Lumpur.

LG CNS has deployed a backbone transmission network based on IP/MPLS technology to the railway project. This will support a variety of both passenger and operational

services, including: passenger information and security; wireless transmission and operational support subsystems such as SCADA; maintenance management; automated fare collection; and more.

The network consists of Nokia's 7750 Service Router and 7210 Service Access Switch. It is designed to provide scalable Layer 2 and Layer 3 VPN services to support the different railway sub-systems.

End-to-end network and services management is handled by the Nokia *Network Services Platform* which is claimed to enable "efficient" provisioning, maintenance and troubleshooting. The vendor also provided a range of professional services for the project, including network design, installation, test and commissioning and training.

Colt to expand networks in key Asian cities

Colt, the global high bandwidth network provider, will expand and enhance its *IQ Network* in Singapore and Hong Kong in 2017 as part of its plans to invest "significantly" into Asia over the next three years. The company has not revealed how much it is actually aiming to spend.

Colt says *IQ* is a 100Gbps optimised network distributed to more than 200 data centres and carrier hotels around the world, providing best in class service and optimised for SDN, NFV and cloud services.

In Singapore, the firm says its investments will revolve around a series of initiatives that include a large-scale expansion of existing coverage, provisioning of high-bandwidth capacity, and new digging projects for its next-generation fibre. The expansion will comprise both

optical and Ethernet architecture, and provide high-bandwidth services to major buildings and data centres across Asia.

The Singapore-based initiatives are set to begin in April, with Hong Kong and other Asian cities to follow later this year and beyond. Colt says it will also augment these investments by adding key submarine cable routes to its backbone and increasing core resiliency.

Further to supplying high-bandwidth metro connectivity, the company will link businesses in Singapore and Hong Kong directly to hundreds of international cities via its own intelligent global network.

Colt claims to be the only provider which will have fully-owned fibre metro networks in key cities both in Asia as well as Europe.



EUTELSAT 172B has been built with innovative features such as the flexibility to dynamically distribute beam power, robotic arms for orbital control, and parts made using 3D-printing. PHOTO: AIRBUS SPACE & DEFENCE

State-of-the-art 172B to boost APAC coverage

Preparations are under way to launch *EUTELSAT 172B* to the 172°E video neighbourhood which is said to provide "exceptional Asia-Pacific reach over land and sea, from Alaska to Australia".

With a launch weight of just 3,500kg and electric power of 13kW, the satellite is due to lift-off from French Guiana on 25 April. It will provide service continuity and improved performance via C- and Ku-band payloads connected to a range of footprints.

Manufactured by Airbus Space and Defence, *EUTELSAT 172B* is the first European-built all-electric satellite.

It is said to incorporate several "state-of-the-art" features. For instance, it has structural components made using 3D-printing techniques that reduce the cost and time required to build spacecraft parts.

The satellite also has the flexibility to dynamically distribute power between the 11 elliptical beams in its high

throughput payload in direct response to capacity surges on-board aircraft.

In addition, *EUTELSAT 172B* will use robotic arms to orientate and control thrust direction during the approximately four-month ride to geostationary orbit, and for station-keeping during its minimum 15-year life.

The new satellite is expected to enter service during the third quarter of this year, replacing *EUTELSAT 172A* which will be relocated.

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Roshan uses satellite for backhaul support in Afghanistan

Roshan has upgraded its cellular backhaul network to support 3G services over satellite in south-western Afghanistan.

Under a multi-year service agreement, the telco will use SpeedCast's *CelCast* backhaul suite of solutions in the province of Zabul. It's claimed these are designed to optimise satellite traffic in telecoms environments, thereby lowering TCO and bringing "unrivalled quality of service".

The deal with Roshan represents SpeedCast's first 3G backhaul service deployment in Afghanistan. CEO PJ Beylier says: "With the upgraded network, operators like Roshan can provide new and better service offerings to end users by providing reliable and scalable connectivity. Once customers have access to better connectivity, it inevitably leads to a rapid increase in bandwidth demand."

Beylier reckons the new backhaul network over satellite will also allow operators to explore and develop new business opportunities and revenue streams, such as offering broadband and managed network solutions to banks, governments and home users using VSAT.

Since being established in 2003, Roshan has invested around USD700m in Afghanistan, and is said to be the country's single largest investor and taxpayer, contributing approximately six per cent of the government's overall domestic revenue.

The company is now Afghanistan's leading telecoms provider, with more than 6.5 million active subscribers across 287 districts and cities in all 34 provinces across the country.

In addition, Roshan directly employs around 900 people, 20 per cent of whom are women, and provides indirect employment to more than 35,000 people.

Telkomsel unveils Pre5G network in Indonesia

Indonesia's Telkomsel has commercially launched its Pre5G networks following successful deployments in Makassar, the capital of Sulawesi, and Manado, a popular tourist destination.

Using the 20MHz commercial spectrum in Band 3, it's claimed the networks achieved a single-user peak downlink rate of 398Mbps – 2.6 times higher than the current network rate. At a press event held in December, Telkomsel demonstrated online playback and high-speed download of 4K HD video.

The operator's network in Sulawesi includes more than 10,000 logical sites which support more than eight million mobile users.



As part of a modernisation process that paves the way to 5G, Telkomsel is now working to deploy commercial Pre5G networks in more cities.

Telkomsel said its launch is part of a network modernisation process that paves the way to 5G.

The company is now working with its longstanding partner ZTE to deploy commercial Pre5G networks in more

cities. It says the aim is to "greatly enhance" customer experience and network capacity by using key Pre5G Giga+ MBB technologies, such as 4x4 MIMO and 256 QAM, as well as flexible X-Site networking.

Liang Weiqi, the vendor's sales manager in Indonesia, says: "ZTE's Pre5G technology will bring users a network rate higher than 1Gbps, as well as new services and technologies, such as 4K HD video, virtual reality, augmented reality and IoT, thus accelerating the network modernisation process in Indonesia."

This latest launch of Pre5G follows ZTE's live demonstration of its equipment in Malaysia last year (*see News, Q4 2016*).

NDC launches new DTH platform on ABS-2

Nepal Digital Cable (NDC) has signed a multi-transponder agreement with ABS for the delivery of DTH services in the country.

NDC's new service started in February 2017 and uses the South Asia Ku-band beam on ABS-2 which covers Nepal and neighbouring countries from 75°E.

"Our subscribers will enjoy more than 170 high-quality channels, including around 50 HD as well as three UHD or 4K channels, the

first in Nepal," says Laxmi Prasad Paudyal, MD, NDC. "Our goal is not to meet the competition but go way beyond it and set a new milestone in the Nepalese pay TV industry."

Nepal Digital Cable is a joint venture between Gospel Digital Technology, Shenzhen China and various Nepalese entrepreneurs. Its DTH platform is said to be the country's biggest, and the company is also expanding its services to digital cable and high-speed broadband.

ABS-2 was launched in 2014 and is said to be one of the most powerful satellites in the eastern hemisphere, delivering more than 12kW of payload power with 89 transponders. It was built by Space Systems/Loral and is claimed to have the capability to provide services for 60 per cent of the world's population.

NDC joins other broadcasters in Indonesia, Russia/CIS, South Asia, Bangladesh and Africa who are also using ABS-2 to deliver DTH services.

Partners aim to capitalise on India's IoT

Reliance Group, Unlimit and Cumulocity have teamed-up to deliver IoT solutions in India.

Set up by the Reliance Group, Unlimit is said to be India's only dedicated IoT business unit, and its sole focus is on solutions for enterprise users.

Under their strategic partnership, Unlimit plans to extend its connectivity offering using Cumulocity's open, IoT software platform. It's claimed the combined offering will give customers a number of benefits, such as: rapid machine, sensor and device integration; data collection and normalisation; real-time analytics for condition

monitoring; amongst others.

Citing recent analyst reports, Unlimit says India's IoT is forecast to grow at a CAGR of 28 per cent over the next five years, which may result in "technological leapfrogging" of more established economies.

"With the number of connected devices in India projected to rise from 200 million today to three billion by 2020, nearly every part of the economy will be positively impacted by IoT," says Unlimit CEO Jürgen Hase.

The company adds that early benefits are already anticipated in many sectors such as transport, healthcare, agriculture, utilities, etc.



Unlimit CEO Jürgen Hase in an IoT concept connected rickshaw. It's equipped with a GPS tracker and an emergency button that triggers SMS, email or voice calls to the local police.

Mumbai gets carrier-neutral exchange

AMS-IX (Amsterdam Internet Exchange) and India-based ICT service provider Sify have launched a carrier-neutral, open internet exchange in Mumbai. It's claimed customers will be able to connect to the new AMS-IX India via dedicated ports with multiple speeds of 1Gbps or 10Gbps.

Mumbai was picked as the initial location for the exchange as it is seen as India's internet gateway and also gives accessibility to some of the country's largest data centres. By connecting to the IXP, it's claimed content providers and ISPs will be able to exchange internet traffic and benefit from reduced latency and costs.

Sify has a unified license to operate national/international long distance and ISP services, and offers VoIP backhaul for international carriers. Its data network infrastructure is said to reach more than 1,400 cities and towns in India, and currently connects 43 data centres in the country, including the company's six Tier 3 facilities across Chennai, Mumbai, Delhi and Bengaluru.

Sify chairman Raju Vegeesa says: "We believe the exchange will create the right ecosystem for acceleration of internet adoption in India and will support the Digital India initiatives. The open nature of AMS-IX India will provide all content and internet service providers a truly global standard."

U Mobile deploys direct carrier billing

Malaysian celco U Mobile has partnered with m-commerce enabler DOCOMO Digital to give customers the option of purchasing Google Play store content using direct carrier billing.

Through direct carrier billing, subscribers are invoiced for digital and physical goods directly through their phone bills.

DOCOMO Digital says it will provide a range of customer care tools for consumers, ensuring they have full visibility of carrier billing

Partnership to create smart cities in Thailand

Thailand's state-owned CAT Telecom will work with South Korea Telecom on the deployment of IoT networks in Phuket and Bangkok. They plan to provide residents and visitors with diverse and innovative IoT services from April 2017.

Under an agreement signed in early February, the two operators will deploy LoRa-based IoT networks in central areas of the capital as well as the entire Phuket Province.

As part of its digital economy policy, the Thai Government is focusing on Phuket as its first smart city project. Here, SK Telecom and CAT will first launch a vehicle location tracking service followed by smart services for metering and street lighting.

The companies will also roll out LoRaWAN in central areas of Bangkok and offer an IoT-based location tracking service for tourists. In particular, they say the service is expected to prevent people, especially children and the elderly, from going missing near the Grand Palace, where a large number of mourners are visiting to pay their respects to the late King Bhumibol Adulyadej who died last year.

CAT Telecom CEO Sanpachai Huwanandana described SK Telecom as a global IoT leader, and said they will successfully carry out the government project and deliver the first IoT service in Thailand.

Cha In-hyok, EVP and head of IoT business division of SK



Left: Cha In-hyok, EVP and SK Telecom's head of IoT business division. Right: Sanpachai Huwanandana, CEO, CAT Telecom.

Telecom, added: "SK Telecom will contribute to the growth of the ICT industry in Thailand by working together with CAT Telecom in the area of IoT, while nurturing a new ICT ecosystem by cooperating with many related companies."

Mahindra Comviva develops new mobile learning platform aimed at enterprises

Mahindra Comviva has launched a new smartphone-based learning and development platform aimed at corporate users.

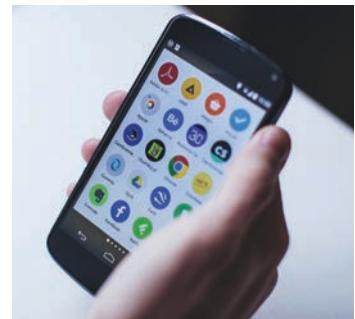
The company reckons that until now, mobile and e-learning solutions have been limited due to the inability to provide effective learning content that matches the lifestyle of learners. It claims *PalmLeaf* addresses various challenges by providing an "integrated and comprehensive m-learning solution that comes with cutting edge features".

These include patented 'FlashLeaf' technology which, according to Mahindra Comviva, provides user engagement, multiple learning methodologies such as social learning, and an intuitive and immersive user experience. "While other m-learning solutions have mobile as a support function, *PalmLeaf* has mobile content at its core," states the firm.

It adds that *PalmLeaf*'s m-learning platform along with its "uniquely designed" bite-sized content optimises employee training and

productivity costs by converting staff idle time into learning opportunities. It claims this improves course completion rates by 67 per cent.

Mahindra Comviva has partnered with Tata group company Vistara to roll out *PalmLeaf* to its employees. Roli Singh, head of talent development at Vistara, says: "M-learning provides us with an intuitive and interactive learning platform along with content that is designed for mobile phone screens, creating a win-win scenario for the company as well as the learners."



By providing full end-to-end services, DOCOMO Digital says it has helped U Mobile customers become part of the digital economy.

transactions charged to their mobile account. The company adds that for U Mobile, the deal is more than just enabling a new way for customers to transact through mobile devices – it reckons the solution will accelerate new revenue streams in m-commerce and Big Data.

U Mobile will use DOCOMO Digital's full payment enabler platform. This has been designed to connect management tools, business intelligence, marketing, reporting and

CRM capabilities into the operator's systems, enabling it to gain insight and transparency of end user behaviour.

"Introducing new payment methods like direct carrier billing goes much further than simple technical integrations," says Hiroyuki Sato, CEO, DOCOMO Digital. "By providing full end-to-end services we've helped U Mobile customers become part of the digital economy."

DOCOMO Digital is part of Japan's NTT DOCOMO and NTT Group.

First LTE-A in Pakistan

 Wi-tribe has signed a USD15m deal and strategic partnership with Huawei to upgrade its LTE network in at least five cities across Pakistan including Islamabad, Rawalpindi, Lahore, Karachi and Faisalabad. As part of its USD50m investment plan, the WISP is already said to be piloting the country's first LTE-A deployment. It has installed 4.5G supported hardware at its head office in Islamabad, and following successful tests it aims to roll out the technology across the city.

BSNL to ditch 2G?

 State-owned Indian telco BSNL reportedly plans to replace all its 2G base stations with 3G. According to local media, it will install around 28,000 new BSTs that can support 3G and 4G by the end of next year. BSNL has announced it will use part of its 3G spectrum to launch 4G services. Nokia is currently said to be the lowest bidder for the implementation followed by ZTE. The company is also planning around 28,000 new 3G and 4G capable BSTs as part of an expansion plan that is expected to be completed by 2018.

MCT cable goes live

 Following six years of work, the Malaysia-Cambodia-Thailand (MCT) subsea cable system has now gone live. The 1,300km cable system uses 100Gbps technology and will connect to other underwater cable networks such as the Asia-America Gateway. The consortium behind the MCT includes EZECOM from Cambodia, Telekom Malaysia and Thailand's Symphony Communication. They claim the system will add at least 30Tbps of capacity across the three countries, and enable more robust internet connectivity.

EpicNG coverage extended as IS-33e begins service

Intelsat has now gone live with what it claims to be the first multi spot beam, Ku-band, high throughput satellite (HTS) service for the APAC, EMEA, Indian Ocean and Mediterranean regions.

Intelsat 33e was successfully launched last August and is the second satellite to use Intelsat's *EpicNG* high throughput system (see *News*, Q3 2016). It was due to enter service at the end of last year but this was delayed due to a malfunction in the primary thruster which meant orbit raising took longer than originally planned. The satellite eventually entered service on 29 January 2017.

Manufactured by Boeing, *Intelsat 33e* is said to be equipped with the "most advanced" HTS payload design that is also "exceptionally flexible". From its orbital location of 60°E, Intelsat

says the new spacecraft will enable the delivery of enterprise-grade, broadband services to fixed and mobile network operators, aeronautical and maritime mobility service providers, and government customers.

Some of the customers committed to *Intelsat 33e* across its vast geographic coverage include Pakistani ISP SuperNet, African operators such as Orange Cameroon and Vodacom, Russian network service providers Romantis and RuSat, maritime broadband specialists GEE, Speedcast and Marlink, amongst others.

Intelsat's first satellite to use its *EpicNG* HTS system was *29e* which went live with services for the Americas in March 2016. The company says its *EpicNG* global footprint will be



Intelsat 33e was successfully launched last August but its commercial launch was delayed.

completed with additional launches over 2017-18. This includes *Horizons 3e* which is due to go up to 169°E in the second half of next year to expand Intelsat's HTS coverage in APAC.

Intelsat and OneWeb combine – Wireless Business, p13

Telkomsel boosts footprint over Indonesia

Arianespace has successfully launched the third satellite for Telkom (Telekomunikasi Indonesia), Indonesia's biggest telco.

Telkom-3S left Earth on board flight VA235 from Arianespace's spaceport in Kourou, French Guiana on 14 February. It is currently undergoing tests at 135.5°E. After passing, it will be moved to 118°E where it will

replace *Telkom 2* which was launched in November 2005 and built with an expected lifespan of 15 years.

The USD215m spacecraft's payload includes 32 C-band transponders, including eight extended C-band, as well as 10 for 10 Ku-band. It will provide HD TV broadcast services along with faster mobile and internet applications across the country's

more than 17,000 islands.

Built by Thales Alenia Space and based on its *Spacebus 4000B2* platform, *Telkom-3S* has a lifespan of 17 years and will cover parts of neighbouring Malaysia as well as Indonesia.

Prior to the launch of the new satellite, Telkomsel says it was experiencing a capacity shortage and was leasing transponders from other countries.

Huawei India helps promote ICT education

Huawei Technologies India will provide scholarships to 80 students as part of its programme to contribute to the development of ICT skills in the country.

The company has signed an MoU with eight leading engineering universities and colleges. Huawei says its 'Excellence Scholarships' will be awarded to "meritorious and deserving" students. Each will receive around INR50,000 (USD763) to cover the annual cost of college fees.

William Zhao, CEO of Huawei Technologies India, says ICT skills is one of the keys to the spread of new technologies and narrowing gaps in societies and regions. He says: "We believe that a large base of highly skilled youth can galvanise the advancement of industry and



Huawei Technologies India CEO William Zhao (right) says a large base of highly skilled youth can "galvanise" society's advancement. Also pictured is IIIT-B founder and director, Prof. S. Sadagopan.

society. Our partnership with Indian universities will enable students to excel in ICT knowledge and skills, paving the way for an enriching career and their contribution to the industry and society"

The eight institutions include: the M S Ramaiah Institute of Technology; Sri Jayachamarajendra College of Engineering; International Institute of IT – Bangalore (IIIT-B); University Visvesvaraya College of Engineering; Bhusanayana Mukundadas Sreenivasaiah College of Engineering; National Institute of Technology Karnataka; PES University; and CMR Institute of Technology.

Huawei says it has always supported ICT education in countries where it operates. India hosts its largest overseas R&D Centre which was established in Bengaluru in 1999. The facility develops VAS, BSS, OSS, e-commerce, terminal device software, as well as software for Big Data, cloud, NFV, SDN, IoT and storage.

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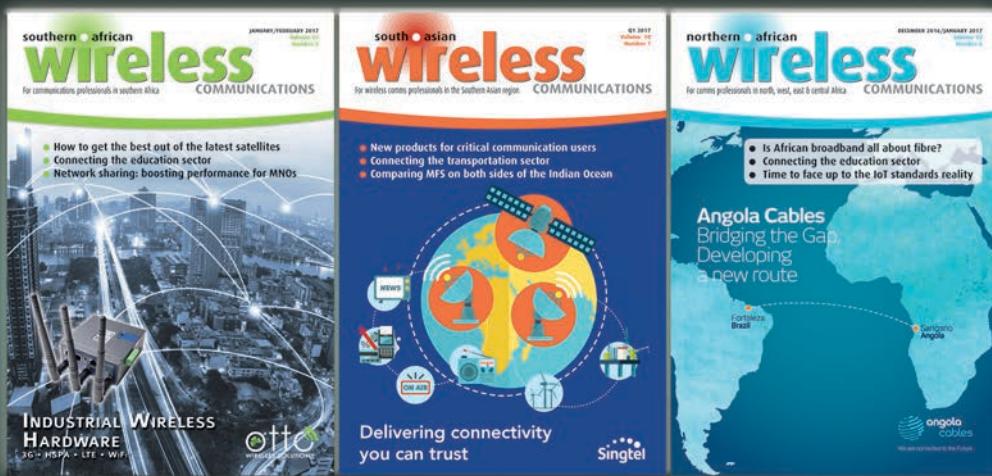


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Singtel, your one resource for all satcoms needs

Singtel is more than just a satellite operator. As a leading communications and ICT solutions provider in Asia, Singtel leverages on our extensive submarine cable networks and data centres facilities and harnesses Infocomm Technology to offer a fully integrated and customised suite of Satellite services to customers in various industries such as broadcasting, banking, energy, government agencies and maritime.

We own three teleport in Singapore which point to more than 30 satellites and are supported by an extensive terrestrial network of more than 200 PoPs in over 160 global cities. Our terrestrial infrastructure is upgraded regularly so that our customers can always enjoy the best services and coverage. We have established a satellite footprint that covers Asia, Middle East and Africa regions. Our strong partnership with Inmarsat and Iridium allows us to provide our customers with reliable mobile satellite communications using BGAN and satellite phones.



Enterprises looking for reliable connectivity in Asia and Africa regions can look to ST-3 which delivers high powered C-band coverage. With high performance east and west hemi beams of ST-3, it provides powerful connectivity to support transponder lease, VSAT, SAT-IP services and many more. Besides C-band beam, our high powered Ku-band beam allows enterprises to serve remote customers in the Southeast Asia region with unparalleled connectivity.

Businesses today need innovative, customised solutions that drive productivity and enhance operational efficiencies. Being a satellite ICT service provider, besides providing reliable satellite connectivity, our value-added services have been well-received by customers. For example, shipping companies experiencing costly communication at sea and finding it difficult to manage due to lack of IT expertise onboard can look to Singtel AIO (All-In-One) Smartbox and mobile app to address their issues. Singtel All-In-One ("AIO") SmartBox is a centralised management box installed on board vessels for remote monitoring and control. Singtel Mobile App provides fast and easy access to contact list and multi-media messaging; and importantly, it overcomes the challenge of high communication cost.

For enterprises facing increasingly complex and persistent cyber-security threats, the need to have cyber security protection is

critical as disruptions from hacking and viruses via satellite transmission can have potentially damaging effect to companies. The acquisition of US-based Trustwave, a leading specialist in managed security services has strengthens our global cybersecurity capabilities in North America and Asia Pacific region. Enterprises will benefit from Trustwave's three main areas of services - threat intelligence, vulnerability management and compliance management which are delivered through the unified cloud-based Trustkeeper® platform, helping enterprises to protect their IT infrastructure, applications and networks.

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Aircel and RCOM in “largest-ever” telecoms sector consolidation

Indian MNOs Aircel and Reliance Communications (RCOM) have merged in what's described as “the largest-ever” consolidation in the country's telecoms sector.

Aircel was acquired by Malaysian telco Maxis Communications Berhad (MCB) in 2006. The company said it has so far invested more than INR35,000 crore (USD5.2bn) into the operation, making it one of India's biggest overseas investors.

RCOM and MCB will each hold a 50 per cent stake in the merged company which will be managed by an independent professional team under the supervision of the board.

This latest deal for RCOM follows its acquisition of SSTL's wireless business in 2015 (*see Wireless Business, Q4 2015*).

The operator said the merged company will be one of India's largest private sector companies with an asset base of more than INR65,000

crore (USD9.7bn) and a net worth of INR35,000 crore (USD5.2bn).

It will also join Airtel, Vodafone and Idea Cellular to become one of the country's top four operators by customer base. According to the Telecom Regulatory Authority of India, as at the end of December 2016 Aircel had 8.06 per cent share of India's 1,127.37 million subscribers while Reliance had 7.68 per cent. This makes them the country's fifth and sixth biggest MNOs respectively by subscribers.

In addition, it's claimed the new company will have the second-largest spectrum holding amongst all operators, aggregating 448MHz across the 850, 900, 1800 and 2100MHz bands. RCOM said subscribers will also benefit with access to nationwide LTE services on the sub-1GHz band under its existing spectrum sharing/inter-circle roaming arrangements with Reliance Jio Infocomm.

In December, RCOM separately announced that it had signed binding agreements with Canada-based Brookfield Infrastructure in relation to the acquisition of its tower assets.

In a letter to its shareholders, Brookfield said: “We will soon be investing upwards of USD200m to acquire a portfolio of 40,000 telecommunication towers from Reliance Telecommunications, representing around 10 per cent of the country's towers.”

RCOM will receive an upfront cash payment of INR11,000 crore on completion of the transaction. It will also receive class B non-voting shares in the new tower company, providing 49 per cent future economic upside in the towers business, based on certain conditions.

It's claimed the transaction will represent the largest-ever investment by any overseas financial investor in the infrastructure sector in India.

RCOM's telecom towers will be demerged into a separate new company that will be 100 per cent owned and independently managed by Brookfield Infrastructure, thereby creating what's said to be the second-largest independent and operator-neutral towerco in India. RCOM and Reliance Jio will continue as major long-term tenants of the new firm, along with other existing third-party operators.

RCOM added that it will use the upfront cash payment solely to reduce its debt. It said the merger with Aircel and the monetisation of the tower business will together reduce its overall debt by INR31,000 crore (USD4.6bn) or nearly 70 per cent of existing debt. Aircel's debt will reduce by INR4,000 crore (USD600m) following the merger.

Both transactions are subject to approvals.

Vodafone and Idea Cellular to merge in India – News, p5.

Telenor quits India

Telenor has entered into a definitive agreement for Bharti Airtel to take full ownership of its operations in India. The announcement, made in late February 2017, means that the Norwegian operator is quitting India after nine years. The financial details of the transaction have not been disclosed.

Telenor Group CEO Sigve Brekke said: “The decision to exit India has not been taken lightly. After thorough consideration, it is our view that the significant investments needed to secure Telenor India's future business on a standalone basis would not have given an acceptable level of return.”

Telenor's operations and services will continue as normal until

completion of the transaction which is subject to requisite regulatory approvals and is expected to close within 12 months.

Telenor added that the transaction will not trigger any impairment. As of 4Q16, it said the remaining value of tangible and intangible assets in Telenor India amounted to NOK0.3bn. As part of the agreement, Airtel will take over outstanding spectrum payments and other operational contracts, including tower lease.

Airtel is India's largest wireless operator with more than 269 million subscribers and a revenue market share of more than 33 per cent. As the new owner, Airtel said it will

“seamlessly integrate” Telenor India's spectrum, licenses and operations, including its employees and 44 million customers.

Intelsat and OneWeb combine

Intelsat and OneWeb have agreed to merge in a share-for-share transaction. SoftBank Group (*also see Investments, mergers & acquisitions table, below*) has also agreed to invest USD1.7bn in newly issued common and preferred shares of the combined company.

Both the merger and the SoftBank investment are subject to, among other conditions, successful completion of debt exchange offers to certain existing Intelsat bondholders as well as receipt of certain regulatory approvals.

The debt exchange offers together with the proceeds of the SoftBank investment are intended to reduce Intelsat's debt by around USD3.6bn, assuming the minimum level of participation in the debt exchange offers is achieved.

Either party can terminate the agreement and SoftBank can terminate its investment if the debt exchange offers have not been successfully completed within 90 days of the date of the agreement which was announced on 28 February 2017.

“As an early equity investor in OneWeb, we recognised a network that was a complement to our next-generation EpicNG fleet and a fit with our long-term strategy,” said Intelsat

INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
19/12/16	SoftBank Group	OneWeb	40% stake	USD1bn	The Japanese technology giant has become the biggest stakeholder in OneWeb which is now estimated to be worth USD2.5bn. Softbank founder Masayoshi Son has reportedly told US president Donald Trump that he will put USD50bn into US businesses & create 50,000 jobs over the next four years.
21/12/16	Brookfield Infrastructure	Reliance Communications	40,000 towers	USD1.6bn	RCOM's towers will be de-merged into separate company that will be 100% owned by Canada-based Brookfield Infrastructure. Transaction is claimed to represent largest ever investment by any overseas financial firm in India's infrastructure sector. RCOM will receive Class B non-voting shares in the new towerco, but will not be involved in its management.

CEO Stephen Spengler. "By merging OneWeb's LEO satellite constellation and innovative technology with our global scale, terrestrial infrastructure and GEO satellite network, we will create advanced solutions that address the need for ubiquitous broadband."

USD2bn to go into Myanmar's fourth network

The Myanmar National Tele and Communications Company will invest a total of USD2bn after winning the license to become the country's fourth MNO.

The company is a joint venture between Myanmar National Telecom Holding (MNTH), Star High and Viettel Global, the telco owned by Vietnam's military. It was granted a 15-year telecom service licence by the country's Transport and Communications Ministry last year.

The partners officially signed their joint venture contract in September and received their investment license in January 2017. Of the USD2bn that will go into Myanmar's fourth network, Viettel's share is 49 per cent, Star High's is 28 per cent and MNTH's is 23 per cent.

The consortium will run its mobile operation under the "Mytel" brand, and has set itself the goals of starting operations after 12 months and covering 95 per cent of the population within three years.

Myanmar represents Viettel's tenth international market, and with 60 million people, it is also the one with the largest population.

The company boasts that with its long and profitable experience of doing business in the international market, it will be able to "take on the existing rivals in Myanmar with "confidence".

"When we start operating in any

market, our network must be better than the strongest competitor's," said Le Dang Dung, deputy general director, Viettel Group. "We promise to build a modern and extensive telecom network covering the whole of Myanmar, and we will try to complete it very soon."

The Myanmar investment is part of the Viettel Group's general development strategy to expand its international markets, especially in developing Asian countries.

More sharing for M1 and StarHub?

Singapore's M1 and StarHub have signed an agreement to look at sharing more of their mobile infrastructure sharing.

For many years, the two operators have been sharing infrastructure through mutual cooperation, including the combined antenna systems, in-building fibre and tunnel cables.

Under an MoU signed in January 2017, the companies will now focus on sharing RAN, backhaul and access assets. It's claimed this will enable them to optimise use of certain network elements, and improve network coverage and capacity for the benefit of their respective customers. Network traffic will continue to be managed independently by the companies.

StarHub CEO Tan Tong Hai said: "We are cooperating to bring the Singapore infocomm industry to the next level, to compete not on pure infrastructure ownership, but at a higher level of customer service and innovative value creation.

Sharing mobile network radio elements with M1, but keeping our individual mobile core networks, will allow StarHub to provide better mobile service (in particular, mobile coverage) and still be able to differentiate ourselves."

M1 CEO Karen Kooi added that further network sharing will lower opex and capex for both operators. She said this will allow each company to run its existing mobile services efficiently and still be able to invest in future technologies.

Cataleya in management buyout

A joint management team has acquired Cataleya from Singapore-headquartered Epsilon Global Communications group. Financial details have not been disclosed.

The team includes technology startup accelerator Incipio and a group of R&D and engineering specialists. It was led by Andreas Hipp who co-founded Epsilon in 2003 and was the former CEO of both Epsilon and Cataleya until October 2015.

Cataleya specialises in IP networking and in developing and deploying next-generation carrier grade switching systems. Under its new ownership, it's claimed the company will be able to push intelligent networking applications and services into new areas and develop new commercial models for next generation session border controller (SBC) technologies.

"Epsilon Global Communications made the strategic decision to focus on its core service provider offering," said Epsilon CEO Jerzy Szlosarek. "The timing was right to dedicate ourselves fully to innovating within our Cloud-centric networking platform."

Hipp becomes Cataleya's chairman and CEO and will oversee its global operations. The company will maintain its Silicon Valley-based R&D facilities and headquarters in Singapore while expanding its operations in Pune, India.

In the coming months, Cataleya plans to make announcements around features and functionalities

related to NFV, cloud and UCaaS (Unified Communications as a Service) in addition to its machine learning-based fraud identification and mitigation capabilities.

Airbus taps into Indian market for mission-critical comms

Airbus has signed a value-added reseller agreement with Trimax IT Infrastructure and Services to support the growth of its PMR (professional mobile radio) solutions in India.

Trimax provides IT services across the country in areas including connectivity, data centres, cloud services and system integration. The company is also a provider of industry-specific solutions in sectors such as transportation.

Jens Thostrup, head of marketing and business development at Airbus' Secure Land Communications division, said the company hopes to create a "buzz" in the Indian market for PMR-based solutions such as TETRA. He added that the agreement with Trimax is key for Airbus to make significant inroads into the Indian PMR market: "The company has a large customer base across the country with the kind of customers we wish to address and we see great synergies," said Thostrup.

Trimax chairman and MD Surya Prakash Madrecha believes that with Airbus' PMR portfolio, his company will be able to provide Indian PMR customers with some "unique and very innovative" solutions.

Tech Mahindra and CyanConnode push narrowband

Tech Mahindra and CyanConnode have agreed to deliver, sell and deliver narrowband mesh technology in key markets. Under an MoU signed in February, the two companies aim to

NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
21/12/16	Thomas Van den Driessche	Newtec	CEO	Newtec	CCO. Replaces Serge Van Herck who has resigned.
5/1/17	Herbert Merz	Radio Frequency Systems	President & CEO	Coriant	President
18/1/17	Arun Sarin	Mobileum	Board director	Vodafone Group	CEO
24/1/17	Augusto Argento	Neural Technologies	Director of partners & channels	GM, revenue intelligence	HP Communications & Media Solutions
24/1/17	David Kagan	SpeedCast	COO	Globalstar	President & COO
24/2/17	Steve Collar	SES	Executive committee member	-	Has been appointed in his capacity as O3b CEO.
14/3/17	Deepak Mahajan	Sicap India	Executive director for India & South Asia	Lava Mobiles	VP

target the smart grid, smart city and IoT markets. As part of the collaboration, Tech Mahindra will integrate CyanConnode's enterprise-level *Head End Software (HES)* with its meter data management systems and enterprise business applications to create an end-to-end utility specific solution.

CyanConnode executive chairman John Cronin said: "This collaboration is a further step towards a managed

services business model, which will deliver a recurring revenue stream from software licenses and support services."

Airtel and Millicom merge in Ghana

Millicom and Airtel have agreed to combine their operations in Ghana. The financial terms of the agreement have not been disclosed, but each company will have equal ownership and governance rights in the merged entity.

It's claimed the combination of Millicom's Tigo operation in Ghana with Airtel's local subsidiary will cover more than 80 per cent of the population with high speed data, providing the widest 3G coverage across the country. It will have revenues of just under USD300m and a 25.93 per cent market share, making it Ghana's second biggest mobile voice operator.

Millicom and Airtel expect the integration of their networks to provide customers with a "major boost" in both rural and urban network coverage.

They add that their combined fibre footprint and increased data centres will also give enterprise customers access to a diverse portfolio of "world class" solutions. Mobile financial services will also be enhanced with combined agent networks and platforms.

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
24/1/17	M1	Singapore	FY16	SGD	806	311.92	5.9	Service revenue down 2.0% as traditional services continued to be impacted by OTT.
1/2/17	RSCC	Russia	FY16	RUB	11.4 (bn)	NA	NA	Revenues up 24 per cent compared to 2015's RUB9.2bn. 40% came from international earnings. Entered Latin American in 2016, & "significantly expanded" customer base in South Africa through provision of backbone links, corporate applications & services to MNOs.
2/2/17	Motorola Solutions	US	FY16	USD	6,038	NA	3.17	YoY sales increased 6%. Growth of 33% in Europe, Middle East & Africa region driven by Airwave sales in the UK.
2/2/17	Telenor	Norway	FY16	NOK	131,427	46,483	1.89	1.1% organic growth YoY primarily driven by rapidly increasing data consumption in Pakistan, Bangladesh & Myanmar. Organic revenue growth in range of 1% to 2% & EBITDA margin of around 36% expected in 2017.
3/2/17	Starhub	Singapore	FY16	SGD	2.4 (bn)	690.1	NA	YoY mobile revenue decreased 2% to SGD1.2bn. Post-paid ARPU remained at SGD70 while pre-paid ARPU was lower by SGD2 and is currently at SGD16.
9/2/17	Eutelsat	France	1H16	EUR	755.1	588	NA	Revenues down 0.9% YoY but in line with expectations. Upcoming joint-venture with ViaSat paving the way for future growth in connectivity from 2020s. Secured Ka-band capacity from Yahsat to enable launch of African broadband initiative (<i>Konnect Africa</i>) later in 2017.
9/2/17	Infinera	US	FY16	USD	870.1	NA	(0.17)	Fall in GAAP revenue compared to USD886.7m in 2015. CEO Tom Fallon said "product transition is currently holding back revenue growth" but believes results will improve in 2017 following launch of next gen ICE4 products.
9/2/17	Singtel	Singapore	3Q16	SGD	4,410	1,221		Operating revenue down 2% due to mandated cuts in Australian mobile termination rates. Indonesia: Telkomsel's pre-tax profits up 31%; India: Airtel's pre-tax profits fell 27%; Thailand: AIS' earnings affected by higher amortisation charges as well as higher costs incurred through leasing of 2100MHz spectrum & equipment from TOT; Philippines: Globe's earnings increased on stable revenues & "tight" cost management.
14/2/17	Gilat Satellite Networks	Israel	FY16	USD	279.6	19.2	NA	Revenues up 42% from \$197.5m in 2015; growth driven by broadband & in-flight connectivity. Aiming for 2017 revenues of between USD280m to USD300m & adjusted EBITDA of around USD20-24m.
15/2/17	Cisco	US	2Q17	USD	11.6 (bn)	NA	0.47	Total revenue was down 2%, with product revenue down 4% & service revenue up 5%. Revenue by geographic segment was: Americas down 3%, EMEA flat, & APJC down 3%.
23/2/17	Axiata Group	Malaysia	FY16	MYR	21.6 (bn)	8.0 (bn)	0.05	8.5% YoY growth from MYR19.9bn reported in 2015. But PAT impacted by currency depreciation & forex issues, acquisition of Ncell in Nepal, & "aggressive" competition in India .
24/2/17	SES	Luxembourg	FY16	EUR	2,068.8	1,451.5	1.34	2.7% YoY growth. Video is 68% of group revenue and grew 4.7% to EUR1,398.8m. In South Asia, SES-9 was brought into service in June 2016 to offer greater coverage across the region; announced multi-year, multi-transponder deal with Sky Cable for DTH in Philippines.
27/2/17	VimpelCom	Netherlands	FY16	USD	8,885	3,232	0.23	Delivered on all 2016 financial targets & returned to growth at 7.5%. Reported YoY revenues up 27.7% in Pakistan (primarily due to Warid consolidation from 3Q16), & 2.7% in Bangladesh. Company aims to re-brand as 'VEON', subject to shareholder approval in March 2017.
28/2/17	Intelsat	US	FY16	USD	2,188	1,613.4	NA	15% YoY decrease in Network Services; 2% YoY decrease in Media revenues; & Government earnings flat. Forecasts FY17 revenue to be in a range of USD2.180bn to USD2.225bn.

Pioneering solution claims to cut PIM in cell networks

Hughes Electronics has developed what it describes as a "pioneering" new connection system to help

MANUFACTURER:
Hughes Electronics

PRODUCT: WaveWay

MORE INFORMATION:
www.hugheselectronics.co.uk

reduce passive intermodulation (PIM) in cellular networks.

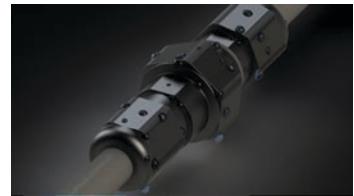
WaveWay is the result of work the company has been carrying out in collaboration with the London South Bank University.

Their investigations revealed that metal connectors are particularly vulnerable to PIM. Researchers found that the universally accepted multiple metal-segment design results in return signal paths and the creation

of multipath transmissions leading to 'ghost signals' and harmonics.

Moreover, Hughes Electronics says each conductive segment creates micro-separations in the transmission path forming intra-media signal transition points. This results in reflections, energy loss, distortion, arcing and capacitive junctions, all of which negatively interfere with legitimate signal transmissions.

WaveWay uses a single-piece forward



and return path mechanism. As a result, it's claimed separations are removed and signals constrained, severely restricting multiple-signal path opportunities and consequent PIM effects.

It is constructed from a non-metal composite material. This is claimed to create an isolation layer from energy fields while at the same time absorbing microphonic vibrations, resulting in significantly reduced PIM readings.

Emergency comms in 10 minutes with compact TETRA

The *Claricor Cell* from Airbus Defence and Space (ADS) is a compact communications network based on TETRA technology. The small system

MANUFACTURER:
Airbus Defence and Space

PRODUCT: Claricor Cell

MORE INFORMATION: www.securelandcommunications.com

has been designed to be quickly set up for vehicle convoys, firefighters or rescue operations in remote regions.

ADS says the fully equipped system works as a standalone solution, or can be easily integrated into existing national or smaller TETRA networks. There are several options for voice and data transmission when using the base station and the TETRA switch in *Claricor Cell*, including fixed line, IP radio link, LTE and satellite.

The system comes in rugged

boxes to enable easy transportation and works in rolling vehicles. ADS says it can be setup by end-users within ten minutes.

Claricor Cell has an IP65 protection rating against dust and water with the covers closed, and IP54 when it's in use. ADS says the tap-proof TETRA system is pre-configured and has a plug-and-play functionality.

Features and apps include individual and group calls, SDS, and status messages. A single switch system



also includes the following which are integrated in a rugged PC: RCS lite dispatching; MMI; set for parameterizing the radios; and element monitor.

IP modem transceives DVB-S2X with "utmost efficiency"

WORK Microwave reckons its *AX-60* platform provides the high performance necessary for IP trunking and IP network infrastructure applications.

The system includes modem, modulator, and demodulator options. By using the *AX-60*, the Germany-based satcoms equipment specialist claims operators can transmit and receive DVB-S2X signals with "utmost efficiency" and simplify operations. It says the platform is completely customisable



and scalable, and capable of adapting to any throughput, data analysis method and other waveforms beyond DVB-S2X.

By providing operators with a future-proof and flexible system for both standardised DVB-S2X and customised satcoms, WORK reckons the *AX-60* simplifies the transition toward an all-IP environment.

According to the firm, optimal use cases for the modem include high-speed network links over satellite, IP-based SNG, connection to and from LEO satellites for Earth observation, reception and analysis of satcoms, and more.

MANUFACTURER:
WORK Microwave

PRODUCT: AX-60

MORE INFORMATION:
www.work-microwave.com

VSAT services 'mimic' high-speed fibre at sea

Mission-critical communications specialist EMC (now part of Global Eagle Entertainment) has launched a new package of connectivity and content for ships at sea. The VSAT services leverage global Ku-band, and are said to be optimised for the latest next-generation high-throughput satellite (HTS) networks.

The package includes EMC's *SpeedNet* high-speed web browsing technology which works in the background on mobile and desktop browsers and is said to dramatically accelerate page load times.

Using a proprietary intelligent protocol and global backbone, EMC says *SpeedNet* predictively fetches, compresses and pushes multiple layers of websites at once to local servers. It claims the net result for the end-user is a browsing experience that mimics being on high-speed fibre.

In addition, EMC has launched a new back-end billing and account management platform that allows admin and crew networks to be managed separately from a single portal. Individual crew members can even transfer funds to mobile accounts of friends and family at home on more than 400 carriers in more than 100 countries.

The new service also includes live TV using a single satellite antenna on board and the same Ku-band network that delivers voice and data services.

MANUFACTURER: EMC

PRODUCT:
Marine VSAT services

MORE INFORMATION:
www.EMCConnected.com

F-Cell tech revolutionises small cell deployment

Bell Labs – which is now part of Nokia following its acquisition of Alcatel-Lucent – reckons it's come up with a "breakthrough" in small cell technology.

It says *F-Cell* eliminates the costly power and backhaul wires and fibres currently required for small cell installation, and enables "drop and forget" deployments anywhere. Bell Labs recently demonstrated the

MANUFACTURER: Nokia

PRODUCT: F-Cell

MORE INFORMATION:
<http://nokia.com>

world's first drone-based delivery of an *F-Cell* to a Nokia office rooftop in California (*pictured*). It says the unit wirelessly self-powered, self-configured, auto-connected to the network, and instantly began to stream HD video.

The system's architecture comprises a closed loop, 64-antenna Massive MIMO system placed in a centralised location. This is used to form eight beams to eight energy-autonomous (or solar powered) *F-Cells*. Bell Labs says each of these has been redesigned to require minimum processing power so that the solar panel is no larger than the cell itself.

In this way, the firm claims *F-Cell* technology sustainably solves today's small cell and backhaul cabling,



deployment and expense challenges for service providers and enterprises.

It adds that the architecture supports non-line-of-sight wireless networking in FDD or TDD mode, and the parallel operation of up to eight individual 20MHz channels allows for a system throughput rate of around 1Gbps over existing LTE networks.

Zebra APs boost network performance

Zebra Technologies has introduced two access points that promise to offer greater network performance, stronger customer engagement, and support for IoT applications.

By embedding dedicated sensors that collect data across the entire expanse of the network, the vendor

MANUFACTURER:
Zebra Technologies

PRODUCT:
AP8432 and AP8533

MORE INFORMATION:
www.zebra.com

says its new enterprise-class *AP8432* and *AP8533* access points deliver

actionable insights and secure connections in a cost-effective way. Zebra reckons the 802.11ac devices can deliver a "dramatically higher" density network with the sensors needed to measure, monitor and secure each connection.

Both APs include the company's *Triple Sensor Technology*. It says this can automatically protect against RF interference and security risks, push relevant contextual offers and services to consumers, and provide



strategic-shaping analytics. The technology integrates three sensors to monitor the network, Bluetooth, and RF spectrum. Unlike other sensors that can only scan part-time, Zebra says its dedicated dual-band sensor continuously scans for rogue devices.

In addition, the *AP8432* features built-in PoE-out, enabling it to connect to IP video cameras, wireless temperature sensors or any other third-party IoT network.

Wi-Fi workflow solution for field technicians

The *WaveGuide* app from software defined monitoring specialist Mariner xVu aims to enable any field technician to quickly install and certify that a new Wi-Fi network will provide the best service.

MANUFACTURER:
Mariner xVu

PRODUCT: WaveGuide

MORE INFORMATION:
www.marinerxvu.com

Available on *Google Marketplace*, the app allows any field technician to perform four workflow functions: location testing and troubleshooting; optimal access point placement; home certification; and reporting and customer sign-off.

Mariner xVu claims the solution offers a number of unique features and benefits. For instance, it checks for interference, congestion and signal strength coverage around the premises, finding the best location for the AP placement. Using intelligent algorithms, the app analyses the

current configuration against ever changing environmental factors and interferences to recommend optimal configuration.

The company says a guided "drill-down" approach leaves little to no interpretation of the results by the service technicians. It adds that an intuitive user interface makes the process easy.

WaveGuide is also said to be self-healing, and service providers can continuously monitor the configuration and performance metrics of the Wi-Fi network.

ALSO LOOK OUT FOR

Interoperable 400GbE test system unveiled by Ixia and Viavi

Ixia and Viavi Solutions have publicly demonstrated the world's first interoperable system running bi-directional 400GbE line rate traffic with RS-544 FEC as currently defined in the IEEE 802.3bs draft standard.

According to the partners, leading network equipment makers are heavily investing in the development of ASICs and new intellectual property for the next generation of higher speed switches and routers to address growing bandwidth requirements.

They say robust test tools are needed throughout this development to identify potential bugs and eliminate ASIC and hardware re-spins, which waste human resources, increase development costs and delay time to market.

Ixia and Viavi demonstrated full interoperability of their independently developed MAC, PCS, and RS-544 FEC IP (including the critical FEC element that enables 400GbE error-free data packets to be carried over fibre links) on readily available hardware components.

Ixia says its full portfolio of network infrastructure test systems, including the 400GbE test system, offer the same send/receive capabilities on all speed ports, with packet lengths as small as 49B, which is smaller than the minimum Ethernet frame size. It is also capable of sending and receiving a single 400GbE line rate flow at any packet size.

Meanwhile, Viavi says its *Optical Network Tester* has been proven in lab evaluations of 100G components, and now has the industry's first 400G support to include FEC and PAM4 modulation.

As a result, the two firms say high-speed network providers now have a comprehensive, integrated platform for design, development, and validation of 400G technologies including CFP8 pluggable 400G optics.

Maintaining good contact



While LTE looks set to dominate the market for new PMR products in the coming years, there's still plenty of life in traditional critical comms technology, as SARA FREWEN finds out. Additional reporting by RAHIEL NASIR.

The worldwide critical communications products market is anticipated to be worth USD18bn by 2019, according to a report published by IHS in 2016. While economic constraints have forced public sector cuts in many countries, its analysts said they are seeing strong growth on a global scale.

The two largest market segments are command and control solutions, and licensed mobile radio (LMR) terminals, which together account for more than two-thirds of critical communications revenue.

Public safety applications continue to make up a major part of the critical communications industry, and IHS estimates that the installed base of public safety and security users make up 43 per cent of the PMR market.

It is this potential that is driving the established critical comms vendors to continually innovate and develop new products. For example, Motorola Solutions reckons it's come up with a "one-box" digital radio system that reduces setup time to less than 15 minutes.

DIMETRA Express is an expandable single site TETRA system that integrates base radios and a switch. Motorola says it was created in response to demand from customers and partners for a product that was easy to deploy and cost effective enough to be used for smaller projects.

The system is claimed to be lightweight and energy efficient, providing all the voice, SDS and telephony services users require in a small physical footprint. Motorola says engineering expertise is not required as it can be set up and configured by a *Windows* or *Android* laptop or tablet, and is then managed and operated through web-based applications and tools. It adds that just a single IP address is required which further reduces setup as well as ongoing maintenance costs, making it easier to integrate into an existing IT network.

Hytera unveiled two new products at PMRExpo that took place in Germany last November. They included the *PD985 DMR* handset which features single frequency repeater mode. According to the company, this enables

the device to use one slot to receive signals and another slot to transmit it in the same frequency in DMO mode to extend communication distance. It's also equipped with Bluetooth 4.0 which not only supports audio transmission but also programming, and 3W audio output with Hytera's new noise cancelling technology.

The *PD985* has a protection rating of IP68 to comply with the highest dust and waterproof standards, and Hytera says the radio will continue to function for up to four hours after submersion under water to a depth of up to two metres.

Other features include 'Smart Battery'. The vendor says this makes it easier to monitor battery life and charging time which is "dramatically" reduced. There's also support for 32GB Micro SD cards enabling recording of up to 576 hours of digital/analogue audio.

The *DIB-R5* outdoor unit was the second product Hytera launched. The company says this expands its family of TETRA 2/TEDS base stations with an outdoor version for

ACCESSNET-T IP radio systems. Designed to be very small and space saving, the unit can be fixed, for example, to a wall, radio mast or in a tunnel. Furthermore, Hytera says the *DIB-R5* has low power consumption, enabling deployment in areas with critical electrical power supply. The firm adds that it has an IP65 rating making it dust- and waterproof, and operates in temperatures ranging from -30°C to +55°C.

Earlier this year, France's Airbus Defence and Space demonstrated what it described as the "future of digital radio". It said that in the foreseeable future, authorities will increasingly share photos, videos and other multimedia files with each other for which they require the appropriate technology.

At the European Police Congress held in Berlin in February, Airbus revealed that it had developed a product portfolio that enables multimedia communication in a secure radio network. Speaking at the time, Markus Kolland, head of sales and programme delivery for Europe and Africa at the company's Secure Land Communications division, said the most important thing is for TETRA to continue to prevail and be expanded with broadband technology. "Existing and future investments in the radio network will therefore continue to be of value," he said.

Airbus' range of broadband products also integrates applications for smart end devices, such as the *Tactilon Dabat* secure Android smartphone that has a built-in TETRA radio device (*also see '4G or not 4G?' feature, Q4 2016 issue*). This will now feature *Stashchat*, an encrypted messenger and file-sharing application that supports voice communication. Airbus claims it is a more secure choice for critical comms users than publicly available messenger applications.

The company developed the app in conjunction with Heinekingmedia, a German-based digital signage and professional secure messaging specialist. It is one of several companies Airbus is currently working with as part of its new app development programme, *SmarTWISP*. This aims to create a new application ecosystem that addresses the daily needs of PMR users.

The LTE alternative

Although LTE has been on the critical comms agenda for some time, its market entry has been slow and protracted because of its numerous challenges, such as the cost of spectrum.

However, it is now emerging as a leading candidate for critical communications broadband networks. In addition, with the recent approval of the mission critical push to talk (MCPTT) voice standard as part of 3GPP Release 13, LTE has also become an attractive substitute for providing LMR-like voice services.

Thomas Lynch, critical communications research director at IHS Technology, says: "End-users from several sectors are already implementing LTE, and some have chosen it over TETRA or DMR. As well as public safety, this is occurring mostly in small and contained networks, often in remote locations, for example, oil and gas platforms and in mining operations."

IHS projects that this growing trend will have an effect on existing critical communications technologies, especially on LMR terminals and infrastructure. Lynch says the trend has been seen in developing regions such as Africa where it has been easier to 'leap over' technology generations rather than set up an LMR infrastructure beforehand.

The TCCA (TETRA and Critical Communications Association) believes that it is vital that mobile broadband services are provided to public safety users as soon as possible. "Solutions based on the currently available 4G LTE technology will provide staff with much needed applications and information in the short term," says the association.

However, it also points out that the inclusion of such functionality does not, by itself, make commercial cellular networks suitable for mission critical operation. As a result, the TCCA has some significant reservations about the use of commercial mobile broadband networks for public safety applications, and recently issued advice to governments who may be considering LTE for their emergency services networks (*see 'LTE: what's needed for critical comms users', overleaf*).

Pierre-Yves Roy, product business manager at Airbus' Secure Land Communications division, agrees that current 4G networks are not as yet ready for public safety users: "It will be quite some time before complete and mature LTE-based solutions become available as the standardisation process is not yet finalised. That means that a complete, mature and standard LTE-based solution will not be available before 2020."

Making it all work together

At the end of January, Airbus announced its *LTE4PMR* (*Long Term Evolution for Professional Mobile Radio*) project to develop a full-fledged mission critical broadband solution. It described this as an "accelerator" in the standardisation, development and implementation of the specific products and features required to meet the public safety sector's secure communications needs.



Above left: Hytera's recently launched *PD985* DMR handset features single frequency repeater mode. Above right: the *DIB-R5* extends the vendor's range of TETRA 2/TEDS base stations with an outdoor version for ACCESSNET-T IP radio systems.

Airbus has set up an R&D consortium with French telcos and universities, and says that a "substantial" amount of resources will be invested over a period of 27 months as part of *LTE4PMR*.

The project solution will offer what the firm says are "typical" PMR features, such as MCPTT, complex data, and video transmissions. It will also create the base station, core network and terminal chipset enabling the deployment of mobile broadband secure communication networks in various frequency bands.

The final results of *LTE4PMR* will be presented at the end of 2017. Airbus says they will consist of a "comprehensive and interoperable" set of mission-critical solutions leveraging commercial mobile broadband services as well as dedicated networks in the 400/450MHz and 700MHz frequencies.

Until then, many PMR specialists continue to develop and launch customised products that use current standards of LTE technology.

For example, France-based ETELM, believes LTE offers "excellent" options for high-speed data and use of mobile applications, and therefore has a "massive future" in the market. It has developed a range of 4G linked technologies, including TETRA, DMR and analogue base stations, which connect directly to any standard LTE core network without any gateways or specific interfaces.

Late last year, the company unveiled the *e-LBS*, a new eNodeB LTE base station which is claimed to have the longest reach ever developed for PMR 4G technology. "The *e-LBS* is a major breakthrough for our 4G linked solution and introduces our own LTE technology to the mission critical sector," says ETELM sales and marketing director Nicolas Hauswald. "The *e-LBS* will allow operators to boost their coverage areas from existing locations and make seamless calls between subscribers, and give the best of all technologies in a single network." He adds that the *e-LBS* uses LTE's multi-broadcast features to ensure the widest coverage area, including group calls which are essential to mission critical users.



Motorola Solutions' "one-box" *DIMETRA Express* is an expandable single site TETRA system that integrates base radios and a switch.

ETELM says it has developed a fully integrated approach to avoid, wherever possible, the limitations of the gateway approach. Hauswald claims the company's linked multi-technology solution is the only one in the market that is fully integrated to LTE.

"Our solution implements the LTE protocol stack in every base station, thereby allowing our radio sites to directly and seamlessly connect to the LTE backhaul. In the future all operators will use the LTE core network, so having the ability and flexibility to connect onto this industry standard network is important for inter-technology communications."



ETELM claims its e-LBS base station has the longest reach ever developed for PMR 4G technology.

Interoperability is seen as a crucial factor for many of the major PMR specialists working with LTE. For example, Airbus said the various products in its *Tactilon* system such as the *Dabat* device mentioned above are interoperable with standard LTE infrastructure as well as with the company's own TETRA and Tetrapol solutions.

Hytera plans to launch its dual mode TETRA/LTE and DMR/LTE devices later this year, including a version with an additional small screen on top of the radio. It says the *Android* devices will support Wi-Fi, Bluetooth, RFID, GPS, NFC and video, and will work on LTE frequencies. And Motorola Solutions' already available *LEX L10* combines the features of its rugged APX series radios with capabilities more often associated with smartphones.

Jerry Nachmann, the firm's regional field and solutions marketing manager, believes that while public safety users will always need a fail safe option to communicate by voice (whether using TETRA or other PMR technologies), their ability to share photos and videos is "highly beneficial" to helping solve and prevent crimes.

"Public safety LTE provides additional layers of information that can help in critical situations. If you think of a situation where a terrorist or a criminal is on the loose, command centres could, over an LTE network, push out a picture of the suspect to the LTE devices officers are carrying and help apprehend the suspect with greater ease."

But sharing photos and videos are just part of the picture, and Nachmann points out that public



DAMM's *TetraFlex* app enables PTT in TETRA groups. It can be run on smartphones that use the *Android*, *iOS* and *Windows* mobile operating systems.

safety LTE networks with smart devices provide a "great platform" for applications that improve a public safety agency's efficiency.

Denmark-based DAMM is likely to agree here. The vendor's *TetraFlex* client app offers TETRA over LTE for critical communication users, and provides coverage extension as well as data capacity for videos and pictures. It also supports full integration with the company's *TetraFlex* radio systems, and enables PTT in TETRA groups, individual calls, messaging, video streaming and GPR tracking. According to the firm, no radio gateways are required. It adds that the app supports *Android*, *iOS* and *Windows* operating systems, and offers a vendor-independent soft terminal for non-critical voice and data communications through Wi-Fi, UMTS and LTE networks. ■

LTE: WHAT'S NEEDED FOR CRITICAL COMMUNICATIONS

The TCCA (TETRA and Critical Communications Association) has identified four key focus points for governments to consider if they are looking to implement LTE-based public safety networks. In a recently published white paper, it says commercial mobile network operators already have the ability to deliver mobile broadband to public safety services. While many public safety organisations are already taking advantage of this, the association says it is only for non mission-critical applications, with the traffic carried by a 'best efforts' commercial service.

For safety critical applications – such as dispatching ambulances, sharing details of terrorist suspects, and dealing with major incidents – the TCCA says it is essential to use networks that are suited to mission-critical communication, taking four key areas into account:

Spectrum: For a public safety operator to build its own infrastructure anywhere in the country, it will be necessary to obtain suitable spectrum. Those responsible for public safety communications must review the opportunities for obtaining spectrum. They must engage with the appropriate government ministries and the national regulator to establish how this can be made available for public safety, and to enable choice in the provision of broadband data services.



Security: Secure communications are essential to enable confidential information to be passed safely over the network, and broadband data services will likely carry more confidential information than existing voice networks. Security mechanisms are being designed into future LTE standards, but the standard is not currently at a security level to match purpose-designed PMR standards. A review of the security arrangements available in LTE systems, and in any commercial network that is used, should be undertaken by suitably qualified staff.

Ownership: As with any business, commercial mobile networks are subject to being bought and sold.

Such transfers of ownership may be to companies anywhere in the world. Some governments are cautious about critical national infrastructure being owned by foreign firms. Those responsible for public safety communications should consider the national government policy with regard to foreign ownership and operation of telecoms infrastructure.

Funding: Assuming that spectrum has been secured, the degree to which dedicated infrastructure can be built will be dependent on funding. Nationwide infrastructure will be relatively costly in many countries and an optimal balance between dedicated and commercial networks will need to be found. The use of commercial networks can significantly reduce the capital investment for public administrations and also the time required to implement public safety services. However, their use will incur ongoing service charges. It is likely that the re-use of existing base station sites and sharing infrastructure can mitigate some of these costs.

The TCCA believes that there is no doubt mobile broadband services are likely to bring significant benefits for many public safety users, enabling faster and more targeted responses to incidents, as well as efficiency savings. But it adds that there is no simple answer to how mobile broadband should be provided to public safety users.



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DTC's SWE system (right) features Sierra Wireless' AirPrime M2M module. It may not solve Bangkok's notorious traffic jams but will help fleet managers make their drivers and vehicles more efficient.

How wireless solutions are helping the region's transportation sector overcome congestion on their communications networks.

In Thailand, most accidents in public transportation reportedly occur because of bad driver behaviour and poor fleet management and monitoring systems. For instance, drivers exceed speed limits, or companies make them work long hours which violates safety standards.

In early 2016, the Thai Government began an initiative as part of its efforts to eliminate accidents caused by public transportation. Under an enforcement from the Department of Land Transport, all new-registered public transportation, trailers and lorries with 10 wheels or more must have GPS installed by the end of 2017.

One company that has been certified to provide such systems is the Bangkok-based Drivers' Testing Centre (DTC) Enterprise Company. Established in 1996, DTC says it provides fleet tracking and management system services to more than 10,000 governmental and private organisations and companies throughout the country.

The firm designs and manufactures its own real-time solutions for transportation, and claims its fleet management system provides customers

with one of the most reliable and efficient solutions on the market.

Designed and developed at DTC's research laboratory, the *SWE Series Fleet Management and Monitoring* solution is built around the AirPrime embedded module from Canada-based wireless communications equipment specialist Sierra Wireless. It also uses the vendor's *Open AT Operating System* in order to develop customer requirements.

The *SWE Series* is a small electronic device connected to the GPS network. According to Sierra Wireless, GPS gives fleet vehicle owners greater control of their operations, lowers management costs, and increases security.

As well as being used to track the position of vehicles, DTC's system can also report their starting and stopping times, speed, as well as engine status. The tracking system integrates all necessary information, such as administrative boundaries, areas, points of interest, landmarks, etc., onto the digital map. DTC says it can generate more than 27 types of real-time

reports on speed, engine status, location and infringements into prohibited areas according to the customer's needs.

This information is then reported via a GPRS network to the customer's computer in real-time, thus allowing evaluation and detection of the vehicles' usage for efficiency enhancement. For public transport systems, all data is linked to the Department of Land Transport's management centre.

By deploying its tracking system, the company says users also benefit from reduced costs, such as fuel expenses and maintenance, and increased efficiency and effectiveness of fleet usage. It says the system also alerts managers to inappropriate utilisation, such as long stopping or engine idling times, and provides greater safety by tracking vehicles and monitoring engine status as well as driver behaviours.

With Sierra Wireless' help, DTC reckons it has come up with a solution that makes fleet management easier, reduces employee workload, helps to achieve customer satisfaction, and increases business opportunities.

Eavesdropping "impossible" at Sri Lanka airport

Sri Lanka's Bandaranaike International Airport (BIA) is based in Colombo, and up until 2013 it was the country's only international airport. It is operated by Airport and Aviation Services Sri Lanka (AASL), a government-owned company that manages and develops civil airports.

BIA previously relied on analogue radios but AASL decided these were not sufficiently secure and in 2011 it opted to commission a digital system using Airbus Defence and Space's *Claricor* system. Based on a single switch and base station site, the new network has been designed to provide 100 per cent coverage throughout the main BIA site, both indoors and outdoors, as well as across all AASL's peripheral facilities within a 25km radius of the airport.

Designed to meet the needs of airports and for use in the industry and transport sectors, Airbus says *Claricor* is aimed at small to medium-sized networks but offers many of the advanced functions of larger networks. These include secure voice and data services, individual calls, group calls and dispatcher functionalities.

In addition, it claims the platform can easily expand from covering a small group of users served by a single site to becoming a fully-fledged network addressing the needs of a few thousand subscribers.

BIA's new network became fully operational in March 2012 and users immediately began reporting that it was delivering all the promised benefits. Wipula Wimalshanthi, AASL's head of electronics and aeronautical engineering, said: "An analogue system is vulnerable to intrusion. The new TETRA system is much more secure, with its air interface encryption and authentication. It makes it impossible to eavesdrop."



Airbus supplied its *Claricor* TETRA system (right) at Sri Lanka's Bandaranaike International Airport (above). According to its users, the new network's voice quality and omnipresent coverage is "vastly superior" to the previous analogue system.

Wimalshanthi also said that the quality of voice and coverage offered by TETRA was "vastly superior" to the previous analogue system, and that the additional functionalities are a huge advantage. As well as the features listed above, *Claricor* also includes automatic vehicle location (AVL), short data messages (SDS), status messages and a network management system. Ground staff and security personnel are the main user groups, and Airbus says the ability to organise different communication groups for different tasks has enabled greater co-operation within the organisation.

Furthermore, the new platform is IP-based which, according to Wimalshanthi, is a most important characteristic. He believes the system's versatility and ability to add new functionality in the future will be crucial to its long-term success.

The network currently includes 135 handheld TETRA radios and 71 mobile *TMR880i* radios from Airbus. To get the airport staff up to speed with their new communication capabilities, the company initially brought seven users to its training centre in Europe. This was followed by two onsite training programmes back in Sri Lanka, which were delivered during the commissioning process.

In 2009, AASL began construction on Sri Lanka's second international airport. Mattala Rajapaksa International is located in Hambantota city, 241km south-east of Colombo. It reportedly has the capacity to handle one million passengers per year but is expected to handle five million passengers, 50,000T of cargo and 6,250 air traffic operations per annum by 2028.



Hytera said its installation at Tanjung Priok seaport was Indonesia's first operational DMR trunking network. The deployment was based around the company's DS6210 base station.



Given the success of the BIA digital communications project, AASL once again commissioned an Airbus TETRA network for Mattala Rajapaksa International Airport, which was officially opened in March 2013.

Intelligent port at 'thousand-island' nation

Known as the 'thousand island' country, Indonesia is the world's largest island nation. The main seaport of Tanjung Priok in Jakarta serves many ferry connections to different parts of the archipelago. It is managed by Pelindo II, one of several state-owned corporations that are responsible for the governance, regulation, maintenance and operation of ports and harbours in Indonesia.

Tanjung Priok is the country's largest seaport, and has 20 terminals for passengers, containers, etc. With an annual traffic capacity of around 45 million tons of cargo and 4,000,000 TEUs (twenty-foot equivalent units), it provides services to more than 18,000 ships every year.

These complex and varied operations need to be supported by communications equipment that offers the highest levels of stability and signal channels to deal with heavy traffic flows. Radio communications at the port have to guarantee that each workline is able to call and receive messages independently among any talking group, and that the talking group can be easily divided and then re-grouped flexibly if needed.

Tanjung Priok's existing communication infrastructure was sporadic and had been



Left: TCIT's huge seaport in Vietnam covers a total area of 40 hectares featuring three berths, 29 cranes, 56 tractors and four reach stackers. Its *MOTOTRBO Capacity Plus* comms system from Motorola Solutions is based around four *R8200* repeater units (above).

deployed in point-to-point mode which meant poor coverage as it was unable to support long distance communication.

Furthermore, the management of radio comms at a port usually includes a division of work, providing voice recording and replay for monitoring and analyses. This enables intensive dispatching as well as management of the entire radio network on site. In 2013, Pelindo II urgently needed a modern radio communication management system to increase operating efficiency at Tanjung Priok.

Working with Mobilkom, a licensed trunking radio operator and local provider of radio communications service solutions, the company deployed a Digital Mobile Radio (DMR) system based on Hytera's equipment. As part of the vendor's *Trunking Pro* solution, Mobilkom delivered: 60 *PD78X* DMR portable radios; 40 *MD78X* mobile radios; one *DS6210* base station with Mobile Switching Office (MSO); and a network management system.

During the first phase, this single site network was used to cover the port of Jakarta only. With IP-based network design connecting the base station and MSO, Hytera says Pelindo will be able to further expand and upgrade its other ports more easily.

The installation at Tanjung Priok is said to have resulted in Indonesia's first operational DMR trunking network. Hytera says the benefits include digital operation, full coverage and smart management. According to the vendor, its DMR trunking terminals adopt advanced digital voice and channel coding technology, which can better suppress noise and interference, especially at the edge of coverage. It claims this achieves better audio quality compared to analogue technology.

Moreover, Hytera says its DMR trunking pro technology adopts TDMA two time-slot technology which "greatly" enhances spectrum efficiency and system capacity.

It adds that the platform is designed as an exclusive IP network which establishes a full coverage between terminals and control centre. A "full and smooth" communication signal from a single site not only covers onsite working place, but also connects every vessel, cargo, container, quay and port's control room, thereby providing full network coverage for the entire site at a lower operating cost.

To meet the port authority's need for a comms system that could be managed more efficiently, Hytera says its DMR trunking platform adopts

client/server architecture. It says this can support up to 32 dispatchers to meet the demands for management by different lease groups and numerous dispatchers. According to the firm, this results in a communications network that can manage the port's multiple and varied operations more flexibly and efficiently.

"Hytera's DMR Trunking Solution fulfils Pelindo II's daily heavy operations of communication requirement with a secure, reliable and efficient dispatching system," says Heru Satrio, head of the Indonesia Port Corporation II's information system bureau. "We are very satisfied with the performance and are looking forward to expanding the solution to another port."

Maximising radio capacity for seaport in Vietnam

Saigon New Port Cooperation is the biggest terminal operator in Vietnam. In 2011, it established the Tan Cang – Cai Mep International Terminal (TCIT) Company Ltd., a joint-venture with three shipping firms including Mitsui O. S. K. Lines of Japan, Hanjin Shipping of Korea, and Wanhai Shipping of Taiwan.

With the advantage of its location in the city of Vung Tau on a peninsula in southern Vietnam, the port is said to be well-suited for trans-shipment movements to and from Ho Chi Minh City and the provinces of Dong Nai, Binh Duong and Long An.

Covering a total area of 40 hectares, TCIT's facility can handle big-sized vessels with deadweight up to 160,000 tonnes, or around 15,000 TEUs. Terminal facilities include: three berths of 890 metres in length; a 34 hectare container yard; nine ship-to-shore (STS) gantry cranes, 20 electrified rubber-tyred gantry (ERTG) cranes, 56 tractors and four reach stackers. The seaport also boasts cutting edge IT facilities such as its Terminal Operating System (TOS).

TCIT aims to provide international standards of terminal operations in Vietnam. To coordinate the large number of workers and trucking traffic across the site, the port's management know that a reliable and robust radio infrastructure is crucial for communications. To overcome the challenges of busy channels, varied call needs and a noisy environment, they needed a new radio system that provided greater capacity, coverage and clarity. As a result, they chose Motorola Solutions' *MOTOTRBO Capacity Plus* to provide the backbone of the port's radio communications network.

Motorola says its digital two-way radio communication system offers integrated data communications, enhanced voice communications and 40 per cent longer battery life compared to analogue radios. It also claims *MOTOTRBO Capacity Plus* delivers twice the calling capacity of analogue systems through the use of TDMA technology.

Capacity Plus enables users to further expand *MOTOTRBO*'s capacity. The feature is said to provide a scalable, single-site trunking solution that enables more than a thousand radio users to share both voice and data communication on the same system. According to the vendor, *Capacity Plus* enables users to link up to 12 voice paths and 24 additional dedicated data paths that can accommodate as many as 1,200 users.

It adds that some of the other digital benefits of the system include lower infrastructure cost as *MOTOTRBO* does not require a second repeater for the second call; support for data applications such as text messaging; and GPS-enabled applications.

TCIT decided that the platform could offer efficient and cost-effective way to expand its radio communications. With the help of local Motorola distributor Vienthong Radio Company, it successfully installed a *MOTOTRBO Capacity Plus* system. Motorola says that eight pairs of frequencies are usually required to have eight channels, but TCIT's system provided eight channels on four pairs of frequencies. The seaport has 21 talk groups in its fleet, and could easily communicate and coordinate with everyone on all the eight channels. Using the 'all call' feature, the operator could also reach out to the entire fleet in an instant.

The entire deployment took two weeks. It comprised four *MOTOTRBO R8200* repeater units, 27 *P8268* portables, 57 *M8260* mobiles, as well as radio accessories including Motorola's duplexer and antenna.

Following two days of user training, the terminal operators were calling on their portables as they moved about in the berth, while truck drivers stayed connected with the mobiles installed in their vehicles.

Ngo Thanh Tung, TCIT's team leader of IT, says *MOTOTRBO Capacity Plus* delivered the promise of maximising radio capacity and performance, and that users have greatly benefited from the system's trunking feature. "We enjoy the flexibility of all call, group call and private call capability. Clearer voice, longer battery talk time and clear channels delivered by an expanded capacity have definitely added to the plus points." ■

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Emerging technologies to feature at New Startup Alley, Cyber Security Zone and bigger AR/VR segment



As Asia continues down the path of digital transformation and its cities get increasingly connected, CommunicAsia and EnterpriseIT 2017 will add brand new feature zones to address the growing need for data security and the budding startup culture in the region. In addition, the event will also see a bigger augmented reality (AR) and virtual reality (VR) segment as the show grows to occupy the whole of Marina Bay Sands for the first time.

With the Cybersecurity Market Report predicting worldwide spending on cyber security to top US\$1 trillion for the five-year period from 2017 to 2021, Asia seeing a record US\$23.4 billion in startup funding in the second quarter of 2016, and worldwide revenues for the AR and VR market expected to reach US\$162 billion in 2020, the new zones are timely additions to the event that will be held from 23 - 25 May 2017, at the Marina Bay Sands, Singapore.

Key trending technologies and network infrastructure that are the pillars of smart

cities, businesses and lifestyles, such as borderless broadband, Internet of Things, cloud and data-centric solutions, satellite communications and enterprise mobility, will continue to be featured prominently at CommunicAsia and EnterpriseIT 2017.

"As cities and their populations become smarter and more connected, the amount of data they produce also increases. As reported by Cisco Systems' latest Visual Networking Index, the Asia Pacific region will drive 45 per cent of the world's mobile data traffic by 2020, and global IP traffic will increase nearly threefold over the next five years with the number of devices connected to IP networks exceeding three times the global population during this same period," said Victor Wong, Project Director for Communications Events at organiser UBM SES. "CommunicAsia and EnterpriseIT will provide first-hand access to the latest in constantly evolving technology and new disruptive innovations needed to ensure the sustainable growth of smart city ecosystems and the security of data that flows through them."

Innovations at CommunicAsia and EnterpriseIT 2017

Exhibiting at NXT@CommunicAsia – the event's showcase of transformative technology, is CryptoGuard, a Swedish developer of content protection. The company, which has experienced substantial growth in recent years, will be demonstrating its DRM platform and new OTT solution CryptoLITE™ as well as its proven advanced CAS platform.

"We are expanding our markets with a strong focus in Asia, and having recently established a sales and support office in New Delhi, India, exhibiting at CommunicAsia seemed inevitable in our progress," said Hannu Vunnel, Marketing Director at CryptoGuard. "We are looking forward to further strengthening our position in the Asian market, and at CommunicAsia2017, CryptoGuard hopes to be recognised by major players as a leading innovator for content security."





In today's volatile business climate, there is a pressing need for digital transformation across vertical industries. The event puts a big focus on technology to enable smarter businesses, and allow visitors to learn about and source solutions that are aimed at improving efficiencies and revenue.

Also returning to CommunicAsia for the third time is Aarenet AG, which provides encrypted WebRTC audio and video conferencing in HD quality for telecom service providers. The company will be introducing its enhanced Cloud PBX solutions including a Cloud Contact Centre, and a host of other enhancements to existing products and services.

"Aarenet AG first exhibited at CommunicAsia2015, where we received great success in business development

activities for our company," said Bao Vo, Regional Director at Aarenet AG. "We strongly believe that CommunicAsia is the premier infocomm tradeshow in the Asia Pacific region due to its excellent infrastructure in Singapore, its modern facilities, and the fact that the event attracts patrons from almost all carriers and telecom service providers regionally. We are looking forward to exhibit at CommunicAsia2017 and the new prospects it will bring."

SatComm, which boasts Asia's largest gathering of more than 160 satellite communications companies, is another integral part of the event. Taking place on Level 1 of the Marina Bay Sands, SatComm will showcase satellite solutions that will enable upcoming technologies such as 4K and IoT to support smart city developments.

CommunicAsia2017 Summit

With the heightened pressure and push for seamless integration of technology, analytics and connectivity, the CommunicAsia2017 Summit is set to augment and ultimately revolutionise today's entire ecosystem. Taking place throughout the event, the Summit will cover topics such as the Internet of Things, Security of Things, Smart Cities, Digital Talent Analytics, and Broadband.

This year's Visionary Address titled – Artificial Intelligence vs. Genuine Stupidity – Navigating Exponential Technologies to Create a Very Human Future, will be presented by Mr Rohit Talwar, CEO of Fast Future Research.



SHOWS AT A GLANCE:

CommunicAsia2017 | EnterpriseIT2017 Exhibition

Incorporating:	SatComm2017
Date:	23 – 25 May 2017 Tuesday to Thursday
Venue:	Basement 2, Level 1, 4 & 5 Marina Bay Sands, Singapore
Opening Hours:	10:30 am – 6:00 pm
Website:	www.communicasia.com www.enterpriseit-asia.com

BroadcastAsia2017 Exhibition

Incorporating:	ProfessionalAudioTechnology2017
Date:	23 – 25 May 2017 Tuesday to Thursday
Venue:	Level 4 & 6, Suntec Singapore
Opening Hours:	10:30 am – 6:00 pm
Website:	www.broadcast-asia.com

CONFERENCES AT A GLANCE:

CommunicAsia2017 Summit

Date:	23 – 25 May 2017 Tuesday to Thursday
Venue:	Level 4 & 5 Marina Bay Sands, Singapore
Website:	www.communicasia.com/conference/conference-highlights/

BroadcastAsia2017 International Conference

Date:	23 – 25 May 2017 Tuesday to Thursday
Venue:	Level 3, Suntec Singapore
Website:	www.broadcast-asia.com/conference/conference-highlights/



An ocean apart

NITIN MADHAVAN looks at the trends in mobile financial services and telecoms on both sides of the Indian Ocean and discovers similarities as well as marked differences.

The wireless communications markets in India and Africa have really advanced over the past couple of years, and we have seen operators launching new services as well as strengthening existing ones.

Whilst some areas in both regions still have low mobile penetration rates, their markets have evolved beyond the initial 'land grab' phase of service providers competing for licenses and rolling out the early networks. The more established operators are now looking at revenue improvements through increasing their services and making their offerings more competitive.

One of the most important services in this region is mobile money and money transfer, with the likes of *M-PESA* which was introduced in Africa in 2007, and Immediate Payment Services launched by the National Payments Corporation of India in 2010 (the NCPI is an umbrella organisation for all retail payment systems in India).

The mobile money markets on both sides of the Indian Ocean have now grown beyond initial micropayments and simple money transfers and, certainly in India, we are transitioning towards a largely cashless society.

India's MFS drivers

India has recently completed a massive demonetisation drive following the abolition of its largest currency notes in a fight against unaccounted wealth and corruption. This initiative has been a boon for local e-payment providers. For example, mobile payments and commerce platform provider Paytm reported a three-times surge in new users, adding more than 14 million new accounts in November alone. Meanwhile, Oxigen Wallet claims its daily average users increased by 167 per cent since demonetisation began.

The initiative has also presented an opportunity for telcos to open banks, offering competitive interest rates and allowing people to deposit cash and use their mobiles to make payments for everything from cabs to airline flights. This new opportunity gateway has encouraged new players into the market, but has also raised concerns in the fintech community about cybersecurity and account hacking.

Another key driver in mobile financial services (MFS) is serving the unbanked and underbanked. According to the World Bank, around two billion

adults worldwide don't use formal financial services and more than 50 per cent of adults in the poorest households are unbanked.

The Indian market has around 75 per cent mobile penetration and 53.1 per cent financial inclusion, presenting a clear opportunity for MFS. As part of its *Global Telecoms Risk Management Survey 2016*, Neural polled 113 individuals at different levels in operators from every part of the world. The results, published in February 2016, revealed that compared to other regions, Central Asia (which includes India, Pakistan and Bangladesh) saw greater opportunities in the fields of allowing the unbanked to establish a credit history (25 per cent), and helping the World Bank's 'unbanked' initiative (17 per cent) (*see graph opposite*).

EY (Ernst & Young) Global Telecommunications leader Prashant Singhal also points out that there are three benefits for financial institutions promoting MFS: expansion of reach; decrease in capital expenditure due to lesser need for physical infrastructure; and lowering of transaction cost.

"The cost of mobile banking channels is significantly lesser compared to traditional channels," says Singhal. "For instance, a mobile

banking transaction can be done at 10 to 15 per cent of the branch banking cost. The cost involved in financial infrastructure is also much less – USD400 for agent-enabled mobile banking as compared to USD250,000 for a traditional branch. Furthermore, for banks the cost to serve customers declines by a staggering 96 per cent when moving from a branch infrastructure to a mobile platform.”

In emerging economies, all this adds up to a very attractive prospect.

The value of m-banking in Africa

The African focus now is on expanding the mobile money system and adding digitisation to improve efficiency – making previously manual processes more automated and relying more on systems, networks, processes and technology.

In many respects, mobile money is ‘old news’ to the African market – Safaricom has been championing mobile money and payments with *M-PESA* in Kenya for 10 years now. Whilst other countries like Uganda, Zambia and Zimbabwe are beginning to expand, Kenya and Safaricom remain leaders of the pack.

However, although 350 million of the world’s unbanked adults live in sub-Saharan Africa, mobile financial services have not had the same level of success as Kenya elsewhere on the continent. Vodacom and MTN shut down their mobile money services in South Africa last year, and other countries have struggled. In South Africa’s case, this is most likely because the country’s banking system is already very sophisticated and around 80 per cent of the population have some type of formal bank account.

These figures are lower in Kenya. While formal inclusion for men in Kenya has risen steadily since 2006, formal inclusion for women leapt between 2009 and 2013 driven by the spread of MFS. This has lessened women’s exclusive reliance on the use of informal services. Compared to men, however, women still have lower access to formal prudentially regulated services such as banks (35 per cent for women compared to 50 per cent for men).

Formal inclusion and exclusion also differ across regions within Kenya. Formal inclusion is more than 70 per cent in most parts of the country, but slightly lower in the western and coastal areas. The northern parts of the country continue to face higher levels of exclusion, up to about 52 per cent.

Going back to South Africa, getting a new license for MFS in the country is now difficult thanks to its formal regulatory framework. Mobile money proponents I have spoken to say the regime is now harder to navigate for new entrants. Compare that to India where a special dispensation for non-banks financial companies or e-money providers is available.

For example, Bharti Airtel has started its own bank, known as a ‘payment bank’. These payment banks generally get a quicker license owing to the capital investments and various other factors when compared to the process of gaining a full-fledged license to start a bank.

However, while this may make it more attractive for telecoms companies to become banks, with great power comes great responsibility. Furthermore, regulators in both India and Africa are getting tougher on the telcos. The public sector has become more involved, and operators on both sides of the ocean are beginning to find themselves facing huge fines for any money laundering or illicit activity conducted on their networks. Should they fall foul of fraudsters repeatedly, they run the risk of having their licenses revoked.

But for me, the positives of this transition towards less cash and a more ‘mobile’ payment society outweigh the risks. By taking money from paper to wireless, many of the previously unbanked populations in the rural communities of India and Africa will now be able to move and store funds more easily and safely than ever before.

The majority of the population whose transactions are monitored and protected are good, honest folk and this increased visibility in transactions, both domestic and across borders, will help the countries in which they operate to trade more freely with the West. In order to trade with the USA and EU, countries must be able to show that they are on top of any potential crime (money laundering)



Nitin Madhavan,
Regional business
development
manager,
Neural Technologies

and terrorism threats within their borders. The data available to telcos makes them one of the best positioned to spot terrorism and crime and help law enforcement to stop these threats, enabling greater trust and better trading potential.

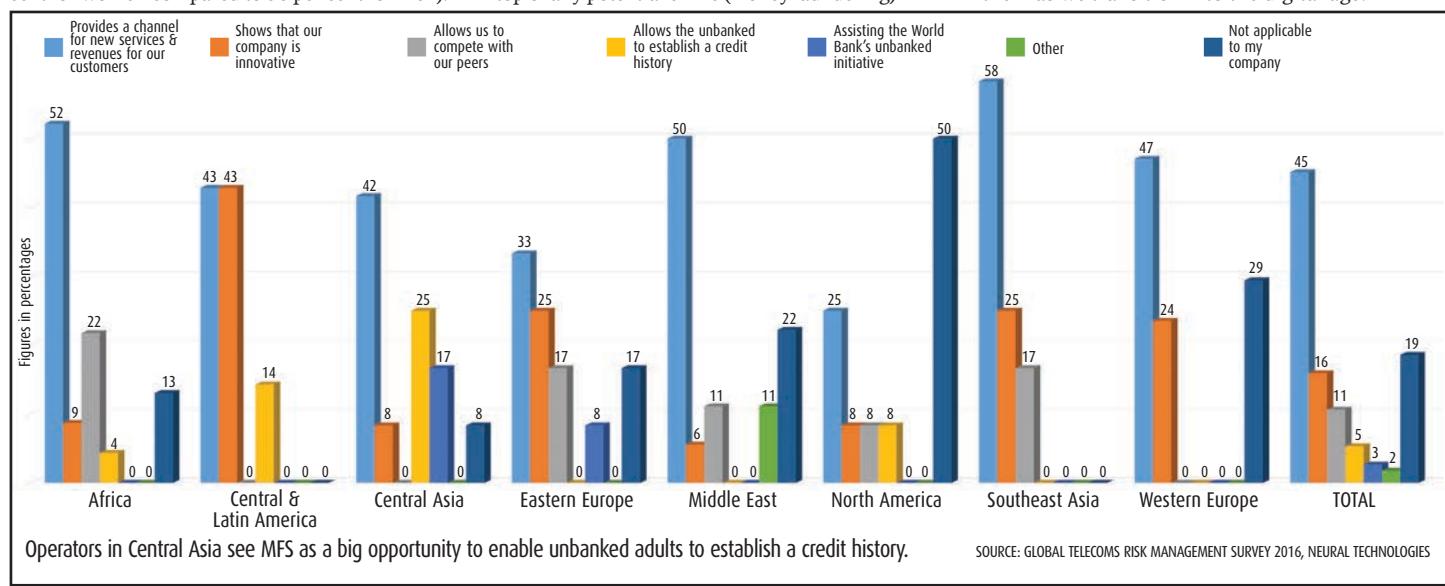
How IoT will affect the market

The growth of the Internet of Things (IoT) has the ability to take mobile money a stage further and integrate more areas of daily life for people within these two markets. Mobile money in emerging regions will be the catalyst for creating smart cities, transferring vast amounts of data over networks without requiring human-to-human or human-to-computer interaction.

Once these smart cities emerge, their inhabitants will start to see the full potential of the IoT, as interoperability will not be limited to banks and telecoms, but spread to utilities, municipal authorities and transportation systems.

Any company will be able to integrate into this payment and mobile money ecosystem and force the competition to innovate. Once an ecosystem is built, machines or devices will be able to determine the best rate and company for every aspect of daily life automatically, from electricity to groceries to healthcare.

As the IoT spreads its wings worldwide, the technological leaps made by India and Africa will set them in good stead to take advantage of the digital future. It will be interesting to see how these two regions measure up against the UK and USA in five years’ time. My money would be on these currently ‘emerging’ markets overtaking the currently ‘developed’ world and setting the bar for them as we transition into the digital age. ■



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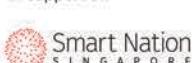
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Aircraft broadband system integrates satellite and terrestrial LTE networks



The European Aviation Network (EAN) has achieved a major milestone following a programme of test flights. Planned for introduction in mid-2017, the EAN is said to be the world's first integrated satellite and air-to-ground network dedicated to providing a true in-flight broadband experience.

The network is said to be unique in terms of the capacity and quality of broadband internet service it brings to the dense European aviation routes. The equipment it uses is very small and lightweight which, it's claimed, typical broadband satellite based solutions cannot offer.

The ground network will use 4G mobile infrastructure combined with satellite frequencies provided by Inmarsat. These are in the S-band spectrum (2-4GHz) that is typically used for weather radar, surface ship radar, and some communication

satellites (particularly those used by NASA for communication with the International Space Station).

The tests were carried out late last year by Inmarsat and Deutsche Telekom together with their technology partners, Nokia and Thales.

The first live connection in the field was accomplished in a broadband video conference with both parties connected via the dedicated EAN LTE mobile network. The flight trial tested the performance of the onboard equipment provided by Thales and the ground network from Deutsche Telekom and Nokia.

The partners say the systems performed multiple successful handovers between sectors and cell towers, and maintained a stable connection.

The LTE ground network for the EAN differs from conventional LTE networks as it needs to work at speeds of up to 1,200kph, and at cruising



Working with Deutsche Telekom, Nokia has adapted its LTE BST and RRH to Inmarsat's S-band frequency and built a specific antenna to cover the sky.

altitudes requiring cells to function across distances of up to 150km. To achieve the live connection to the LTE ground network, Deutsche Telekom and Nokia have adapted Nokia's LTE base stations and remote radio heads to Inmarsat's S-band frequency, and built a specific BST antenna to cover the sky.

Nokia will manage the operations for the network from its global delivery centre in Romania. In addition to the live network, Nokia and Deutsche

Telekom will setup a full end-to-end ground network reference system in Stuttgart, Germany. This will include all components and integrated on-board equipment from Thales to prepare for technical challenges, such as compensation of the Doppler effect due to high aircraft speeds, for example.

Since the EAN's initial announcement in September 2015, Deutsche Telekom and Nokia say they have made steady progress and are on track to deliver the ground component of the project. This includes the rollout of the approximately 300 antenna sites needed across Europe and connecting the network live over-the-air.

In parallel, Inmarsat and Thales are moving forward with implementing satcoms for the EAN, having completed construction and associated sub-system tests of the satellite earlier last year.

Enet offers nationwide open access broadband network



Irish operator Enet has gone live with a backhaul network that connects and further integrates its metropolitan area networks (MANs) into a national telecoms platform.

This latest project for the company brings its total investment to more than EUR100m since it was acquired by specialist technology, media and telecoms investment firm, Granahan McCourt Capital, in late 2013.

Enet's national backhaul network is now fully operational. It includes more than 3,700km of high-capacity fibre and connects 55 towns.

The operator says the deployment marks a major breakthrough as it means a "top class" open access broadband network is now available throughout Ireland.

The company adds that it will also enable it to offer MAN customers access to higher speeds as well as greater network reliability.

Enet says it runs the country's second-largest fibre network. It includes 94 MANs operated on behalf of the government, what's described as a "unique" dark fibre backhaul infrastructure transiting the rail and gas network, and three proprietary metro networks including an 100km fibre ring in Dublin.

CEO Conal Henry says: "The investment in a national backhaul network gives us access to dark fibre for the vast majority of our traffic

sources and offers us a far greater flexibility of how we design and deliver our services to the benefit of our 70 operator customers and their end users."

The company also claims to operate one of the largest licensed wireless networks in Ireland. When combined, Enet says its fibre and wireless infrastructure creates a fully integrated, nationwide network, making it the country's largest open-access network operator.



The travelling clinics use a special mobile app and fleet of 4x4 vehicles to provide on-site HIV testing in remote areas of Lesotho.

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Mobile programme helping to fight HIV



The Vodafone Foundation has announced a pioneering mobile-based HIV programme in Lesotho, where an estimated 23 per cent of the population is HIV positive.

The programme was developed in conjunction with the Lesotho Ministry of Health and has initially been rolled out in the Maseru and Leribe districts.

It combines Vodafone's *M-PESA* mobile money service with travelling clinics and a smartphone app designed for healthcare professionals which

enables the tracking of patients in remote areas. The clinics use a fleet of 4x4 vehicles and provide on-site HIV testing in remote areas as part of a wider effort to provide basic primary healthcare. When people are identified as HIV positive, they are immediately registered with the *M-PESA* service and receive the funds needed to pay for transportation to a treatment centre.

At the same time, their details are recorded, via mobile, on a central database so that their future treatment

and care can be planned and recorded. These details can then be recalled in real-time by healthcare professionals in the field using a smartphone app developed by the Vodafone Foundation and Vodacom Lesotho.

Following the first rollouts, the Lesotho government has now committed to launching the programme across all other districts and integrating it within the country's primary healthcare strategy. It will be fully funded by the government from mid-2017.

Microsoft to use Nominet's TV white space technology

 Microsoft and Nominet have teamed-up to help ISPs across Africa leverage unused broadcast frequencies and deliver low-cost broadband access using TV white space (TVWS) spectrum.

As the available set of TVWS frequencies varies, Nominet has developed a geo-location database that tells devices which frequencies they can use in a particular area, at what power, and for how long. The database allows wireless devices to access TVWS frequencies, and was the first to receive regulatory approval for use in the UK.

As part of its *Affordable Access*

Initiative, Microsoft is working with public and private sector partners around the world to develop technologies and business models that will make it easier for billions more people to affordably get online. The company is currently supporting broadband connectivity programmes in Kenya, Botswana, Malawi, Ghana, amongst others.

To support its goals, Microsoft will use Nominet's TVWS database across its *Azure* cloud platform to enable the deployment of low-cost terrestrial wireless broadband internet to communities across the continent.

It will also leverage Nominet's

dynamic spectrum management technology. This has been designed to support two-way communications at relatively high data rates over long distances, and delivers connectivity to large open areas where it would be difficult to deploy fixed infrastructure.

"Spectrum is a scarce and valuable resource, and demand can outstrip supply," said Adam Leach, R&D director at Nominet. "Dynamic spectrum sharing allows the available spectrum to be used more efficiently than any existing static techniques. Maximising the efficiency of the spectrum usage lowers the barriers



In Africa, Microsoft is currently supporting TVWS projects in Botswana, Ghana, Kenya, Malawi, amongst others.

to access, enabling more users and devices to get connected."

UK-based Nominet is a global internet company. Since 1996, it has managed and run domain names that end in .uk, and is now said to be one of the world's largest country code registries.

Europe's first mission critical LTE network deployed

 Sepura Group subsidiary Teltronic says it has implemented Europe's first mission critical LTE network.

Already fully operational, the deployment provides complementary broadband services to RESCAN, the private TETRA network of the Canary Islands' public safety agencies whose end users include ambulance, police and environmental services.

Building on an existing Teltronic *NEBULA* platform, the new solution utilises the vendor's *eNEBULA MVC-6000*, a vehicular system capable of integrating different wireless technologies such as TETRA and professional LTE. Teltronic has also supplied rugged commercial LTE handhelds to provide services such as

real-time field-to-control video transmission, internet/intranet access, and customised applications that tackle the agencies' operational challenges.

In accordance with spectrum regulations for public safety users and broadband services laid out in Spain's National Table of Frequency Allocations, the system was implemented in frequency bands below 1GHz, bringing additional benefits in terms of radio propagation and indoor coverage.

"A hybrid TETRA-LTE network expands the range of services available to PMR users, protecting their investment while maintaining the same levels of security, reliability and resilience," says Juan Ferro, Sepura's VP of systems.

BodyCap creates 'Internet of the gastrointestinal tract'

 Ingestible connected pills that enable wireless medical monitoring have been approved for use in Europe's hospitals.

The *e-Celsius Performance* was developed by France-based BodyCap which specialises in miniaturised wireless monitoring devices for e-health applications.

The disposable electronic capsule is coated in a biocompatible medical grade plastic, and follows the intestinal transit after being swallowed by the patient. The pill then uses 433MHz frequencies to wirelessly transmit measurements of the patient's core body temperature every 30 seconds.

The readings are sent to a monitor called an *e-Viewer* which can be up to one metre away. The data

show alerts when the measurement is outside the range set by the healthcare professional.

Each *e-Celsius* pill is provided in standby mode. When the device is ready to be used, an activation box wakes it up and links it to the *e-Viewer* for data collection in real-time mode, or by recovery from the pill's internal memory with no loss of data, says BodyCap.

It adds that each device can store up to 2,000 data events and can remain operational for up to 20 days, but leaves the patient's body naturally after one to three days.

The *e-Celsius* will be sold directly or through specialised distributors for a unit price of EUR40 to 60 (USD42 to 63), depending on volume.



Asian telcos to expand in Africa via Djibouti

 Two Asian operators will use the Djibouti Data Center (DDC) as a strategic hub for their pan-African expansion.

The DDC serves as a major meeting point for submarine cable systems

The Djibouti Data Center is East Africa's first and only Tier 3 carrier-neutral facility with direct access to all major international and regional fibre systems connecting Africa with Europe, the Middle East and Asia.

including the new SEA-ME-WE 5 (Southeast Asia-Middle East – Western Europe) cable which was launched at the end of 2016. Stretching around 20,000km, SEA-ME-WE 5 connects Djibouti with China via 18 landing points including one in Egypt.

Last December, China Telecom Global (CTG) said that the centre will help facilitate its network expansion in East Africa. CTG is a founding member of the SEA-ME-WE 5 consortium.

In addition to SEA-ME-WE 5,

the DDC provides access to cable systems such as EIG, EASSy, Aden-Djibouti, and Ethiopia-Djibouti. In November 2015, it also announced an agreement with PCCW Global to support the AAE-1 (Asia-Africa-Europe 1) submarine cable network.

Hong Kong-based PCCW Global is a founder consortium member of AAE-1 which spans around 25,000km, uses 100G technology, and has a capacity of more than 40 terabits. The system is due to be ready for service in early 2017.

Europe sees first 4.5G

 TIM is the first European operator to offer its customers download speeds of up to 500Mbps on its mobile 4.5G network. The service is currently available in Rome, Palermo and Sanremo via the new Sony Xperia XZ smartphone. It is currently being rolled out to Naples and Milan, with other major cities to follow later this year. TIM's 4.5G technology uses new LTE 'L band' frequencies at 1500MHz, along with new coding and modulation techniques and antenna systems evolution to increase spectral efficiency.

New testing initiative

 Cisco, Ericsson, Huawei and Nokia have signed an MoU to create the NFV Interoperability Testing Initiative. NFV-ITI will focus on NFV solutions actually used in service provider networks. It will recommend generic principles, including interoperability test cases, criteria, processes, methods, guidelines, templates and tools. It will also apply best practices from all existing interoperability testing activities in the industry, such as the NVIOT forum efforts. The general guiding principles for NFV-ITI are openness, fairness, reasonableness and non-discriminatory treatment.

Sparkle PoP for Ooredoo

 Sparkle's Sicily Hub in Palermo, Italy has become Ooredoo Tunisia's main PoP in Europe. The operator says its customers will now benefit from an "enhanced" data experience, improved coverage and increased diversity options as a result of the reduced latency and shorter traffic routes for ISPs exchanging content locally through the PoP. In addition, the hub provides direct access to the 19 submarine cables that land in Sicily, connecting Europe to Africa, the Middle East, Asia and North America.

Iconic building adds Xirrus Wi-Fi network

 The Van Nelle Fabriek complex in Rotterdam has installed a Xirrus Wi-Fi network throughout its office spaces and public areas.

Considered the main industrial monument in the Netherlands, the Van Nelle Fabriek was built between 1927 and 1930 for the production of tobacco, coffee and tea. After the factory stopped manufacturing in 1998, the building was transformed into offices and is now home to more than 80 entrepreneurs and businesses including a variety of new media and design companies. In 2014, it was recognised as a UNESCO World Heritage Site.

Xirrus Wi-Fi will be used across the site as part of a broad infrastructure upgrade. All critical building and facilities management systems across the Van Nelle Fabriek – which spans

more than 68,000m² and is set in around 11 hectares of outdoor space – will be operated and managed via the Wi-Fi.

Businesses will also gain access to a high density 5GHz network that meets current demands for video streaming, cloud-based computing and document sharing – even when the complex plays host to major conferences or other big events.

"Because many creative industries have businesses here, they need to be able to stream high-resolution video, HD photography, and backup their large media files to the cloud for safe keeping or file sharing," says Roger Meertens, GM, Van Nelle Fabriek. "The high-density Wi-Fi offered by Xirrus ensures that companies can always rely on their connection, even at times of extreme usage."



Recognised as a UNESCO World Heritage Site in 2014, the Van Nelle Fabriek in Rotterdam is said to be an iconic example of Europe's Modern Movement.

Meertens adds that thanks to software programmable radios that can easily cope with new Wi-Fi standards, the system also has the capability to adapt to future needs, and means that there will be no need for Van Nelle Fabriek to resort to costly replacement programmes.

Vodafone Hutchison virtualises networks

 Vodafone Hutchison Australia (VHA) is virtualising its networks with the help of Cisco and Ericsson.

Through simplification of its network and infrastructure, it's claimed VHA will benefit from having the tools to become more agile, innovative and more proactive in the way services are brought to market. It's hoped that this will ultimately result in an improved customer engagement experience alongside reductions in opex and capex.

The deal represents the first major collaboration between Ericsson and Cisco on telecom cloud infrastructure since they announced the formation of a global business and technology partnership in November 2015.

The joint architecture solution comprises Ericsson's *Hyperscale Datacenter System* and cloud and SDN software components, together with Cisco's *WAN Automation Engine*, *Network Services Orchestrator* and routers. Cisco is also providing both virtualised and physical security

technologies, along with services and support. Ericsson will be responsible for the integration of its products with Cisco's.

VHA CTO Kevin Millroy says: "The new infrastructure opens the door to new business models and markets, such as Internet of Things, for Vodafone."

Ericsson has already worked with Vodafone Hutchison Australia. In 2014, it replaced and upgraded the cellco's core network, including virtual EPC and virtual IMS/VoLTE.

UK police equipped with body cameras



It's claimed the cameras have already shown they can help bring about speedier justice for victims.

 What's believed to be the largest rollout of body-worn cameras by police anywhere in the world has begun in the UK. In a GBP10m project, more than 22,000 frontline officers from the Metropolitan Police Service (MPS) in London will be equipped with body worn video (BWW).

The devices will be attached to the officer's uniform but will not be permanently recording. According to the MPS, this ensures that officers' interactions with the public are not "unnecessarily impeded".

Once the cameras are docked back at the station, all footage is automatically uploaded to secure servers hosting

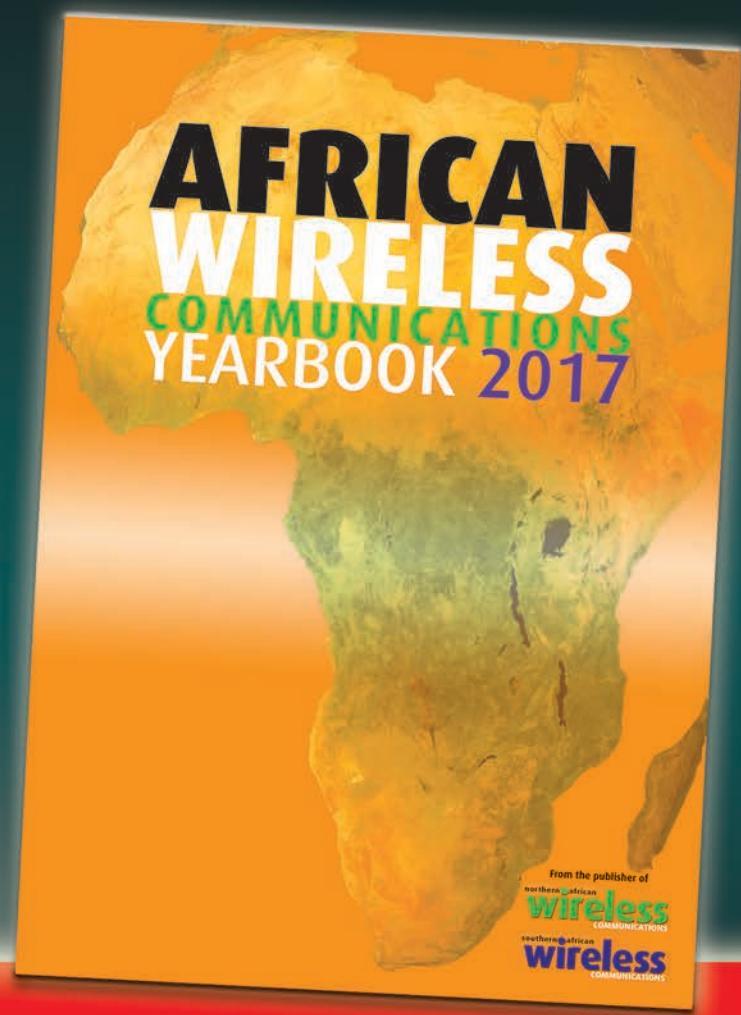
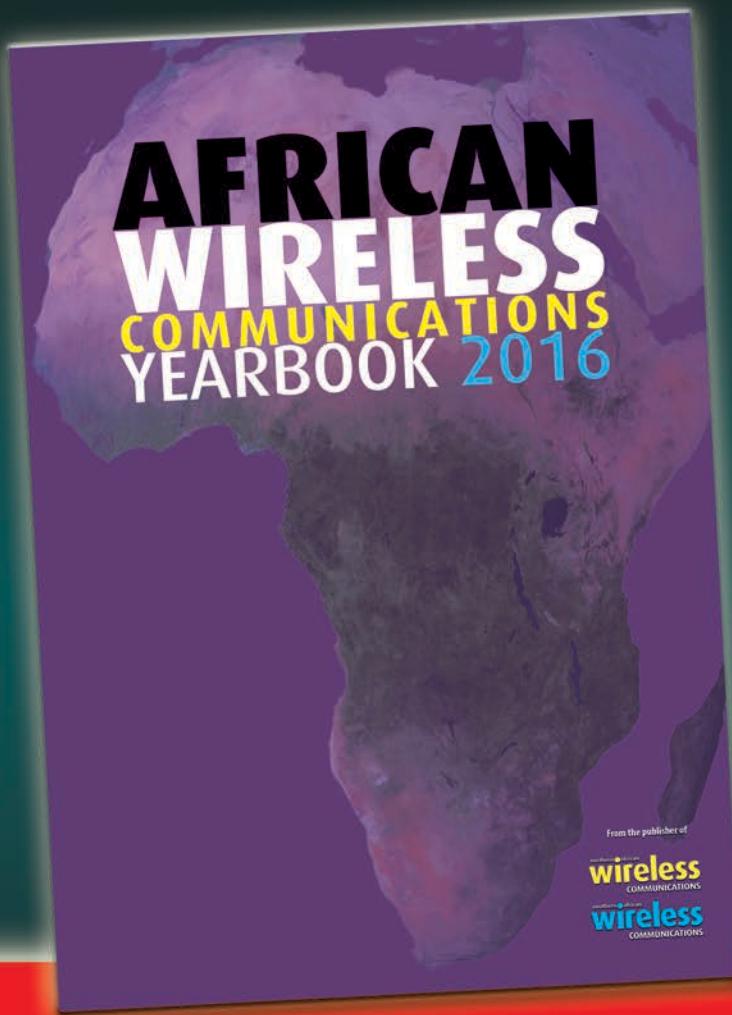
Microsoft's *Azure* cloud service. The MPS says that BWW recordings are subject to legal safeguards and guidance, and any video not retained as evidence or for policing purposes is automatically deleted within 31 days.

The evidence will be stored in the cloud within the UK after Microsoft opened two new data centres there last September. The firm says these have become part of one of the world's largest online storage infrastructures, supported by more than 100 data centres globally. It adds that these centres hold more than 30 trillion pieces of data, and are backed by billion-dollar investments it has made since 1989.

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