Q1 2015
Volume 8
Number 1

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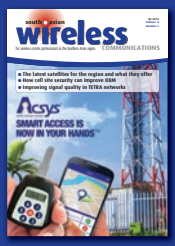

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KADIUM

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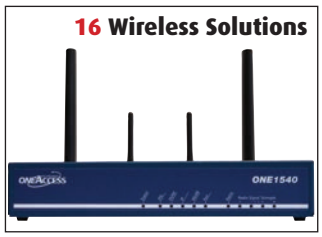

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enables a Mobile Network Operator to offer dynamically varying tariffs to their prepaid subscribers based on the analysis of available network resources, local demographics and current socio-economic conditions.

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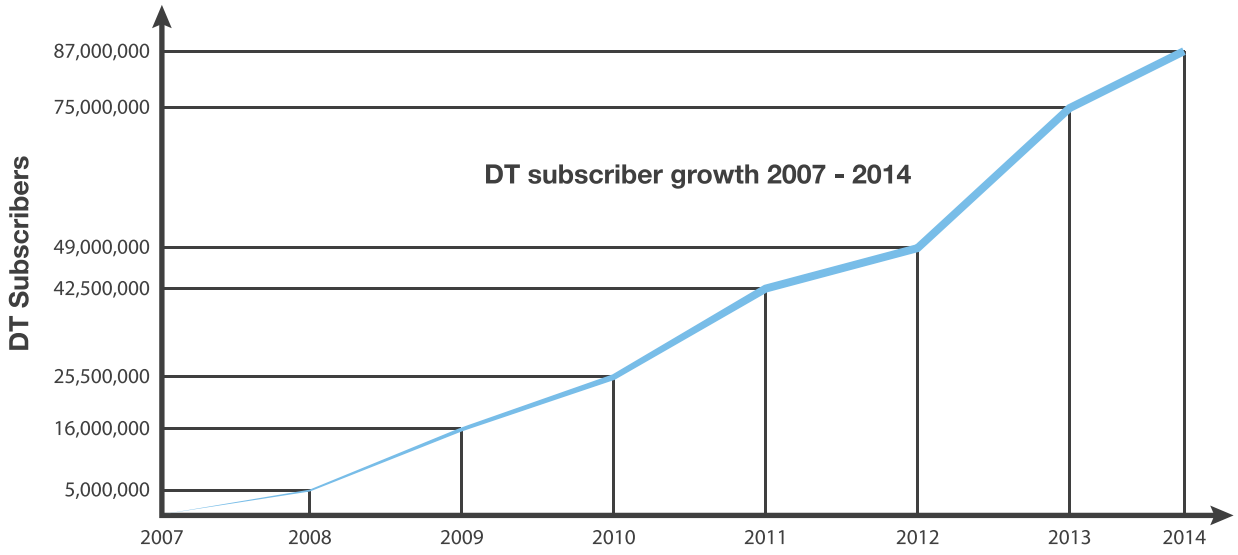
The Dynamic Tariffing™ System (DTS) works by changing the tariffs (Voice, SMS or Data) offered from cell to cell and hour to hour across the network. These tariffs are communicated directly and continuously to the customer's handset via the cell broadcast channel. This encourages existing customers to make use of mobile services when more network resources are available, and attracts new customers who cannot afford the full tariff. Conversely a premium may be charged to price insensitive customers when network resources are scarce. In this way revenue and resource yield can be optimised in a manner that suits all parties (according to classical supply-and-demand principles).

Digitata's Dynamic Tariffing™ System was commercially launched for the first time in 2007, making this the first ever implementation of a dynamic pricing product.

Offering a win-win situation for both operator and subscriber, with substantial benefits for each, DTS has proved a huge success, and has grown to touch over 87 million subscribers with deployments in some 25 networks (see graph).



With Digitata's more recent addition of functionality offering Dynamic Tariffing™ for mobile data (in addition to voice and SMS), the product will now also be of interest to a broader range of subscribers including those wanting to have more visibility and greater control of their data spend. Digitata offers this control with a user-friendly mobile app.

Digitata differentiates itself from competitors that have since entered the mobile dynamic pricing market with its extensive experience in mobile telecommunications and Dynamic Tariffing™ technology, and with the efficient delivery, implementation and support of its products.

Leveraging this experience, Digitata now offers a Guided Analytics (GA) service, providing sophisticated network and subscriber analytics. Unified network, revenue, tariff and subscriber analysis provides a near real-time and historical view of the operator's network, revenue and subscriber behaviour. GA provides segmentation of the subscriber base by revenue, time period, DT / non-DT and subscriber activity group (behaviour).

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Gemalto claims it's secure despite state-sponsored hacking revelations

Digital security specialist Gemalto says it had no prior knowledge of US and UK intelligence agencies hacking its SIM cards following revelations published on the *Intercept* website in mid-February.

According to the report, during 2010 and 2011 operatives from the US National Security Agency (NSA) and the UK's Government Communications Headquarters (GCHQ) hacked SIM card encryption keys engraved in Gemalto's and possibly other vendors' SIM cards.

Citing former NSA IT contractor and whistleblower Edward Snowden as its source, *Intercept* said the intelligence agencies had "the potential to secretly monitor a large portion of the world's cellular communications, including both voice and data".

KuppingerCole senior analyst Alexei Balaganski claims the intelligence agencies did not just resort to hacking, but also ran a global surveillance operation on Gemalto's employees and partners.

"In the end, they managed to obtain copies of secret keys embedded into SIM cards that enable mobile phone identification in providers' networks, as well as encryption of phone calls," writes Balaganski in a blog. "Having these keys, NSA and GCHQ are in theory able to easily intercept and decrypt any call made from a mobile, as well as impersonate any mobile device with a copy of its SIM card."

Neither agency has so far commented on the allegations.

Netherlands-based Gemalto is said to be the world's largest SIM maker, annually shipping more than two billion cards globally. In Q314, it reported total revenues of EUR626m (USD707m) of which its mobile division accounted for EUR331m (USD347m).

Following its own investigations, Gemalto said that there are "reasonable grounds" to believe a joint surveillance operation by the NSA and GCHQ (pictured) "probably happened" during 2010 and 2011.

In Africa, Etisalat, MTN, Safaricom, Vodacom and Morocco's Inwi are among the mobile operators that use the firm's products, while governments in several countries including Algeria, Kenya and South Africa have deployed its digital security solutions. Total earnings from Gemalto's ongoing operations across the MEA region are worth EUR273m (USD308m).

"An onion and an orange"

Following the revelations, Gemalto quickly launched an investigation and published its findings on 25 February. It said that there were "reasonable grounds" to believe that an operation by the NSA and GCHQ "probably happened". But it added that the attacks only breached its office networks and could not have resulted in a massive theft of SIM encryption keys.

"The operation aimed to intercept the encryption keys as they were exchanged between mobile operators and their suppliers globally. By 2010, Gemalto had already widely deployed a secure transfer system with its customers and only rare exceptions to this scheme could have led to theft.

"In the case of an eventual key theft, the intelligence services would only be able to spy on communications on 2G mobile networks. 3G and 4G networks are not vulnerable to this type of attack," claimed the firm.

It confirmed that it did experience many attacks during 2010 and 2011, including "sophisticated intrusions" and several attempts to access the PCs of employees who had regular contact with customers.

"At the time we were unable to identify the perpetrators but we now think that they could be related to the NSA and GCHQ operation. These intrusions only affected the outer parts of our networks – our office networks – which are in contact with the outside world. The SIM encryption keys and other customer data in general, are not stored on these networks.

"It is important to understand that our network architecture is designed like a cross between an onion and an orange; it has multiple layers and segments which help to cluster and isolate data."

According to *Intercept*, the intelligence agencies targeted mobile operators in Afghanistan, Yemen, India, Serbia, Iran, Iceland, Somalia, Pakistan and Tajikistan. Gemalto said it has never sold SIMs to four of the 12 operators listed in the documents, in particular to the Somali carrier where a reported 300,000 keys were stolen. In the case of Pakistan, it confirmed that the transmission of data between its employees and operators in the country used the highly secure exchange process at that time.

Gemalto concluded by saying it will continue to monitor its networks and improve its processes.

Meanwhile Giesecke & Devrient (G&D), which is also one of the world's biggest SIM card makers supplying more than 350 operators globally, says there is no indication that it has suffered any similar hacks.

Carolina Kehrer, a spokesperson for the German-based manufacturer, said: "As a leading provider of security solutions and services, we take every precaution to protect customer confidentiality. Our data generation takes place in high-security areas, isolated both physically and virtually from the surrounding company network. We monitor the security and integrity of these separate areas on an ongoing basis."

Singtel to develop state-of-the-art mobile networks

Singapore Telecommunications (Singtel) is continuing to develop state-of-the-art mobile networks and has announced a number of initiatives over the last few months.

Last November, it teamed up with Huawei on a joint programme for researching 5G broadband technologies, while in January it signed an MoU with Ericsson to test 5G for future standardisation.

Singtel is a member of the Next Generation Mobile Network Alliance which recently finalised a white paper that offers guidance of possible uses for 5G as well as performance requirements, network architecture, technology, spectrum and IPRs.

Singtel Group CTO Tay Soo Meng says 5G will enable Singapore's 'Smart Nation' vision in the next five to 10 years. "[It will] provide a superb wireless connectivity layer with huge capacity and solid reliability for human-to-human and machine-to-machine communications. Singtel is working towards being one of the first in the world to roll out 5G in the year 2020."

The operator will also work with Ericsson to trial Voice over Wi-Fi and video delivery using LTE Broadcast. The first test will be at the South East Asian Games in June.

And in a separate project, Singtel will use tri-band carrier aggregation (CA) technology to boost its LTE-A speeds beyond 300Mbps.

Tri-band CA (also called three-carrier LTE-A) is a step up from the current dual-carrier LTE networks used by the telco. It combines bandwidth from three of its spectrum bands to enable peak downlink speeds of up to 450Mbps.

SMS-based system can warn of impending natural disasters

The tsunami that struck the Indian Ocean region in December 2004 was the world's worst-ever natural disaster. It affected 18 countries, claimed more than 250,000 lives, and left 1.7 million people homeless.

A warning system that uses mobile phones to alert millions of people about impending perils such as tsunamis, typhoons and earthquakes has been launched in India.

The system, commissioned by the Indian government, will be able to send warnings via SMS to all those living in Indian Ocean countries. It is based on technology developed by the Indian National Centre for Ocean Information Services (INCOIS) and RegPoint, a UK-based health services company focused on bringing wireless technology to the global health care community.

According to RegPoint, as soon as there is an earthquake, INCOIS can identify its location and depth and accurately predict within 10 minutes how high and what time the wave will hit the shore. The analysis is carried out at the tsunami centre in Hyderabad using hundreds of buoys that have been placed in the Indian Ocean and thousands of models that have been developed based on a variety of tsunami scenarios.

RegPoint's service has the ability to send SMS messages immediately to all mobile phones in a designated locality, pinpointing precise warnings, guidance, or other information to a specific region using data provided by INCOIS. Messages can be sent in any language.

Locals or tourists in India can register for the service by going online or at street stalls in coastal towns, cities and villages. They will simply have to provide their address, mobile number, and preferred language.

The deployment of the system comes 10 years after the devastating tsunmai that struck the Indian Ocean region in December 2004. It was the world's worst natural disaster, claiming the lives of more than 130,000 people in Indonesia, as well as tens of thousands in Sri Lanka, India and other countries. Around 7,000 tourists, mostly from Europe, also lost their lives.

The tsunami hit without any warning and, at the time, the only means of alerting people about the impending disaster was through World War Two-style sirens. But although internet connection was lost in many of the affected areas, the ability to send text messages using SMS remained.

AsiaInfo transforms BSS in Nepal and Thailand

AsiaInfo says it has transformed billing for mobile operators in Nepal and Thailand.

In February, the China-based telecoms IT supplier announced a BSS transformation project with Nepal Satellite Telecom (NST), and claimed its upgrade helped the operator double its subscriber base.

NST owns the Hello Nepal mobile brand and became the country's third mobile operator in 2009. With the expansion of its network across Nepal and into the major cities, it needed a BSS that could support its growth and enable the launch of new and innovative services for its customers.

Work is currently under way on the project and covers the integration of *Veris*, AsiaInfo's fully convergent telecom billing and charging system. The BSS suite includes an online charging system, voucher management system for mobile phone top-up and payments, settlement and interconnect, and a CRM platform.

AsiaInfo says Hello Nepal previously had around 150,000 subscribers but since the deployment of its BSS platform this number increased to 300,000 in just four months. It reckons *Veris*' greatest strength lies in its "innovative" real-time capabilities which enable pre- and post-paid users to be served by a single billing system, and provide "great flexibility in pricing".

SDP helps PT Telekom deliver new services

PT Telekomunikasi (Telkom) has upgraded its communications service delivery platform to enable the rapid roll out of new mobile, broadband and network services in Indonesia.

The operator is said to be the largest telecoms and network service provider in the country. Since 2013, it has used a service delivery platform (SDP) from Oracle Communications and has now updated this to the latest versions of the vendor's *Converged Application Server* and *Services Gatekeeper*.

Telkom plans to use these to implement a new range of products and services such as SMS push alerts, content downloads via the cloud, and mobile payments. Oracle says its converged application server will enable the operator to introduce these new features and extensions to its existing IP-based communication services "quickly and cost-effectively".

The firm goes on to claim that *Gatekeeper* will allow Telkom to more easily create unique content and user experiences. It says the solution also helps manage and control third-party network access and usage, enabling the operator to more easily work with external developers.

Oracle adds that its SDP products will give Telkom a faster time to market for new applications, improve opex, and support its ongoing commitment to innovation.

Telekom Malaysia hopes to get core network timing right

Telekom Malaysia is testing its core network for timing and phase synchronisation as it gets ready for major growth.

The operator has been working closely with Swiss-based specialist Oscilloquartz. Under a three-year framework deal, the two have carried out several months of rigorous testing in Telekom Malaysia's lab facilities to ensure that Oscilloquartz's technology will enable the network to rapidly respond to growing customer demand for applications with specific timing needs.

Oscilloquartz's management software together with its point-to-point *Grandmaster* and remote slave clocks now provide Telekom with a complete end-to-end timing solution and the opportunity to develop new revenue streams. Oscilloquartz says the timing solution is key to operational simplicity and ease of use.

It adds that it will become a critical component of Telekom's national core network as it prepares for increased demand for its LTE-A services and other applications that require accuracy in the delivery of frequency, phase and time-of-day information.

Oscilloquartz's PTP *Grandmaster* and remote slave clocks provide Telekom with a complete end-to-end timing solution and the opportunity to develop new revenue streams.

Oscilloquartz will be working with its long-term partner Telechat Communication to deploy and maintain the technology throughout the operator's national network footprint.

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Ultrafast 4G launched in India's first FDD-LTE network on 1800MHz

In a deal that marks India's first FDD-LTE deployment using the 1800MHz spectrum, Bharti Airtel has commissioned Nokia Networks to expand its 4G services to six new circles.

The deployment will include the roll-out of small cells to improve capacity and coverage in dense areas, and will use the vendor's *Flexi Zone BST* which is claimed to be the world's smallest high capacity LTE picocell.

Nokia will also supply its *Flexi Multiradio 10* BST which it describes as a software-defined radio platform that can be flexibly configured to increase network capacity depending on data consumption.

In addition, Bharti will take advantage of the Finnish company's professional services such as network planning, optimisation and implementation, systems integration, hardware care, and cloud-ready *NetAct* system for consolidated management and monitoring of its LTE network.

In a separate deal, Nokia is also helping TATA DOCOMO expand its 3G network in India with an upgrade to HSPA+ in Karnataka, Haryana and Punjab. TATA will also use a *Flexi Multiradio 10* BST with HSPA+ technology and radio network controllers along with Nokia's *Flexi Lite* base stations for enhancing capacity and providing best coverage in densely crowded areas.

Bharti Airtel and TATA are both using Nokia's software-defined *Flexi Multiradio 10* base station to expand their data networks in India.

According to Nokia's latest *MBiT Index* report, 3G in India grew by 156 per cent year on year in 2013, which is higher than the world's average.

However, the report points out that 3G coverage in India is limited. It says that on average in several circles, there is a 20-25 per cent coverage gap between 2G and 3G which, if bridged, could help in delivering even stronger mobile data growth in the country.

H3I's rising subscribers lead to BSS upgrade

Hutchison 3 Indonesia (H3I) will expand its use of a CSG billing platform to support a projected uptake in subscribers in the country's high-growth market.

CSG says it will support H3I's "aggressive" subscriber growth through an upgrade of its *Singleview* convergent billing platform. The company says the solution will operate on cost-effective blade technology to further optimise the operator's total cost of ownership.

The platform itself has been designed to deliver fully convergent billing for all services and payment types from a single platform. CSG says *Singleview* offers fully integrated modules for rating, discounting, bill production, and real-time processing to protect against error and fraud.

H3I operates 3G/WCDMA and 2G services and is currently expanding its HSDPA coverage across Indonesia. The operator is a subsidiary of Hutchison Asia Telecom and a member of the Hutchison Whampoa group which has mobile operation in several countries including Hong Kong, Macau, Sri Lanka and Vietnam in Asia.

Enhanced services for Airtel Lanka users

Airtel Lanka has teamed up with Celltick to provide a new interactive service for its 1.7 million subscribers in Sri Lanka.

Celltick will supply its patented *LiveScreen* platform to the Bharti Airtel subsidiary. The managed service is designed to deliver location-based information and is said to provide ease of access to relevant content, service discovery and mobile coupons for physical goods that can be redeemed in store.

Airtel Lanka has branded the new service as *Airtel Now!* It enables subscribers to discover and take advantage of various value-added services directly on their handset's home screen. They can benefit from services that offer advice, trivia, factoids, quizzes, contests and more with the convenience of a click.

Celltick reckons its platform has a unique capability to segment Airtel Lanka's customers, targeting millions of mobile subscribers based on location and user behaviour.

"*[Airtel Now!]* introduces a mass market service that delivers content and services to the mobile home screen of our consumers using a simple interactive medium," says Airtel Lanka CEO Suren Goonewardene. "The partnership enables us to realise our vision of delivering innovative services that provide personalised content and information to our subscribers."

Celltick's aim is it to enable partners to engage with their customers and monetise their device home screens. It claims it powers billions of mobile-initiated transactions for virtual and physical goods serving more than 150 million consumers in 25 countries.

Earlier this year, the company teamed up with Airtel Lanka to launch *Start*, its next-generation, personalised and intelligent *Android* interface.

PLDT uses satcoms to expand connectivity

PLDT (Philippine Long Distance Telephone), the largest telco in the Philippines, is boosting both its local and global connectivity using satellite technology.

Delnet International will use Gilat Satellite Networks to provide a Ku-band *SkyEdge II* VSAT network for PLDT. The Manila-based company specialises in maritime communications but is increasingly focusing on the land and satcoms markets in the Philippines.

It will use a Gilat *SkyEdge II* hub that was previously installed at an Earth station in Pampanga and operated by PLDT-subsidiary CIGNAL, a provider of DTH services. Gilat will also supply *SkyEdge II Access* for PLDT's IP VSAT network. This is an IP-based access solution that enables enterprise markets to extend data to remote sites that cannot be reached via terrestrial and fixed wireless solutions.

Gilat will supply its *SkyEdge II Access* appliance for PLDT's IP VSAT network.

The vendor says its system supports AGC (auto gain control) to address rain fade in the Philippines' tropical environment, with each *SkyEdge II* VSAT adapting individually and automatically to weather conditions to ensure high availability at remote sites.

"Our IP VSAT solution is an important addition to our service offering, ensuring ubiquitous last-mile access to enterprise customers," says Eric Alberto, PLDT's EVP and head of enterprise, international and carrier business. "This partnership with Gilat and Delnet, combined with PLDT's own network capabilities, further boosts our coverage and enables us to provide connectivity and access where these are needed the most."

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Jongla expects Asia IM boom

Jongla has launched what it claims is the world's lightest messaging app to address the fast-growth markets in India and South East Asia.

Jongla Lite is a 2.7MB version of the Finnish developer's multi-platform IM app, and is available as a free download from the the Apple, Firefox, Google and Windows Phone app stores. It is designed for markets with limited telecoms infrastructure and for devices with low-capacity memories.

According to the firm, engineering innovations have made *Jongla Lite* on *Android* around 15 per cent of the size of its nearest competitor and a tenth of the size of the average IM app. Jongla reckons this advance gives it a "significant advantage" in markets such as India and South East Asia where low cost phones are commonplace and there is limited access to 3G and 4G networks.

To accommodate an anticipated grwoth in the number of users, Jongla has also announced the completion of a major upgrade to its server infrastructure along with a move to an increased number of servers distributed around the world. It claims all this has resulted in improved speed, security and capacity of its network which can now support up to 320 million users and is easily upgradeable.

The company has a series of further product developments planned, including an app that works on 'intelligent' devices such as smart watches, and new interactive stickers designed specifically for the market in India.

Jongla says it already has a growing user base in India where there is "huge" potential demand for high quality instant messaging, and hopes that *Jongla Lite* will make such services accessible to everyone.

"We believe that the new version of the app will also appeal beyond markets where we have recently been enjoying great success, like Thailand and Indonesia, but also to younger users across the world who will often have very low specification phones," says CEO Riku Salminen.

Carrier's carrier upgrades to 100G in Malaysia

Fiberail has upgraded its backbone network and says it is now ready to offer capacities of up to 100G capacity to service providers in Malaysia.

Describing itself as a "carrier's carrier", Fiberail provides backbone infrastructure and ancillary services to telecoms operators. It was setup in 1992 as a joint-venture between Telekom Malaysia Berhad, KTM Berhad and Petrofibre Network.

The company worked with packet optical networking specialist Transmode and local partner Nera Networks on the upgrade. At its core is Transmode's recently announced *EMXP 220 IIe* packet-optical transport switch which provides both 10G and 100G ports, and a central *220G* switch to deliver wire-speed switching.

According to the vendor, the *EMXP 220 (pictured right)* provides 10G networking for Fiberail today and a future 100G upgrade via the simple addition of CFP pluggable optics.

The firm says that one of the advantages of the new network is that it includes Ethernet Ring Protection v2 which provides a "very robust" and scalable Ethernet network. It also supports both Layer 1 and Layer 2 packet optical applications, and is said to uniquely provide end-to-end Ethernet service provisioning across the Transmode network and third-party Layer 1 optical equipment via 'alien wavelengths' to other parts of Fiberail's network.

"By combining the best of the optical and Ethernet worlds, it enables the carrier to turn on MEF Carrier Ethernet 2.0 services as well as, MPLS-TP and OTN transport ensuring high service performance and scalability," says Transmode.

Astellia optimises networks in the region

Astellia, the France-based provider of network and subscriber intelligence for mobile operators, is helping two major cellcos in the region optimise their networks.

In February, the firm announced Smart will use its *Service Management Platform* for 2G and 3G networks in the Philippines. Through a set of personalised dashboards, Astellia says it will provide a "comprehensive" real-time view of the operator's network quality and service usage. The platform will be used on a daily basis by more than 50 staff to investigate customer complaints and take proactive measures.

Astellia's experts will also be on site to ensure the transfer of skills and knowledge to Smart's service quality, operations and customer care teams.

This latest deal for the vendor follows the signing of a multi-million-dollar contract with Aircel in India last December. The operator will optimise its 2G and 3G radio access and core network resources using the vendor's *Nova* suite. The software will enable it to detect issues that could cause network quality degradations and take prompt remedial actions.

It's claimed the optimisation will allow Aircel to further strengthen its opex and capex strategies. Astellia will also leverage customer analytics to help the cellco understand and predict usage trends across its base of more than 75 million customers, optimise existing data plans or introduce new ones, address churn, and optimise ROI.

Better performance at Singapore theatre

Singapore's national performing arts centre has migrated its communications system from analogue to digital technology.

Esplanade – Theatres on the Bay has upgraded its existing intercom system using hardware from US-based broadcast intercom specialist Clear-Com which claims it was the first to market portable wired and wireless intercom systems for live performances.

The centre's previous analogue system was constantly producing humming and buzzing noises which were audible and, at times, affected the quality of some quieter performances.

Clear-Com says the deployment of its digital system has now eliminated such interferences. The firm installed the *HelixNet Digital Partyline* system, as well as its *Eclipse HX Median* and *HX PiCo Digital Matrix* intercom systems.

Esplanade – Theatres on the Bay, in Singapore, is using new systems from Clear-Com that integrate seamlessly with its FreeSpeak wireless intercom platform.

PHOTO: Hidetaka Mori, courtesy of Esplanade Theatres on the Bay

The new equipment is said to integrate seamlessly with Esplanade's *FreeSpeak* wireless intercom system. In combination, the Clear-Com solution enables clear communication throughout the facility which comprises the Esplanade Concert Hall, Theatre, Recital Studio and Theatre Studio.

"We chose the new Clear-Com digital system for its clarity and cost-effectiveness, and also because it could run on our existing infrastructure using Ethernet cable," says Robin Shuttleworth, technical manager at The Esplanade Co. "This was crucial to us, as it allowed us to 'recover' intercom points throughout our venues that we otherwise would have had to set up new infrastructure for."

Syniverse delivers global mobile messaging service

Subscribers of Grameenphone Bangladesh will soon be able to utilise Syniverse's global mobile messaging services as a result of a deal between the two companies.

Syniverse claims its SMS and MMS interoperability solutions will enable Grameenphone customers to take advantage of "seamless" messaging experiences across geographic and technological borders.

The company adds that its messaging services also enable the operator to access real-time message delivery information and reporting, as well as enhanced network security, filtering and spam controls.

Grameenphone customers will soon have seamless messaging across borders as a result of Syniverse software.

"Syniverse messaging solutions unravel the costly complexities associated with globally managing and delivering reliable, high-quality mobile SMS, MMS and video communications," says Sanjay Kasturia, Syniverse's VP and MD of sales for India.

This latest contract builds on a decade-long strategic relationship between the two companies under which Grameenphone has deployed Syniverse's critical roaming solutions, including its *Data Clearing House* and *DataNet* near real-time roaming data exchange solutions.

Grameenphone, which is part of the Telenor Group, has 50 million subscribers in Bangladesh. It claims to have the largest cellular network in the country, covering nearly 99 per cent of the population.

Telkomsel chooses Ericsson OSS solution

Telkomsel has selected Ericsson's OSS software to run its services in a deal that extends the two companies' long-standing relationship which covers a broad range of network hardware, software and consulting services.

Telkomsel is the largest mobile operator in Indonesia. It says Ericsson's OSS will help consolidate its network operations centre with end-to-end visibility and control over a wide geographical area.

The telco had been looking for a comprehensive OSS transformation to help it meet new customer demands and efficiently manage rapid network growth. As a result, it decided to deploy a broad range of solutions from the Swedish vendor.

Ericsson's *Consulting and Systems Integration* is an important component of the transformation planning and consolidation of Telkomsel's network operations centre. It also provides OSS solutions for fault and configuration management, service fulfilment and service quality management.

Paulus Djatmiko, vice president of network operation management at Telkomsel says: "As we grow our network to address fast-evolving mobile trends and capture new opportunities, it is imperative that we move with speed and efficiency.

"Our latest work with Ericsson ensures that, as we expand, we remain nimble with the support of solutions that give us the best flexibility and control in delivering the excellent service our customers expect."

The legacy OSS solutions previously used by Telkomsel will be replaced by Ericsson's *Experience Manager*, *Granite Inventory* and *Discovery* platforms.

NTT links Singapore and Japan markets

In what's being described as an "unprecedented service", NTT will use its Asia Submarine Cable Express (ASE) fibre network to connect financial markets in Singapore and Japan.

NTT claims its *JPX-SGX Co-Location Direct* service will provide the lowest-latency connection between the Japanese Stock Exchange (JPX) and the Singapore Stock Exchange (SGX), enabling high-frequency traders to save costs and increase competitiveness.

The service will start from April 2015. According to NTT, it is in response to increasingly complicated market structures and changes in financial regulations. It says these are compelling high-frequency and algorithmic traders to seek the fastest connections to principal exchanges worldwide.

NTT adds that no other telco will be required because it will use its own ASE and data centres in Japan and in Singapore, including on the SGX colocation floor.

Ryusuke Yokoyama, an executive officer of the Tokyo Stock Exchange, says JPX and NTT Com have a well-established relationship as partners supporting Japanese market infrastructure with the necessary network and data centres.

"Investors will benefit from enhanced connections between JPX and foreign exchanges through NTT Com's robust resources, including low-latency global cable networks, data centres that are in proximity of foreign exchanges and offer connectivity to multiple markets, and strong local working relationships in markets worldwide."

NTT says it has been providing solutions for one-stop, super-low-latency connections between JPX and North American and Asian locations since April 2013, working in collaboration with Arrownet-Global, a service that directly connects the JPX colocation service and foreign exchanges.

Redknee on Vodafone

Redknee Solutions has won a contract with Vodafone India to manage its pan-India active pre-paid and post-paid data subscribers. Vodafone will be using the real-time monetisation and subscriber-management software specialist's *Unified Charging* and customer care solution. This will enable self-service via the web and smart devices, as well as engagement with customers via social media. Vodafone India says Redknee's solution can provide personalised data services and differentiated tariff and price options to enhance the customer experience.

IP and OTT innovation

ZTE has set up an innovation centre with Telkom Indonesia to develop IP-based video technologies. The centre will bring ZTE's expertise in IPTV and OTT solutions together with Telkom's capabilities in mobile, fixed, networking, broadband and data communications services. Telkom operates the *IndiHome* broadband internet service. Meanwhile, ZTE's IP-based video systems currently serve more than 26 million active users. This latest agreement between the two companies is said to strengthen an already existing strategic partnership.

Advantech VSAT deal

Advantech Wireless has made a deal with an unnamed South East Asian operator to supply two VSAT *Discovery Hubs* to create a nationwide IP-based communications network. One will operate in C-band using two separate forward links and the *Advantech Wireless Multi-Carrier Demodulator*. It is said to enable future expansion to up to 96 carriers without any hardware changes. The second hub will be deployed in Ku-band to operate simultaneously in star and mesh (direct remote to remote connectivity) modes.

Security AND Productivity

21st Century Solutions to 21st Century Problems

All tower companies and mobile operators face the challenge of preventing theft and unauthorized access to their infrastructure. The more remote the location, the more difficult the challenge.

The most common solution has been mechanical locking systems. The problem is, these systems create numerous management headaches including copied keys, lost/stolen keys, the frequent need to replace locks, where the process itself can be far more expensive than the cost of the original locks, and the need for trained and trustworthy staff to manage all these keys, which may number in the tens of thousands.

A switch to combination locks was thought to be a solution. They are not, as combination locks create an increased security threat; namely who knows the combinations at any given time? Should all combinations be changed every time staff leave?

In the age of Big Data, management has never put more value on generating and analyzing critical data in their operations. Mechanical systems cannot meet the data demands of the 21st century. Thereby, the industry has begun searching for other solutions. These usually consist of:

- Wired Systems - Why not deploy the same smart card based access control systems used in the office? The problem is, these systems are not designed for remote, outdoor environments. The installation alone may cost from 2-5 times the price of the hardware and necessitate major changes to site infrastructure. Installation may then require skilled technicians on-site for days at a time. If this is scaled across an entire network, deployment time alone is unrealistic. Then there is the maintenance involved. The costs and complexity likely outweigh the benefits of the technology.

- Battery Powered Readers – An alternative is to install wire-free readers, especially Bluetooth-based systems. While this eliminates the need for large control panels and trenching, it also means that the system is dependent on batteries. We all know that batteries fail and must be replaced periodically, requiring a new workflow simply to maintain the readers. What some may not realize is, because of the battery issue (which are installed inside of a door), these systems feature mechanical-lock over-rides. Now a hi-tech solution suffers from the same security weaknesses of a mechanical one – picked or bumped locks, lost/stolen keys, and the ability for users to enter sites undetected through these keys.

– It is important to note, that with both these systems, not all assets can be wired or installed with readers. How to expand the system to monitor access to assets like generators and front gates?

We have gone to great lengths in designing solutions that take these challenges into consideration. By deploying electronic, programmable locks and keys, intelligence is added to the same kind of padlock or cylinder lock already deployed on sites. Critically, the locks are completely wire and battery free. These solutions offer rapid deployment – all that is required is a screwdriver and 10 minutes at a site. Any asset can be secured, thus one solution can monitor vendors from the front gate to the generators to the LTE and BBUs. Operators and towercos can now gain control and data anywhere with minimal headaches.

The next challenge is to offer Real Time control and monitoring with a power independent system. In our solutions, users on-site enter a random code which offers them access only to the assets required in their service ticket and only for the time they need. This single-usage code is generated by a software which is sent to the user's phone.

In the developing world where many technicians do not own smart phones, needless to say data plans, it is essential that this kind of solution can also function on a basic phone. Another critical factor is redundancy, our system implements real-time control and data in such a way as to function regardless of if power is down at the site itself.

The demands for security are only increasing. The demands for productivity are increasing alongside it. An ideal solution will enhance both synergistically. At the same time, we must be realistic. Human resources, budget, operational architecture, and time must all be considered. Let us show you how we can work under your constraints to dramatically increase security and productivity.

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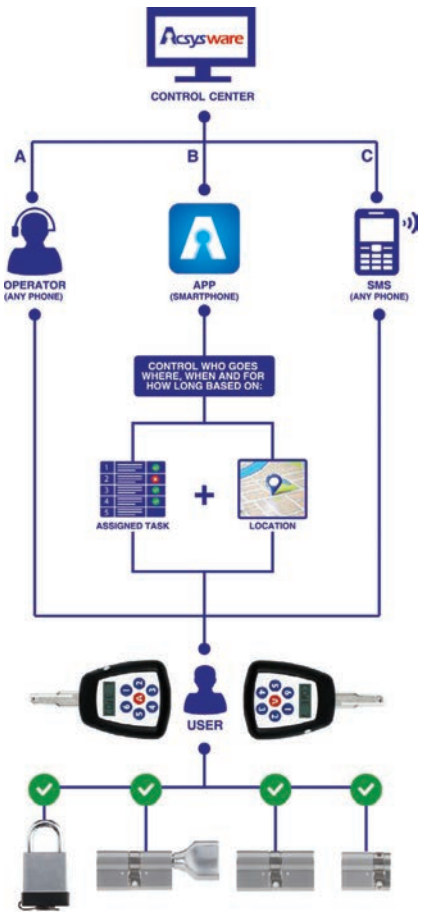


High prices in Indian spectrum auction draw fire from GSMA

In January, India's Department of Telecommunications (DoT) announced plans to auction 20-year licenses for MNOs to operate services at 1800MHz in 15 circles, 900MHz in 17 circles, and 800MHz in 20 circles.

At the time of writing in early March, the first rounds of the auction process were already underway with bids so far exceeding USD15bn.

The government reportedly wants to raise INR648.4bn (USD10bn) from the sale. Reserve prices are set at: INR21.91bn per MHz in the 1800 band (excluding Maharashtra and West Bengal); INR39.8bn per MHz for 900MHz (excluding Delhi, Mumbai, Kolkata and Jammu and Kashmir where frequencies are unavailable); and INR36.46bn per MHz for the 800MHz band.

Tom Phillips, the GSMA's chief regulatory officer, believes high auction prices will delay investment in India's mobile infrastructure.

Spectrum at 2100MHz is also being sold. While DoT plans to announce more details about these at a later date, the GSM Association has criticised a decision by the country's Telecom Commission to increase the reserve prices for these frequencies to almost 36 per cent higher than those recommended by the Telecom Regulatory Authority of India (TRAI).

The association is also concerned by government proposals to only offer for sale 2 x 5MHz in the 2100MHz band, as opposed to auctioning at least 2 x 20MHz as per its joint recommendation with TRAI.

Tom Phillips, chief regulatory officer for the GSMA, said: "While high auction prices may generate short-term revenues for the government, in the longer term they will negatively impact the development of India's mobile networks and delay investment in infrastructure, resulting in higher retail prices and an inferior mobile experience for consumers."

He added that it is now well documented that mobile broadband has the potential to deliver substantial socio-economic benefits. According to GSMA Intelligence, the overall economic impact of mobile technology in India last year amounted to around USD115bn in value-added terms, representing an economic contribution of around 5.5 per cent to GDP.

By the end of 2014, 3G coverage reached 61 per cent of the population and is predicted to reach 90 per cent by 2020, according to GSMA research. Similarly, while 3G and 4G connections only represented 11 per cent of all mobile connections by 4Q14, it says this will increase almost four-fold to 41 per cent by 2020.

"These forecasts will only become reality if mobile operators have the capacity to make the necessary network investment in India," warns Phillips. "There is still time to lay the foundations for a truly Digital India that will benefit the lives of citizens and businesses."

LTE threatens fibre take-up in Asia

Asia Pacific is by far the largest region for the adoption of FTTH (fibre-to-the home) and FTTP (fibre-to-the-premises) services, according to the latest study from Pyramid Research. But it adds that the introduction of LTE networks has slowed down APAC's momentum for fibre adoption.

Pyramid says the region accounted for 68 per cent of the world's FTTH/P lines in 2014. While most of the subscriptions are concentrated in more developed Asian countries (such as Hong Kong, Japan and Korea, where more than 60 per cent of broadband subscriptions are via fibre networks), it says deployments are "mushrooming" across APAC.

Singapore and Taiwan are close to completing nationwide fibre networks, while deployments are also underway in Australia, China, Indonesia, Malaysia, New Zealand and Vietnam. China alone plans to have 200 million fibre-passed homes by the end of 2015.

Pyramid analyst Malcolm Rogers says: "The majority of internet accounts in Asia will be fibre optic within the next five years, largely due to government involvement and regulation reducing financial risks for service providers. This will encourage the spread of high-speed broadband networks and a competitive marketplace in Asia Pacific."

But the firm goes on to point out that increasing availability of LTE has adversely impacted demand and investment in FTTH/P networks in the region. For example, it says operators in Japan and South Korea had to respond with price cuts of as much as 30 per cent and offer fixed-mobile bundles to customers when their fibre net additions declined significantly following the introduction of LTE services.

"While LTE can effectively compete with fibre broadband for connectivity services in certain segments such as youth and low-income customers, there are significant opportunities for fibre elsewhere such as pay TV services, enterprise/cloud applications, and wireless backhaul," advises Rogers.

The "ultimate 'mobile-first' nation"

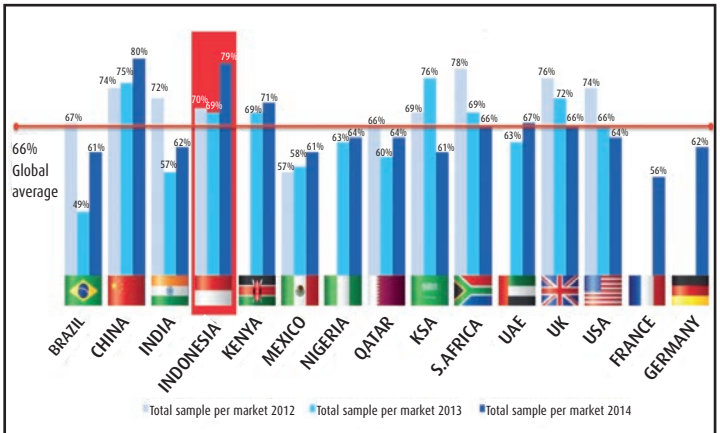
Consumers in Indonesia are the world's "most enthusiastic" mobile users, according to MEF, the global community for mobile content and commerce. In a recently published country report, the organisation said they "buy more, spend more, and do more" with their mobiles than almost any other market.

Indonesia is the largest economy in South East Asia with annual growth of around six per cent. Its expanding mobile subscriber base of more than 278 million active customers dwarfs the fixed line market of just nine million connections. Many people own two or even three handsets and often use the same number of SIMs.

Mobile data is the only viable means of connecting to the internet in Indonesia. In a previous study, MEF said that the country had 115 million data users in 2012, each spending 30 per cent of their mobile bill on mobile internet services. Data revenues have therefore surged for Indosat, Telkomsel and XL, the country's leading mobile operators.

MEF also found that mobile users in Indonesia tend to spend more heavily than the global average. For instance, the use of debit/credit cards tripled in 2014, further emphasising mobile's growing maturity as a platform. Direct billing also grew by almost two-thirds, while airtime transfer is the favourite method of payment.

"There's no doubt mobile businesses benefit from operating in a mobile-first economy. A fifth of mobile media users say they purchased via mobile because 'it's the only way to buy online' whereas around the world it was half that number," said the report.



Mobile content and commerce growth by market. Seventy-nine per cent of Indonesians surveyed made some kind of purchase in 2014, up from 69 per cent in 2013. This 15 per cent year-on-year growth was exceeded only in Brazil (24 per cent), which benefited from a surge in World Cup-related business. SOURCE: MEF COUNTRY REPORT INDONESIA

Furthermore, MEF said that Indonesia's growth in mobile banking was unsurpassed last year. It outperformed its Asian neighbours with the number of people banking on the move increasing by 33 per cent to four in every five mobile users.

However, and in common with other countries around the world, the organisation warned that a lack of trust is potentially holding back mobile services in the country – a third of mobile users cited this as the single largest barrier to growth.

Myanmar government plans to launch its first satellite

Myanmar's government has outlined plans to launch its own satellite within five years.

Speaking at the country's inaugural *Satellite Forum* held in Yangon last November, deputy minister of communications and IT, U Thaung Tin, said the national priority is for Myanmar to have its own satellite while at the same time opening the market to enhance the development of the broader ICT industry.

"Although there is no timeline for the launch of a satellite, the selection process will follow that of the international mobile licenses, with an open, fair and transparent tendering process, followed by public consultation," he said.

The forum attracted major support from international satellite operators, manufacturers and launch providers. Among the big name companies at the event were ABS, Arianespace, Eutelsat, Hughes and Intelsat, amongst others. They discussed a wide range of topics such as the role of satellite technology in digital villages and community access points, broadband as a stimulus for economic development, e-government services, backhaul, enterprise connectivity, etc.

As well as announcing its support for a national satellite programme, the government is also planning to liberalise the local market. It aims to increase Myanmar's teledensity from around 20 per cent in 2014 to 75 per cent during the 2015/16 financial year.

"With the deregulation of the broadcasting market, the preparation of a broadband masterplan, and the launch of unlimited ISP licenses, many new opportunities are in the pipeline," said Tin.

VimpelCom backed by Chinese banks

VimpelCom has signed a new USD1bn credit facility with Bank of China and the China Development Bank (CDB).

Announced last November, it has a tenure of eight years and is unsecured but guaranteed by VimpelCom Amsterdam B.V. It is in addition to the USD0.5bn credit facility signed with the CDB in December 2012.

The credit will be used to fund capex for the telco's various subsidiaries. The Russian operator's mobile operations in Asia include Banglalink in Bangladesh, Beeline in Laos, and Mobilink in Pakistan which it runs with its subsidiary Global Telecom Holding.

DragonWave updates revenue expectations for 4Q15

DragonWave, the Canada-based microwave radio systems specialist, has revised its revenue expectations for 4Q15. It now anticipates earnings of USD44m for the quarter which is lower than previous forecasts.

The company blames the "uneven" timing of installation services revenue, shipments that did not make the 4Q cut off, and delays in equipment orders which are now expected to be received during the 2016 fiscal year.

Revenue for the 2015 financial year is expected to be around USD158m which represents YoY growth of approximately 75 per cent.

DragonWave adds that its updated revenue expectations, which were made public at the beginning of March, are preliminary and have yet to be reviewed by its external auditors.

WiTribe in Pakistan and Reliance Jio in India are among the company's customers in the region.

Newtec notches up three decades of satellite innovation

2015 marks Newtec's 30th anniversary. The Belgium-based

LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
13/1/15	Huawei	China	FY14	CNY	287 (bn)	29.4 (bn)	NA	The telecom networking giant became the third-largest smartphone maker last year, & is now said to be the largest telecoms equipment manufacturer in the world.
19/1/15	ZTE	China	FY14	RMB	81.24 (bn)	NA	0.77	Full-year profits almost doubled last year. Has high hopes for its Blade S6 smartphone over the coming 12 months & aims to dent Apple's market share.
19/1/15	M1	Singapore	FY14	SGD	1,076.3	NA	11.9	Mobile revenue grew 4.2% to SGD671.1m due to higher post-paid usage. Mobile data continued to grow, with revenue from non-voice services increasing 5.7 percentage points YoY.
27/1/15	Ericsson	Sweden	FY14	SEK	22.8 (bn)	15,811	3.54	Sales decline in North America of -8% was compensated for by growth in the Middle East, Europe & Asia.
29/1/15	Nokia	Finland	FY14	EUR	12.7 (bn)	NA	0.14	2014 was a milestone year for the firm as it restructured under its three new divisions: Networks, Technologies & HERE.
5/2/15	Vodafone	UK	3Q14	GBP	10,881	11.9 (bn)	NA	Continued momentum in MEA & APAC but tougher conditions in Africa. Group service revenues outside Europe were GBP3.06m.
12/2/15	Singtel Group	Singapore	3Q14	SGD	4.43 (bn)	1.23 (bn)	NA	YoY revenues up 4% driven by mobile customer growth, higher equipment sales & earnings from recent digital acquisitions. In constant currency terms, revenue would have grown 7%.
18/2/15	Gilat Satellite Networks	Israel	FY14	USD	235.1	23.4	NA	Is targeting revenues of between USD255m & USD260m this year in growing markets such as HTS, mobility & backhaul.
20/2/15	SES	Luxembourg	FY14	EUR	1,919.1	1,428	1.18	Aims to capitalise on future growth with recent announcements of SES-14, SES-15 & SES-16/GovSat programmes.
20/2/15	CommScope	US	FY14	USD	3.8 (bn)	NA	2.05	Wireless sales increased significantly in North America, Asia-Pacific & Europe as a result of 4G/LTE rollouts in developed markets & 3G coverage buildouts in emerging markets.
25/2/15	Global Telecom	Egypt	FY14	USD	3.28	1.43	0.44	YoY revenues for Mobilink in Pakistan down 1% (due to lower VAS sales), while Banglalink in Bangladesh is up 13%.

company has already begun the celebrations with the announcement of significant sales growth and expansion into new markets.

Founded in 1985 by two engineers, Jean-Marie Maes and Dirk Breynaert (who is the current CTO), Newtec specialises in designing, developing and manufacturing satcoms equipment and technologies.

The firm has a strong reputation for R&D which it says has resulted in an "extensive" portfolio of innovations, partnerships and standardisations for broadcast, government, defence, IP trunking, consumer and enterprise VSAT.

Over the last several years, Newtec says it has "performed strongly" in its core markets which include DTH and broadcast systems. It cites the consumer and enterprise markets as key drivers for its success in 2014 which saw a 20 per cent sales growth.

The company plans to continue its focus on these areas but also aims to place a stronger emphasis on fast growing markets such as HTS, oil and gas, and cellular backhaul.

IN BRIEF...

Reliance Communications has signed a seven-year managed services deal with Ericsson. Under the contract, the vendor will operate and manage Reliance's wireline and wireless networks across India which include more than 150,000km of fibre as well as 2G/3G/CDMA in 22 circles including Delhi and Mumbai. Ericsson will also work closely with the operator to identify opportunities to introduce new services and expand its businesses.

Mobitel, Sri Lanka Telecom's mobile subsidiary, recorded double digit revenue growth of 11 per cent for the 2014 financial year. In absolute terms, it is said to have crossed the LKR30bn (USD22.5m) milestone to record a sales turnover of LKR30.60bn in 2014 compared to LKR27.48bn in 2013. Mobitel says its "considerable investment and timely upgrades" in broadband technologies such as 3G and 4G paid off with a notable increase in broadband revenues compared to 2013.

Fibre and WiMAX operator Wateen Telecom has been awarded a USD5m project to build a Metro Ethernet platform for Warid Telecom in Pakistan. It will procure and deploy hardware from Cisco to carry Warid's GSM/packet/LTE traffic over the metro network. Wateen will use the vendor's routers, switches and optical DWDM systems, along with integration to Warid's IP core network. The Metro Ethernet platform will encompass eight major cities and is expected to be completed by April 2015, followed by a year of support.

Grameenphone reported revenues of BDT102.7bn (USD1.3m) for 2014, up 6.3 per cent from the previous year. It acquired 4.4m new subscribers during the period, taking its total customer base to 51.5m by the end of 2014. YoY service revenues grew by 5.9 per cent, mainly driven by data and VAS. However, the operator says service revenue growth faced "some headwind" from the local reduction in international call termination rates.

Vietnam's government is reportedly planning to auction 2.3GHz and 2.6GHz licenses to enable the launch of LTE services by early 2016. According to *Thanh Nien News*, it will also support the use of 900MHz for 4G as well as 3G. Reports say the country's MNOs prefer the use of low frequencies to roll out their services in rural as well as urban areas. They also support refarming 2G spectrum for 3G, and are apparently reluctant to invest in high frequencies.

Intelsat and Azercosmos will build a new satellite that will orbit at 45°E. *Azerspace-2/Intelsat 38* is due for launch in 2017 and will cover Asia, Africa, Central and Eastern Europe. Azercosmos is the national satellite operator of Azerbaijan. It will use *Azerspace-2* for enhanced capacity and coverage to support the growing demands in the region for DTH, government and network services currently offered by *Azerspace-1*. For Intelsat, the new satellite will provide continuity of service for *IS-12* which is currently at 45°E.

INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
11/12/14	Bond markets	PT Indosat	Bonds	USD202m	Around 78% of the proceeds will help re-finance debts while 22% will pay for a 10-year mobile license.
23/12/14	Telstra	Pacnet	Pacnet	USD697m	Singapore & Hong Kong-based Pacnet offers Telstra a bigger data centre network & more submarine cables.
28/1/15	CommScope	TE Connectivity	Telecom, Enterprise & Wireless divisions	USD3bn	CommScope aims to expand into fixed/FTTx market & meet growing demand for broadband in all regions.
2/3/15	HP	Aruba Networks	Aruba Networks	USD3bn	HP wants to add wireless mobility solutions to its portfolio of wired switching products.

NEW APPOINTMENTS

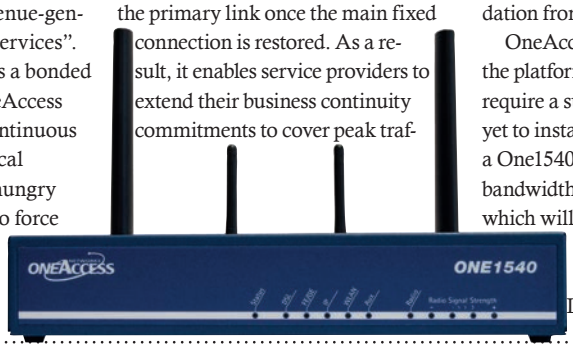
Date	Name	New employer	New position	Previous employer	Previous position
10/12/14	HyunChil Hong	Samsung Electronics	President, Southwest Asia Headquarters	Samsung Electronics	President, Latin America
5/1/14	Rahul Nehra	SCTE India, Society for Broadband Professionals	Honorary national secretary	SCTE India	Co-founder
14/1/15	Jürgen Eynck	DAMM	Director, R&D	Fjord-e-design sales	Authorised officer
19/1/15	Peter Hoene	SES Government Solutions	President & CEO	SES	Corporate VP, development
22/1/15	Rajiv Khattar	ABS	President – South Asia	Dish TV India	President of projects
23/1/15	Desmond Cheong	DAMM	Regional manager, South East Asia	Jebsen & Jessen Comms.	Director of sales
23/1/15	Sunil Sood	Vodafone India	CEO	Vodafone India	COO
29/1/15	Joe Barrett	GSA	President	VisionComs Ltd	Founder
10/2/15	Vince Edwards	Sepura	DMR proposals systems engineer	Hytera	System sales engineer
10/2/15	Steve Sarno	Wyless	CFO	Exa Corporation	EVP of finance & chief accounting officer
12/1/15	Lars-Åke Norling	dtac	CEO	DiGi Telecommunications	CEO
13/2/15	Gwenn Larsson	Flexenclosure	CMO	Deutsche Telekom	VP of global sales
2/3/15	Christophe De Hauwer	SES	Chief development officer	Arthur Andersen	Consultant
4/3/15	Paul Watson	Sepura	COO	Thales UK	VP, operations

OneAccess unveils LTE-enabled multiservice access router platform

OneAccess says its new integrated 4G router platform enables operators, cloud and managed CSPs to add LTE connectivity to the growing list of access technologies they can integrate on multipath WANs. It adds that the *One1540-4G* also provides a single, centrally managed application platform over which service providers can deliver "bundles of revenue-generating managed network services".

The new platform enables a bonded LTE link on the WAN. OneAccess says that this ensures the continuous availability of business-critical applications as bandwidth-hungry cloud-based apps continue to force increasing volumes of data across the network.

The vendor claims the *One1540-4G* can effect a seamless and automatic failover to LTE, together with an automated return to the primary link once the main fixed connection is restored. As a result, it enables service providers to extend their business continuity commitments to cover peak traffic periods when failover to legacy cellular standards, such as 3G or HSPA+, could risk performance degradation from overloading the network.



OneAccess says operators can use the platform with customers that require a superfast connection but have yet to install a fibre link. By deploying a One1540-4G they can deliver a high-bandwidth LTE link of up to 150Mbps which will automatically switch over to a fibre link when cabling is completed, retaining the LTE link as a failover.

MANUFACTURER: OneAccess

PRODUCT: One1540-4G

MORE INFORMATION:
www.oneaccess-net.com

Mini COFDM transmitter for bodyworn surveillance

MEL Secure Systems has launched a new and compact COFDM H.264 digital video transmitter to meet the needs of users in a wide range of security and military applications. Measuring 86 x 56 x 25mm, *Ranger Mini* is said to support high-quality, real-time video monitoring and recording applications for bodyworn, mobile and temporary CCTV uses.

It's claimed to provide "class-leading" performance, and uses ultra-narrowband to provide "exceptional" range and video quality in high multi-path environments regardless of line-of-sight. MEL says the unit delivers images at distances of up to 1km in non-line-of-sight urban environments, while a 15km range has also been achieved in line-of-sight environments.

The firm says the device also enables users to co-locate more channels in the increasingly crowded RF spectrum. It is available in a wide range of frequencies including 1.3GHz, 2.4GHz and 5.8GHz, while bandwidth is available in 1, 2, 4 and 8MHz. MEL adds that built-in AES 128/256-bit encryption ensures the highest security standards.

Optional receiver kits include an LCD monitor and integrated DVR which enable high-quality, interference-free images to be received from up to four cameras simultaneously.

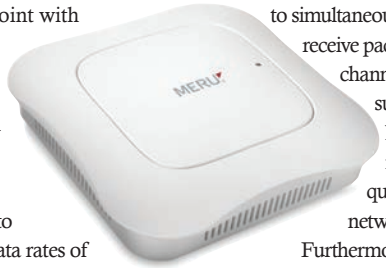
MANUFACTURER:
MEL Secure Systems

PRODUCT: Ranger Mini

MORE INFORMATION:
www.melsecuresystems.com

Intelligent access point uses cluster technology

The *XPress Cloud XP8i* is a cloud managed access point with enterprise-class capability. The 802.11ac AP can simultaneously operate at 2.4GHz and 5GHz, and is claimed to be able to deliver aggregate data rates of up to 1.2Gbps thanks to support for two spatial streams.



Each radio uses multiple antennas to simultaneously transmit and receive packets over a single channel. Meru says support for 2:2 MIMO means improved link quality, reliability and network throughput.

Furthermore, clustering technology automates WLAN provisioning with *XP8i* APs sharing configuration settings. Once a "master" AP is set-up via Meru's *XPress Cloud* GUI, it automatically pushes the configuration to all the APs in the cluster.

The firm claims there is no single point of failure in case an AP goes off-line, and if interference is discovered on one channel, the AP automatically adjusts itself to a better one.

MANUFACTURER:
Meru Networks

PRODUCT: XPress Cloud XP8i

MORE INFORMATION:
www.merunetworks.com

Elevate "slashes" time-to-market for wireless devices

Spirent Communications describes the *Elevate Test Framework* as a "revolutionary advance" in testing wireless and M2M devices and services. It claims *Elevate* provides a unique open test architecture and offers "powerful" resources to enable faster time-to-market and improved user experience.

Unlike conventional platforms, Spirent says its framework separates hardware from software, making use of virtualisation and organising test elements into an open architecture.

Elevate offers analytics that cross all phases of wireless device development, such as emulated and live services, instrumentation, an open API, and automated and interactive testing. It then outputs shareable test results for comprehensive collaboration.

"With surges in smartphones and M2M devices, legacy test solutions are not able to support the complexity and time to market needs", says Spirent.

MANUFACTURER:
Spirent Communications

PRODUCT:
Elevate Test Framework

MORE INFORMATION:
www.spirent.com/Elevate

Nokia Networks launches OSS software as a service

Nokia Networks has developed OSS as a Service in an effort to enable operators to shift capex to opex for lower and more predictable costs.

The firm is offering two OSS tools as a service: *Performance Manager* to help operators manage the performance and capacity of 2G, 3G and LTE networks; and *Service Quality Manager* which aims to give them an accurate real-time view of service quality across mobile broadband and IT networks.

Nokia reckons OSS as a Service provides "greater business agility" with deployment in just a few weeks. It says overall operator costs can be 19 per cent lower compared to conventional business models, due to reduced installation, integration and operation costs.

The tools are hosted and supported by Nokia Networks' Global Delivery Centres. Users can choose to take the tools with maintenance and basic services such as key quality indicator modelling for *Service Quality Manager* for example, or a more comprehensive package that also includes service management for a fully outsourced service operations centre.

Nokia says as operators look to take advantage of efficiencies that cloud-based networking can offer, hosting models can not only help reduce the disruption of upgrade cycles, but also schedule expenditures to better match the ramp-up in network requirements.

It adds service management can resolve service quality degradations 20 per cent faster than a NOC alone.

MANUFACTURER: Nokia Networks

PRODUCT: OSS as a Service

MORE INFORMATION: www.company.nokia.com

10GbE platform for virtualised services

Telco Systems has added *CloudMetro 100* to its *Open Metro Edge* range of solutions. According to the SDN and Carrier Ethernet specialist, the offering is the first 10GbE platform for virtualised IT services at the network edge.

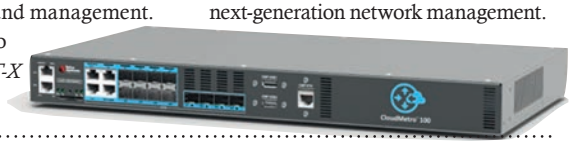
CloudMetro 100 is said to offer a carrier-grade platform that enables service providers to transform their transport networks to full IT-enabled networks. According to Telco, this makes their networks "highly orchestrated, agile and virtualised".

The platform supports distributed network functions virtualisation (NFV), enabling operators to run the vendor's virtualised apps to provide multi-services in addition to connectivity.

To implement distributed NFV, *CloudMetro 100* combines a switch and integrated Intel x86 CPU as a hosting processor. This runs the *Telco Virtualisation Engine* infrastructure layer, enabling carrier-grade virtualisation support that simplifies NFV execution and management. The platform also utilises Intel's *VT-X* technology to optimise virtualisation performance.

Telco says that accelerating demand for bandwidth is already pushing NFV toward the next modernisation wave that will satisfy bandwidth-hungry NFV applications over high-capacity Ethernet. It says the 10GbE-capable *CloudMetro 100* meets this approaching capacity challenge while supporting all of the latest transport technologies including Carrier Ethernet 2.0, IP/MPLS and OpenFlow.

In addition, it provides many O&M, resiliency and HQoS capabilities, as well as NETCONF and YANG for next-generation network management.



MANUFACTURER: Telco Systems

PRODUCT: CloudMetro 100

MORE INFORMATION: www.telco.com

An all-in-one solution to critical threats

Adax has launched a new all-in-one solution to help operators protect subscribers and their data.

The packet-processing and network infrastructure specialist says its *SEG+* is a security gateway that will enable operators to have greater control of their networks. Adax says it will help them deal with a general culture of security threats which has opened up a whole new portal for intruders to infiltrate data packets on the core network.

It's claimed the gateway delivers performance, reliability and scalability, securing the connection between untrusted networks and the core in a complete carrier grade solution.

SEG+ has been designed to offer high-quality, robust security performance through hardware acceleration at low cost for high bandwidth and scalability.

Adax says the gateway uses the most current IPsec security features including MOBIKE, IKEv2 and TCP/IP firewall, and also offers support for IPv6/IPv4 and 64-bit platforms.

An onboard switch provides up to 16 x 1G or 4 x 10G interfaces to the network, and dual 10G or dual 40G connectivity to the core without the need for extra blades or modules.

MANUFACTURER: Adax

PRODUCT: SEG+

MORE INFORMATION: www.adax.com

ALSO LOOK OUT FOR

Keysight offers signal library for 5G research

Keysight Technologies says its EEsof EDA 5G Baseband Exploration Library provides ready-to-use reference signal processing intellectual property for 5G technology research.

The Agilent subsidiary claims the opening of its library is an industry first, and that it will "dramatically" increase the productivity for system architects and baseband physical layer designers.

Launched last November, the library supports various 5G candidate waveforms for orthogonal and non-orthogonal multi-carrier comms systems, including advanced MIMO and beamforming signal processing.

It also provides transmitter and reference receiver modelling examples which, according to Keysight, can be easily re-designed to achieve optimal performance for comparison of each of the candidate standards proposals.

The new resource consists of source code, subsystems, models and infrastructure components. These can be used for the high quality, rapid development and verification of advanced digital modems using Keysight's *SystemVue* simulation platform.

The company says the source code provides a self-documenting independent reference library that allows system designers to quickly replace and modify blocks, and subsystems to meet the needs of their specific end product.

It claims *SystemVue's* integrated simulation environment allows users to investigate, implement and verify their communications PHY signal processing designs with dynamic link-level scenarios.

Adding the new library to the platform provides a number of features. Keysight says these include: advanced DSP blocks for 5G candidate waveform technologies; end-to-end PHY layer transmit and receive simulation models; signalling schemes for MIMO channels including spatial multiplexing, space-time coding and multiple detection methods; and more.

Satcoms taking off over Asia

Inmarsat launched *I-5 F2* in February. It is the second of the firm's fifth generation satellites which promise to deliver broadband speeds that are 100 times faster than their predecessors.

The major operators are planning to launch state-of-the-art satellites over the next couple of years and they're all destined for Asia, as ABDUL MONTAQIM discovers.

Asia's large user base, topographic challenges, and major markets that include India and Indonesia, are key elements favouring satellite usage compared to other regions, according to a study carried out by Northern Sky Research (NSR) last year.

It believes the region will dominate the satellite backhaul market with 27 per cent of global revenue, and that it will be a key battleground for a host of solutions including FSS and HTS (high throughput satellites). While Asia's need for inexpensive capacity supports HTS, rain attenuation issues give traditional FSS C-band capacity the edge, said NSR. "South East Asia or Indonesia will likely continue to prefer C-band for wireless backhaul, while Australia through NBN clearly favours HTS for broadband access services," said study author Jose Del Rosario.

But he goes on to point out that the ultimate winner will be the frequency, platform or solution that can best address the region's growing base of smart device users and the explosive demand for data and video. Clearly, both local and global satellite operators believe HTS offers the way forward here.

For example, Asia Broadcast Satellite (ABS) is planning two new satellites for this year. *ABS-3A* went up in early March and will provide coverage across Africa, the Middle East and the Americas. *ABS-2A* is due for launch in late 2015 and will be co-located with *ABS-2* at 75°E to serve South East Asia, sub-Sahara Africa, the Gulf Cooperation Council region, Afghanistan, India and Russia.

Designed with 48 transponders and five dedicated high-powered Ku-band beams, ABS says the satellite will offer DTH, VSAT, maritime and mobility services. Like *ABS-3A*, it will be among the first commercial satellites in orbit to use an electric propulsion system (EPS) from Boeing. This aims to gives operators more affordable launch options as well as the ability to nearly double payload capacity.

Birds with multiple missions

Eutelsat will also use an EPS as it steps up its expansion in Asia-Pacific with a new high-capacity triple mission satellite. *EUTELSAT 172B* will go into orbit in 2017 to provide continuity and capacity from 172°E, a location the operator describes as "a prime gateway" for services in the region.

Weighing 3.5 tonnes, *EUTELSAT 172B* will be the first European satellite to use electric propulsion for initial in-orbit raising and all station-keeping manoeuvres. It is being manufactured by Airbus Defence and Space (ADS) which says the reduction in mass will enable the powerful 13kW satellite to be launched using the *Ariane 5* vehicle's lower position, resulting in lower launch costs. In-orbit raising is expected to take approximately four months.

The new satellite will host three missions. A C-band payload will enhance services currently provided via *EUTELSAT 172A* and tap into new growth markets in South East Asia. A regular

Ku-band payload will also enable Eutelsat to double capacity at 172°E and connect to five improved service areas: North Pacific; North East Asia; South East Pacific; South West Pacific; and South Pacific.

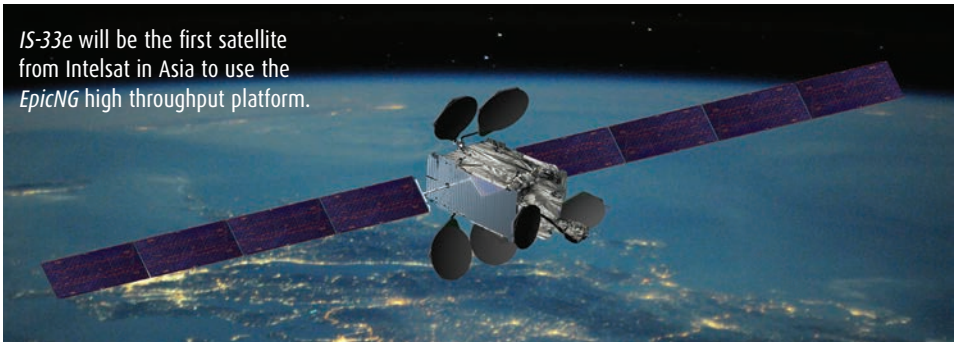
The third mission comprises a high throughput Ku-band payload specifically designed for in-flight broadband. It will feature multiple spot beams optimised to serve densely-used Asian and trans-Pacific flight paths, and interconnected to gateways operating in Ka-band. The firm claims this new payload will be the first customised for in-flight connectivity over the Pacific Ocean region, delivering an overall throughput of 1.8Gbps to an underserved market.

In-flight entertainment and communications provider Panasonic Avionics Corporation has already signed a long-term deal to become the anchor client for *EUTELSAT 172B*'s high throughput payload for broadband services, as well as a user of regular Ku-band capacity for live TV.

EUTELSAT 172B will also be the first from the company to dynamically distribute power between its 11 high throughput beams. Eutelsat says this will enable it to respond to traffic variations across the payload's footprint which spans eight time zones from South East Asia to the west coast of North America.

SES' plans for Asia include the launch of *SES-9* in the coming months. It will orbit at 108.2°E to expand the company's capabilities to provide DTH and other services such as maritime communications. The satellite will cover North East Asia, South Asia and Indonesia.

But *SES-12* looks set to be one of the company's more exciting satellites to look out for. Billed as a hybrid HTS for Asia, it is currently being built by ADS and is planned for launch in late 2017. Like the forthcoming orbiters from ABS and Eutelsat, it too will have an EPS for orbit raising and on-orbit manoeuvres.



IS-33e will be the first satellite from Intelsat in Asia to use the *EpicNG* high throughput platform.

SES-12 will replace SES' existing *NSS-6* and be colocated with *SES-8* at 95° E when it's launched during Q4 2017. The new satellite will expand the operator's capabilities to provide DTH broadcasting, VSAT, mobility, and data connectivity services in the region, including rapidly growing markets such as India and Indonesia. It will be positioned at 95°E from where SES claims it currently serves close to 20 million DTH households in India and Indochina.

Designed to operate for 15 years, *SES-12* will carry a payload that includes 68 Ku- and eight Ka-band transponders. It will offer what SES describes as "two distinct but complementary" missions. Firstly, there are 54 (36MHz equivalent) transponders for traditional wide beam coverage. The firm says these will provide "state-of-the-art" replacement and growth capacity for its existing DTH, government and VSAT customers, enabling a "seamless" transition from *NSS-6* to *SES-12*.

The second mission consists of 70 Ku- and 11 Ka-band spot beams. It's claimed these high throughput beams will deliver more than 14GHz for VSAT, enterprise, mobility and government applications. This mission also includes a Digital Transparent Processor which, according to SES, provides anti-jamming capabilities as well as increased payload flexibility in order to provide bespoke bandwidth solutions to customers.

PHOTO: BOEING

ABS-3A was jointly launched with *EUTELSAT 115 West B* in early March. They are the world's first satellites in space to use electric propulsion systems which has a number of benefits such as giving operators greater launch options. Here, the two satellites are shown stacked together as vertical pair on a Boeing *702SP* platform.

Superfast services on the way

Intelsat currently has around eight satellites offering C-band and Ku-band services to South Asia and the surrounding regions. While it plans to launch four new satellites in 2015, these are mainly aimed at the Americas. Its next spacecraft for Asia are currently under construction at Boeing and are both due for launch in the second half of next year.

Intelsat 33e will orbit at 60°E and offer global coverage via C- and Ku-band beams, as well as Ku-band multi-spot and transatlantic beams.

Intelsat 36 will be positioned at 68.5°E and is equipped with Ku- and C-band transponders. African pay TV broadcaster MultiChoice has already purchased *Intelsat 36*'s entire Ku-band payload for Africa to provide DTH services on that continent, while the C-band payload will be used by Intelsat to offer services to other customers using the 68.5°E neighbourhood.

Intelsat 33e and *Intelsat 36* will be Intelsat's first satellites for Asia to use its much talked about *EpicNG* high-performance platform. Designed as a complementary overlay to its fixed satellite network, Intelsat says *EpicNG* uses C-, Ku- and Ka-bands, wide and spot beams, as well as frequency re-use technology to provide a variety of customer benefits. The platform will be fully integrated with the company's existing fleet and global *IntelsatOne* terrestrial network.

According to the firm, *EpicNG* is based on open architecture and engineered for backwards compatibility. It says this allows broadband, media, mobility and government organisations to realise the cost-efficiency of using existing hardware. It also gives increased control, enabling service providers to offer their end-users customised and differentiated solutions – even defining such service characteristics as speed, hardware and network topology.

Intelsat goes on to claim that the platform will provide three to five times more capacity per satellite than its traditional fleet. It adds that throughput will vary according to application and satellite, but is expected to be in the range of 25-60Gbps which is typically 10 times more than its traditional fleet.

Meanwhile, Inmarsat is investing USD1.6bn in *Global Xpress* (*GX*) which it claims will create the first superfast mobile broadband service available worldwide delivered through a single network operator. Its first *GX* satellite, *Inmarsat-5 F1*, was launched in December 2013 and entered commercial service in July 2014 covering Asia and MEA. *I-5 F2* went up on 1 February 2015 to provide superfast broadband services for the Americas and the Atlantic Ocean. It is currently going through its electrical orbit-raising phase and will be positioned at 55°W. Following the launch of *I-5 F3*, which is scheduled for early Q2 2015, Inmarsat is planning to start commercial *GX* services worldwide during the second half of the year. The UK-based firm says it will deliver broadband speeds that are more than 100 times faster than its fourth generation (*I-4*) fleet.

All three satellites in the initial *I-5* series feature a Ka-band payload while integrating with the company's L-band network. Each one has 89 beams and six steerable high-power spot beams for multi-regional coverage. They operate with a combination of fixed narrow spot beams which Inmarsat says enable them to deliver higher speeds using more compact terminals, plus steerable beams so additional capacity can be directed in real-time to where it's needed.

Inmarsat CEO Rupert Pearce said: "Through *Global Xpress*, the world can move forward from the 'Internet of Everything' to the 'Internet of Everywhere' in which high-speed, reliable and secure connectivity is available anywhere and at any time – even in the most inaccessible regions – for customers on the move or to fixed locations."

Of the other 'big name' global operators, O3b Networks ended 2014 on a high note with news of the successful launch of four more of its satellites. They were sent into medium Earth orbit (around 8,000km) on 18 December, and mean that the company's initially planned constellation of 12 satellites is now complete. The new spacecraft are currently going through a period of in-orbit testing and are expected to be integrated into the O3b network in early 2015.

O3b's fleet has been fully operational following the launch of its second quartet of satellites last July. It says this added more than 80Gbps of capacity to its network and expanded fleet capacity to over 100Gbps. CEO Steve Collar has previously indicated that in the future O3b intends to increase its in orbit capacity to more than 1Tbps.

Regional players

The Indian Space Research Organisation (ISRO) claims it is one of the world's largest satellite system operators. Since being established in 1969, the Indian government's space agency says it has produced and launched more than 50 spacecraft, including 30 for communications.

Its constellation includes: the Indian National Satellite System (INSAT) which is used for telecoms, broadcasting, meteorology and search and rescue operations; the Indian Remote Sensing (IRS) satellites used for Earth observation; and the GSAT satellites that are used for communications.

ISRO recently launched *GSAT-16* with the aim of further augmenting communication services across India and beyond. Equipped with 36 C- and 12 Ku-band transponders, it has the largest total number of transponders on a communications satellite developed by ISRO.

It orbits at 55°E and is co-located with three other spacecraft which include *GSAT-8* as well as *IRNSS-1A* and *IRNSS-1B*. The latter two are operated by Indian Regional Navigation Satellite which has placed them in geosynchronous orbit as they are intended as a GPS alternative for India and its surrounding regions.

Singapore Telecommunications (better known as Singtel) is aiming to become one of the region's flagship telcos with some of its state-of-the-art network deployments (*see News, p5*). The company is estimated to be in the top 30 of the largest mobile network operators in the world, and has a subscriber base of 500 million customers in 25 countries such as Australia, Bangladesh India, Indonesia, the Philippines, Singapore, Sri Lanka, and others.

Singtel has a satellite division that is responsible for its own spacecraft and ground stations, and it also sells services to other operators. For example, it is currently undertaking a project to backhaul more than 120 sites for an unnamed cellco in Malaysia.

"We have our *ST-2*, *ST-3* and *Apstar-5* satellites which provide coverage over Southeast Asia, Oceania, Middle East and Africa, and India," says Singtel Satellite head, Lim Kian Soon. "These are mostly Ku-band and C-band capacity. We are seeing a lot of requirements in terms of internet trunking, maritime, DTH, as well as mobile backhaul and content distribution."

Soon adds that Singtel's established infrastructure enables the company to offer products such as *MVSAT*. "[This] provides higher bandwidth, reliable and secure ship-to-shore communications for better monitoring and tracking of vessel operations for customers such as Pacific Richfield Marine," he says.

Like ABS and Singtel Satellite, Thaicom and MEASAT are among a growing number of Asian-based operators branching out into Africa.

Thaicom, whose satellites are officially named by Thailand's reigning monarch, King Bhumibol Adulyadej, says demand for Ku-band capacity is rising in its home country as well as throughout South Asia and Africa. As a result, it is investing USD180m on the build and launch of its next spacecraft to add to the it already has which serve South Asia. *Thaicom 8* is currently being built by Orbital Sciences Corporation and will orbit at 78.5°E when it's launched by SpaceX in 2016.

Established in 1993 by Malaysia's then prime minister Dr Mahathir Mohamad, MEASAT has six satellites currently in orbit. *MEASAT-3*, *3a*, *3b* and *3c* are all positioned at 91.5°E, while *MEASAT-5* is at 119.5°E. *AFRICASAT-1a* was launched in February 2013 and orbits at 46°E from where it offers C-band capacity across Africa with connectivity to South East Asia, the Middle East and Europe. *MEASAT-2* orbits at 148°E and will be joined by *MEASAT 2a* when it is launched in December 2016 to cover India, China, as well as Australasia.

MEASAT-3b is presently the newest member of the fleet and was launched last September following a delay of almost 14 weeks. It had originally been scheduled for launch on 6 June 2014 but was postponed to allow time for some repairs to *Optus 10* which was its co-passenger on board Arianespace flight *VA218*.

MEASAT-3b and *Optus10* on the launchpad in French Guyana last September. MEASAT claims its satellite is Malaysia's "most powerful" to date.

PHOTO: © 2014 ESA-CNES-ARIANESPACE/PHOTO OPTIQUE VIDÉO CSG

Arianespace's market share in APAC is now more than 60 per cent, according to the firm's chairman and CEO Stéphane Israël.

Asian domination

MEASAT-3b is said to be Malaysia's largest and most advanced satellite to date. By being colocated with *3* and *3a*, MEASAT claims it has created the region's "most powerful and robust" orbital position. The satellite itself is equipped with one S-, four X- and 48 Ku-band transponders, and will provide telecoms, video and data services to customers in Malaysia, India, Indonesia and Australia.

Speaking at the time of the launch, MEASAT CEO Paul Brown-Kenyon said: "Once operational, *MEASAT-3b* will be a key contributor to the Asian pay TV landscape, supporting DTH television platforms serving more than 18 million households."

3b started commercial services towards the end of last year. Pilipinas Global Network (PGN) had pre-signed up for capacity and is now using its global beam to distribute the Aksyon TV International and Kapatid TV5 channels to more than 120 countries across Asia Pacific, Australia, the Middle East and Eastern Africa. PGN is a joint venture between the Philippine Long Distance Telephone Company and the ABC Development Corporation, the operator of the TV5 terrestrial channel in the Philippines.

Built by ADS using a *Eurostar E3000 L* platform, *3b* weighed 5,897kg at launch and is the third spacecraft to be orbited for MEASAT by Arianespace. It is the result of more than three years cooperation between all three companies.

With the successful launch of *MEASAT-3b* and *Optus 10*, Arianespace claims it now dominates Asia-Pacific as the region's number one satellite launcher. Last September, Arianespace chairman and CEO Stéphane Israël said: "The Asia-Pacific region [is] where we have always been very successful as shown by our market share which now exceeds 60 per cent. This launch also marks the 100th consecutive successful launch of a geostationary satellite in less than 12 years."

Since being founded in 1980, Arianespace said it has launched two-thirds of the commercial geostationary satellites for APAC. It said this represents 80 contracts already signed, including ten more satellites to be launched for Australia, India, Indonesia, Japan and South Korea. ■

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Towercos are building more new sites with co-location in mind. The growth in tenants and upgrading of equipment means increased demands for site access and greater operational complexities.

The key to a secure cell site

As networks grow to keep up with demand, so do the challenges faced by the infrastructure industry. MICHAEL SOTHAN examines the issues of security and productivity in cell site operations and management, especially from the perspective of access control.

While the number of people enjoying smartphones and mobile data continues to grow, very few of them understand the infrastructure behind it. Even fewer understand the complex network of human labour that keeps this data powering labyrinth of transmission equipment running.

As voice and data services are the core of any carrier's business, their capital investments are focused on these services, part of which is active infrastructure, but possibly even more of which is in soft services such as marketing, app development and media partnerships. Meanwhile, passive infrastructure holds little appeal for MNOs and, as such, is getting further outsourced to managed service providers and their array of contractors.

As operators are moving away from owning towers to leasing space on them, more new towers are built with co-location in mind. For example, Sri Lanka is currently in a tower building phase, almost all designed for multi-tenancy. This rapid development in the telecoms space leads to new challenges, two critical ones being site security and operational efficiency. The growth in tenants and upgrading of equipment means increased demands for site access and greater operational complexities.

Operators look at tower companies who in turn seek out specialised managed service providers that are really general contractors who sub out most of their workload. As the network of labour grows larger and the network of towers stretches further – including into increasingly poor, remote, or hazardous regions – the challenges of site operations and management (O&M) further increases.

Moreover, the pressure placed on the operators by government regulators for greater QoS continues to increase. This pressure is then passed down through the chain back to the sub-contractors. Strict SLAs are made to ensure uptime is optimal. In India, for example, requirements range from 97 to 99 per cent.

Most security breaches are an 'inside job'

One of the basic guarantees offered by a towerco is protecting its tenants' assets. While social issues over land disputes, fear of radiation, noise complaints and the like can lead to public discontent, and criminals may find diesel, copper and batteries enticing enough to vandalise a site, what is ironic is that the majority of security

problems arise internally. Through its interactions with towercos around the world, Acsys has gathered enough data (usually from investigations conducted by towercos on their own operations) to deduce that 95 per cent of theft is due to 'inside jobs.'

Towercos have to keep sites up and running and protect their tenants (and thus themselves) from facing massive fines, while at the same time reducing their own opex. But in order to do all this effectively, they have to find a way to better control and monitor the very people trusted to carry out these tasks in the first place.

To solve a problem, you must find its root. This goes beyond merely fighting the symptoms. Most service companies are staffed by hardworking, honest people. But they may be working hard and honest to follow an imperfect process. Sometimes the root causes of inefficiencies in workforce management stem from the simplest of places.

One major cause is the lock and key systems deployed on many sites. As the architect of 'Big Data', it makes sense that the telecoms industry is demanding more of it to monitor its own infrastructure. As towercos see the ROI potential, a drive for deploying RMS equipment on sites is underway. And yet, even after investing in these devices, determining who is coming in and out of the site, for how long, and why, is left to a hazy world of hearsay and paper trails.

It seems bizarre that one of the most hi-tech industries relies on security systems similar to those in place a thousand years ago. The use of mechanical keys opens the door to all kinds of problems, and the most critical issue is often the most overlooked – wasted time.

Often, when a trouble ticket is generated, a contractor drives to the office only to find that the necessary key is already out in the field. He or she then has to find it, go to the site to remediate the problem, and then drive back to the office to return the key. Now imagine the same situation in the middle of rush hour traffic in Mumbai! Furthermore, if the contractor is undertaking emergency maintenance, all this administrative time directly translates to downtime.

Then there are the security risks. One of these is the simplicity of picking mechanical locks – a quick online search can give an aspiring thief the perfect guide. Next there is the issue of copied keys. With SLA adherence bearing down on the shoulders of service providers, many do not want to waste critical time driving to a central office, applying for a key, then driving back to return it. So they simply make a copy of it. And that leads to an unknown amount of copied keys floating around which sometimes remain in the hands of dismissed, and potentially disgruntled, employees.

Many towercos and carriers thought they could reduce the wasted resources in managing mechanical keys by switching to combination locks. But this only exacerbates the security problem. How many people know that combination? One wrongly sent email, open notebook, or worst of all, a leak onto the internet, and then what? Now site visits are required to update every lock in the network with that combination – we have found that most companies will only use one code for all locks in a region or even an entire country.

Lastly, there is the problem of accountability. Mechanical systems leave no record so when something goes missing or is damaged, who is to blame? With co-located sites the problem is multiplied. So without a clear record on site it is all just a guessing game – and when dealing with multi-billion dollar accounts, who can afford that?

Mechatronics – the way forward

Cell site managers could deploy a wired access control solution such as a card system similar to that found in offices. But the challenges of connecting cables and control panels to outdoor gates in environments ranging from jungles to deserts, enduring rain to snow (and potentially a violent swing of a hammer), leaves wired solutions out of the equation. Moreover, the complicated and timely process of installation makes the option too much of a financial burden for infrastructure providers to justify.

A battery powered lock is not a good option due to the same lack of durability. Moreover, no one wants to show up at a site to find that the lock's battery has died and the only way in is to completely break the door or cut the fence. Now you need a new lock and a new fence.

Operators need a solution that is easy to deploy, can be readily fitted to a wide variety of assets, and even quickly removed and relocated if need be. And at the same time, it needs to remain secure and robust, and offer the same kind of intelligence as that of a software-based card system. All that represents a considerable challenge.

It seemed this void could not be filled until the emergence of new 'mechatronic' (mechanical and electronic) lock technology. The mechatronic access control industry is still young and currently dominated by a few major players, and while early forms of the technology have been around since the turn of the century, the telecoms industry only began adopting it around five years ago.

Mechatronic locks allow the intelligence embedded in a microchip to be conveniently fitted in standard lock bodies. Because these locks have the same form factor as those already utilised in cell sites, the switch requires no change to site design as well as minimal installation costs and time.

Keys can be programmed to open any number of locks at specific times, providing security and convenience similar to card systems. Because the opening force is still applied by the physical turning of a key, there are no faulty motors, belts, or parts to maintain to reduce the stability of the system. Simply upgrading the security and intelligence of what is already there offers a neat solution, and the industry has begun to show its agreement through rapid adoption.

While mechatronic locks have grown in popularity, they are often close to 10 times the costs of regular lock. And until recently, they did have a few key weaknesses which made it hard to justify such investment.

For instance, if a key is programmed to open a large number of locks, for say three months, what happens if the key is lost early in that timeframe? This requires the towerco to send someone to every site to electronically update the lock and blacklist the lost key.

Another issue is that while a record of the access is stored in both the lock and key, there is a vacuum of information until the key is returned to download its logs. Since keys are pre-programmed and not online, how can they be controlled in real-time while simultaneously being made available for use?

Acsys' answer to these problems was to first add a keypad to the key, thus removing the fear of a lost device falling into the wrong hands. An *Acsys Keypad Key* cannot be activated until the users PIN is entered. Three wrong entries and the key is blocked, just like a credit card.

So what if the person who is fraudulently using the key is its owner? And what about real-time control? This prompted the creation of our patented *Code Generation System (CGS).* Functioning on the same principle as token generating systems in online banking, *CGS* requires the user to request an opening code. This code is randomly generated by software in real-time, transmitted to the user and input into a special keypad key, activating the key for a limited period of time. When the technician needs to lock up the site, he or she requests a closing code and repeats the same process.

The code given is completely site and asset specific. It automatically segments the access granted between sites and tickets, and even to different types of engineers. For example, a genset technician will not gain access to open the LTE cabinet, and the LTE tech will not gain access to the fuel or batteries in the genset.

Last, but definitely not least, is that the NOC is notified of what is happening in terms of maintenance for every site in its network, all in real-time. This is due to the required code request which can be achieved through a phone call, SMS, or an app. Moreover, the system can be seamlessly integrated into a telco's current ticketing platform to paint a complete picture of the state of its O&M.

Many sites are becoming more modular in design (sometimes called 'lite' anchor sites) which allows for easy upgrading of equipment. One

An *Acsys Keypad Key* cannot be activated until the user's PIN is entered. Three wrong entries and the key is blocked, just like a credit card.

To keep sites up and running effectively, towercos have to find a way to better control and monitor the very people trusted to carry out such tasks in the first place.

of the beauties of the Acsys system is that it is designed with a similar modular concept. If users suddenly change and new keys are added, zero modifications are required for the locks on site. For instance, if the cabinet is changed to add 4G equipment, just move the mechatronic padlock to the new cabinet. Any system that is not flexible becomes a great financial risk for the end user.

The power of data in action

Ultimately, all this is really about the data. The use of both an open and close code provides a good picture of the MTTR for any kind of maintenance. When compared between regions or between different contractors, operators and towercos can quickly determine where their trouble zones are, penalise bad contractors, and reward good ones. This data can be used to set KPIs which in turn help frame SLAs that are fairer for the owner, tenant, and service professionals. If a problem does arise, there is a clear trail of data generated per ticket to audit the situation.

For example, during a site survey Acsys carried out for an operator in South America last year, we couldn't get the key for access because the technicians who had it could not be found. In the end we found them – at the police station. When they accessed the site for routine maintenance it set-off a door alarm. NOC personnel saw this but did not know why someone was there or who it was. The alarm was automatically sent to the local police whose monitoring system is integrated with the NOC. They apprehended the technicians for four hours, delaying all site maintenance work. Thus, a discrepancy in communication between the service provider and the NOC lead to an embarrassing and costly situation all because a poor process was in place.

Another example is of a major tower company which trialled Acsys' mechatronic solutions to see if the additional data generated could improve its operations. The firm deployed our solution in a cluster of sites to assess a particular type of maintenance – oil filter replacements on the same model of gensets. By tracking the access data across three different contractors, the towerco discovered something very interesting.

MTTR was measured by monitoring the in and out times of the contractors based on the code requests for their mechatronic keys. This revealed that Contractor 1 finished the job in an average of just under one hour, Contractor 2 finished between 10 to 15 minutes, and Contractor 3 usually took around two hours.

The towerco then audited each site's genset. The one serviced by Contractor 1 all had new oil filters correctly installed. But while Contractor 2 seemed to be able to do the same thing in under 15 minutes, it turned out that they didn't replace any of the oil filters. Meanwhile, Contractor 3's sites all had new oil filters but it took over twice the time which implies that they were billing the client for long breaks and idle time.

The towerco was able to exploit this data to set a KPI of one hour for all future oil filter changes which it put into the SLAs signed by contractors. This simple piece of data resulted in a saving for the company of USD80,000 in one year.

Lock into the right process

We often hear criticism that if the locks are impossible to pick and cut then thieves will just cut the fence. If someone really wants to get in they will find a way. But the job of security professionals and the investment in security solutions should be seen from the viewpoint of prevention and deterrence. The more you spend on both, the better. Barbed wire, fortified walls, personal trackers, alarms, lighting, or even CCTV, are all useful in some way. I've even heard of clients in Indonesia using chickens!

It is important for industry professionals to keep a balanced approach to security investment. Many expensive solutions do very little to prevent theft. For example, CCTV is a passive solution and while it can deter through fear of discovery, it does nothing to stop the determined thief (moreover, a hood or baseball hat is usually all that is necessary to foil the cameras).

The combination of different solutions is more powerful than anything on its own. Using RMS devices to monitor fuel levels, putting a GPS tracker on a battery in the BBU, and using mechatronic locks to control access create a very powerful synergistic effect to prevent against fuel and battery theft.

In the end, what is important is putting a process in place. Once the right process is determined, a system needs to be deployed which reinforces, or even forces, this process to be followed. The beauty of a mechatronic security solution, especially one designed for the telecoms industry, is that it is not just a security solution. It is workforce management; as much an operational solution as physical security. It is data disguised as locks and keys.

Adopting the right sales mindset

It is important to differentiate opex from capex when approaching the end user for a product or service in the wireless infrastructure industry. Towercos are really financial institutions. They acquire investment, determine where to allocate it, then invest in infrastructure or valued added technology, and bank on its ability to generate returns in the long term through operational enhancements passed on to their tenants. Thus, security solutions should be marketed to tower firms with a capex mindset.

Operators want to keep as much of their capex budget as possible dedicated to the data services that generate revenue. Allocating investment in passive infrastructure and its management to their opex budget is therefore a major advantage. If done correctly, it becomes a monthly recurring fee in their balance sheet which can be used for tax benefits.

So security providers should think 'capex' for towercos and 'opex' for operators. This requires a financial strength and flexibility that not all vendors can offer. Those who fail to innovate in their sales model will find themselves struggling to stay competitive in a shifting market.

In certain parts of Asia, as installed capacity increases we are actually seeing ARPU falling. This puts greater pressure on the operator to reduce operating costs to maintain net income. It means that the demands for operational efficiency only increase on the towerco. A small increase in cost like an extra gallon of petrol used in driving time per service visit is erroneously thought to be an unavoidable cost. It is easy to overlook this expense as it is an indirect cost of only a few dollars. But when multiplied over thousands of sites, repeating 50 times a year, it becomes a serious problem. Every minute and every dollar counts. ■

Michael Sothan,
Business development director,
Acsys Technologies

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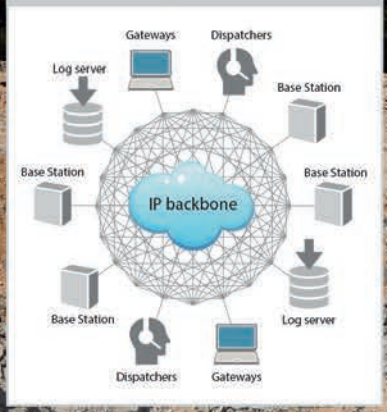

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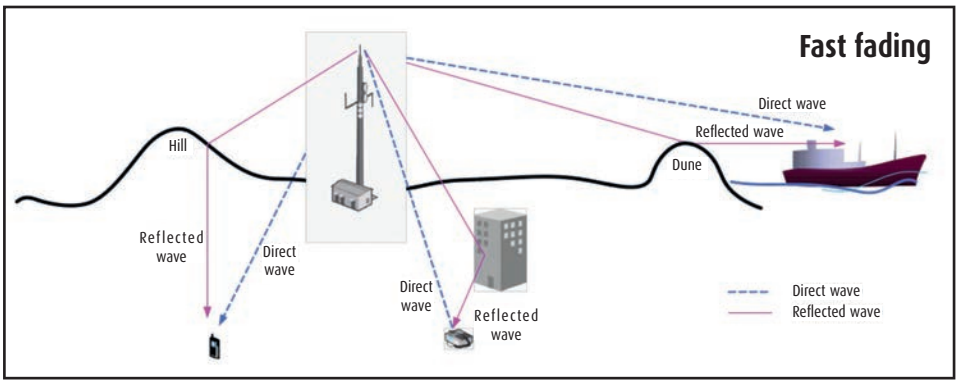
Improving recovered signal quality in TETRA

Various factors affect the transmission of digital signals, causing noise, distortion and degradation. IAN MACPHERSON describes the techniques to help address these issues.

To ensure the reliable recovery of transmitted digital signals, modern communication systems must overcome a number of factors affecting the signal's propagation through space, causing the signal to noise ratio (SNR) to degrade and, consequently, compromising the radio's ability to decode a voice or a data message.

A number of techniques exist that help overcome these distortions. The first approach advocates use of a triple diversity receiver design, while the second argues for dual diversity in tandem with equalisation techniques.



Factors affecting signal propagation and quality

Fading is a big issue here and manifests itself in several ways.

Slow fading is the attenuation of the radio signal due to propagation loss and shadowing, where the changes in signal strength are relatively slow. Slow fading or long-term fading is caused by amplitude variations due to diffraction or shadowing. When the receiving antenna moves into the shadow of a large object, or moves under the horizon of the transmitting antenna, the radio signal will fluctuate and fade away relatively slowly.

In real life, slow fading is caused by hills, buildings, tunnels, trees and other large objects that attenuate or block the radio signal. It can be reduced by careful positioning of sites to minimise shadowing effects, and power control according to TETRA standard 300 392-2.

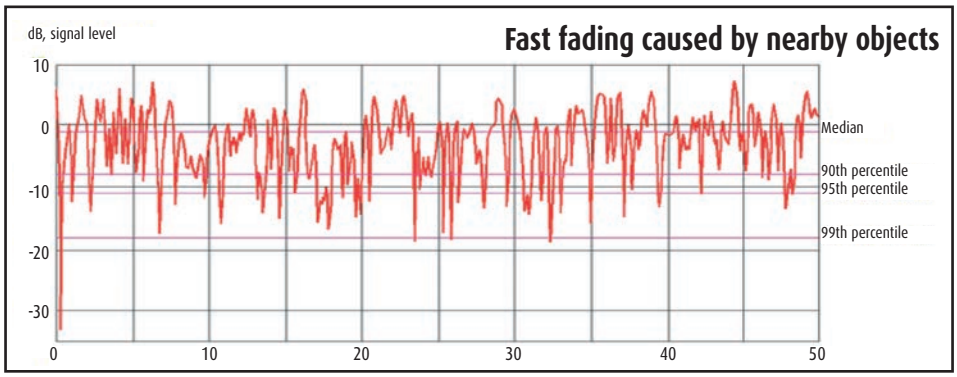
Fast fading – also known as short-term fading, Rayleigh fading or delay spread – is the attenuation caused by multi-path propagation of the signal. The receiver hears the wave on the direct path, plus one or more reflected waves. When superimposed, signals with the same amplitude and opposite phase shifts will destructively interfere with each other. This creates characteristic fading dips within a distance of fractional wavelengths (e.g. ~10cm).

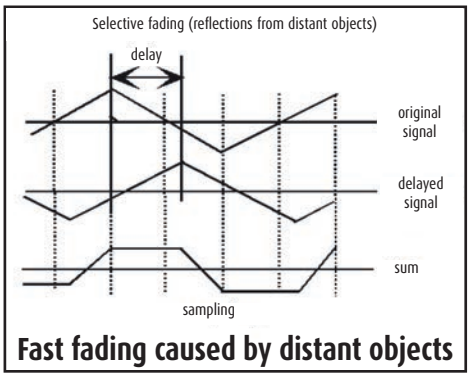
Fast fading is applicable to obstructed propagation paths (non-line-of-sight conditions) and can be mathematically described by the Rayleigh distribution. Multi-path propagation from nearby objects behaves differently to multi-path propagation from distant objects as shown above:

In urban areas, nearby objects will have a more severe and destructive impact due to the superposition of partial waves. Nearby objects can result in flat fading, when the reflected wave is 180° out of phase with the direct wave, and of equal strength. The result will be an electrical cancellation of the two signals at the receiving aerial. Fading dips caused by nearby objects will typically occur at $\lambda/4$ and the fading dips can be very deep.

With distant objects, the reflected wave may travel many wavelengths more than the direct wave, and thus the cycles of the modulating signal are out of phase. This is known as selective fading or InterSymbolInterference (ISI). Rocks and large waterfronts, such as lakes or sea are known to create ISI.

The Rician fading model describes the effect of a direct wave and a reflected wave. The ratio of the direct to indirect signal energy is known as





the 'Rice factor'. This fading type is applicable to partially obstructed propagation paths.

Compensating for fading

A number of techniques can compensate for some of the SNR losses in high-fade environments, helping to restore the quality of the recovered signal.

Firstly, there are diversity techniques. These are based on the fact that receiving multiple, uncorrelated samples of the same signal at the same or delayed time, can reduce fast-fading dips, co-channel interference and avoid error bursts.

When two received signals are combined, the achieved signal quality is better than either of the partial signals alone. Diversity will improve the performance of the TETRA radio system in environments where significant RF signal reflections are expected or when there is no clear line of sight between a transmitter and the receiver.

The following diversity schemes can be applied to the base station:

Space diversity (also known as antenna diversity) utilises two or more antennas to reduce fast-fading effects. To reiterate, fast fading is caused by multi-path propagation and mostly by the reflections of the radio waves. A radio receiver hears the wave on the direct path plus one or more reflected waves which can differ in phase, amplitude and polarisation. The intercepted radio signals therefore interfere and fluctuate very fast in amplitude.

To overcome loss of signal where a reflected wave is in anti-phase with a direct wave and to improve the quality and reliability of the radio link, antenna diversity can be applied with the TETRA base station. Space diversity performs very well with TETRA radio sites in all environments.

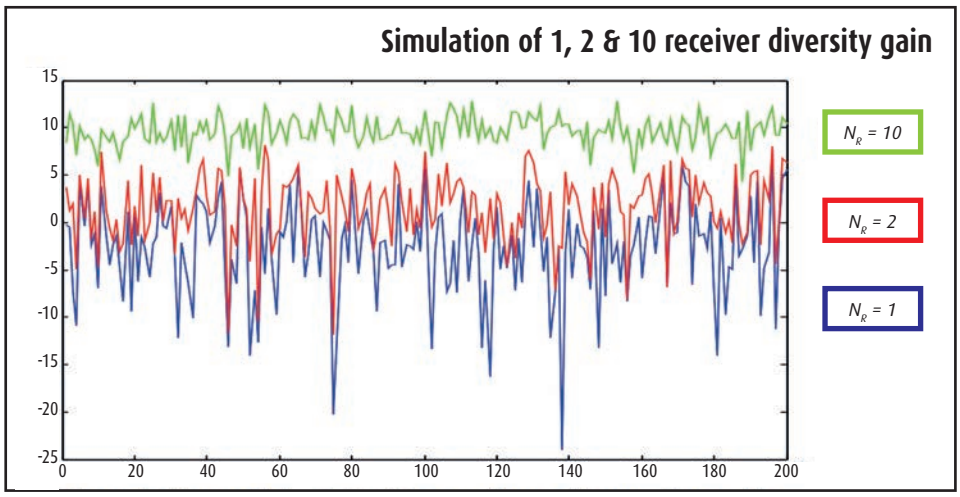
Horizontal space diversity requires two or more vertically polarised RX antennas to be separated horizontally by a certain distance. The gains derived depend upon the fading conditions and the final configuration, such as the height of the antennas above surrounding terrain and the actual spacing between them. The drawback of space diversity is that it requires a wide space separation with an additional cost for RF equipment and mechanical antenna support structures.

Polarisation diversity can be applied by using cross-polarised antennas. Signals can be received using, for example, horizontal and vertical or ±45° slanted polarisation in cross-polarised antennas.

The advantage of polarisation diversity is that it does not require a wide space separation and, with the TETRA base station, can be achieved with one antenna. In urban environments where multi-path propagation involves reflections on vertical surfaces (with high buildings and narrow streets), polarisation diversity can immunise polarisation mismatches that would otherwise cause signal fade.

Receive antenna diversity typically yields between 2-4dB of gain. This is significant but assumes that the received signals are significantly uncorrelated and both signals are close in amplitude to each other.

However, even if we analyse the addition of further degrees of receiver diversity in ideal conditions (completely uncorrelated signals) – as shown in the figure above for 1-, 2-, and 10-way diversity in an environment with very deep fades – we achieve typical values of 1 to 2dB with each additional degree of diversity.



Secondly, there is equalisation. Channel equalisation is a filtering technique that decouples the received data into uncorrelated sub-streams that can be easily decoded. The equaliser is a device that attempts to reverse the distortion incurred by a signal transmitted through a channel. Its purpose is to reduce ISI to allow recovery of the transmitted symbols.

Equalisation counters the effects of time dispersion (also ISI), while diversity reduces the depth and duration of the fades experienced by a receiver in a flat fading (narrowband) channel.

Thirdly, channel coding improves mobile communication link performance by adding redundant data bits in the transmitted message. It is used by the Rx to detect or correct some (or all) of the errors introduced by the channel (post detection technique).

It is the objective of the first two techniques to bring independently, or in tandem, the bit error rate (BER) of the signal to within four per cent or better. Channel coding applied thereafter (as is done in systems from all TETRA suppliers) ensures a clear audio signal conforming to the required intelligibility for its use in critical communications.

Conclusion

In summary, fast fading can be reduced in TETRA systems by implementing the following techniques individually or in combination:

Improved antenna configurations (diversity):

- Two receiving antennas spaced horizontally or vertically
- Three receiving antennas spaced horizontally and/or vertically
- Six receiving antennas spaced horizontally

For channel equalisation to combat Inter Symbol Interference, the TETRA standard identifies two base station channel equalisers:

- TU50 – typical urban with 50kph speed
- HT200 – hilly terrain with 200kph speed

Channel coding (error correction):

- Block encoding (uses checksums)
- Convolution coding (extra bits added for forward error correction)
- Interleaving and re-ordering (possible error bursts are distributed)

A number of vendors propose the use of triple diversity while others advocate the use of a combination of dual diversity combined with an equalisation algorithm. Incidentally, the latest cellular systems combine both techniques.

Compared to triple diversity systems, there are advantages of using double diversity with equalisation filters.

Firstly, diversity reduces the depth and the duration of a fade, and equalisation counters the effects of time dispersion. So a system using both techniques is more versatile, improving performance not only in fringe coverage areas and in buildings but also in noisy and high mobility environments.

Secondly, as the degree of diversity implemented increases, there are costs associated with a more complex antenna system, but also with the towers supporting the antennas. The wind-loading impact to towers caused by additional antennas and cabling is doubled in the transition from double to triple diversity.

Thirdly, the combined nominal gains resulting from the combination of double diversity and equalisation filters (5-7dB) equal, and at times exceed, those derived from triple diversity systems (4-6dB).

Thus, two-way diversity with equalisation provides a versatile deployment model overcoming coverage issues in-building and within fringe areas, high-noise and high-mobility environments. It provides comparable performance to three-way diversity, whilst reducing capex and opex. ■

Ian MacPherson,
Product manager
systems team,
Sepura

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Google to set up global network

Google is launching a global network through which it will provide broadband connections and mobile telephony services. The search giant reckons *Project Nova* will enable users to "seamlessly" switch between cellular and Wi-Fi signals, and between masts of competing networks.

"We are creating a backbone so we can provide connectivity," says Sundar Pichai, the recently promoted second-in-command to Google co-founder Larry Page. "We will be working with carriers around the world so they can provide services over our backbone

"We want to focus on projects which serve billions of users at scale and which make a big difference in their every day lives."

Pichai claims Google does not want to compete with existing operators and other national carriers around the world. "We don't intend to be a network operator at scale," he says.

"All innovation in computing happens at the intersection of hardware and software. That is why we do *Nexus* devices. We do it at enough scale to achieve impact. We are at a stage now where it is important to think about hardware, software and connectivity together."

Speaking at Mobile World Congress in February, Pichai also set out the company's plans to bring four billion people online.

"We think we can bring first-world connectivity to many rural areas. You can imagine planes and balloons which we can stitch together to create this mesh of floating cell towers. It sounds like science fiction at first but we've made tremendous progress," he said.

Sundar Pichai, SVP of Android, Chrome and apps, says Google does not want to be a network operator "at scale".

Round-the-world solar flight relying on satcoms

Intelsat and ITC Global are providing ground-to-ground satcoms services to the team attempting the first round-the-world solar flight.

Solar Impulse-2 began its quest in early March and has already flown a total of 1,468km on its first two legs from Abu Dhabi to Muscat and on to Ahmedabad in around 37 hours. It aims to complete its round-the-world journey sometime in August.

ITC Global specialises in providing satcoms to remote and harsh environments. Working with Intelsat, it has enabled *Solar Impulse-2*'s ground crew and support teams to communicate from anywhere to anyone in the world

Using a 1.8m, quick-deploy antenna, the crew will be able to leverage Intelsat's global satellite network for broadcasts, webcasts, email, phone, data and video communications during the 35,000km (22,000 mile) trip which is expected to take around 550 flight hours to complete. Intelsat and ITC Global are also providing round-the-clock operations centre support during the trip.

ITU creates database for e-Health devices

The ITU has launched its ICT Product Conformity Database which showcases ICT products and services that comply with ITU-T standards.

e-Health devices covering 23 classes of technology are already in the database and will help buyers select standards-compliant products. The products were tested by third-party labs for compliance with the ITU-T H.810 Interoperability design guidelines for personal health systems.

This key ITU standard was approved in December 2013 and are based on design guidelines developed by international not-for-profit industry group Continua.

The suites used for testing the conformance of e-Health products will be published as 32 standards in the ITU-T H.821-H.850 series. They include more than 1,000 test cases for the functions implemented by personal health devices such as thermometers, blood pressure and pulse meters.

They also test the conformance of gateways that consolidate measurements from various devices and transmit health data

Continua's guidelines describe the various interfaces between the LAN, personal area network, touch area network health devices, and application hosting devices including NFC, USB and low energy Bluetooth Smart Technology; along with consent enforcement via a WAN and Health Record Network devices.

SK Telecom and Nokia commercialise eICIC

SK Telecom and Nokia Networks claim to have become the first companies to have commercialised Enhanced Inter-Cell Interference Coordination (eICIC).

eICIC is a technology that controls signal interference between macro and micro base stations to enhance LTE-A network performance. By deploying eICIC, SK Telecom expects to be able to offer higher quality connections.

By using the new technique, the operator says it will be able to reduce inter-cell interference by 15 per cent in traffic-congested areas where macro and micro cells are concentrated.

SK Telecom has applied eICIC to its LTE-A network in Gwangji Metropolitan City, and plans to roll out the technology to the rest of its nationwide LTE-A network by the first half of 2016.

SK Telecom has strengthened its cooperation with Nokia to develop and commercialise 5G technologies.

Nokia and SK Telecom say they have now moved a step closer to realising fifth generation mobile technology as they believe eICIC will be an essential component in the era of 5G where heterogeneous networks will become more complex.

The two firms have signed a memorandum of understanding pledging to work together on 5G. They will collaborate on research to develop core 5G technologies and say they will make "all-out efforts" to demonstrate 5G in 2018 and commercialise a service in 2020.

A test bed at SK Telecom's Corporate R&D Centre in Bundang, Seoul, will be set-up to verify and demonstrate 5G technologies.

In particular, SK Telecom and Nokia say they will develop 'cmWave/ mmWave which uses wideband spectrum resources in ultra-high frequency bands (6GHz or higher) for data communications. This is currently being discussed as one of the core 5G technologies by standards body 3GPP.

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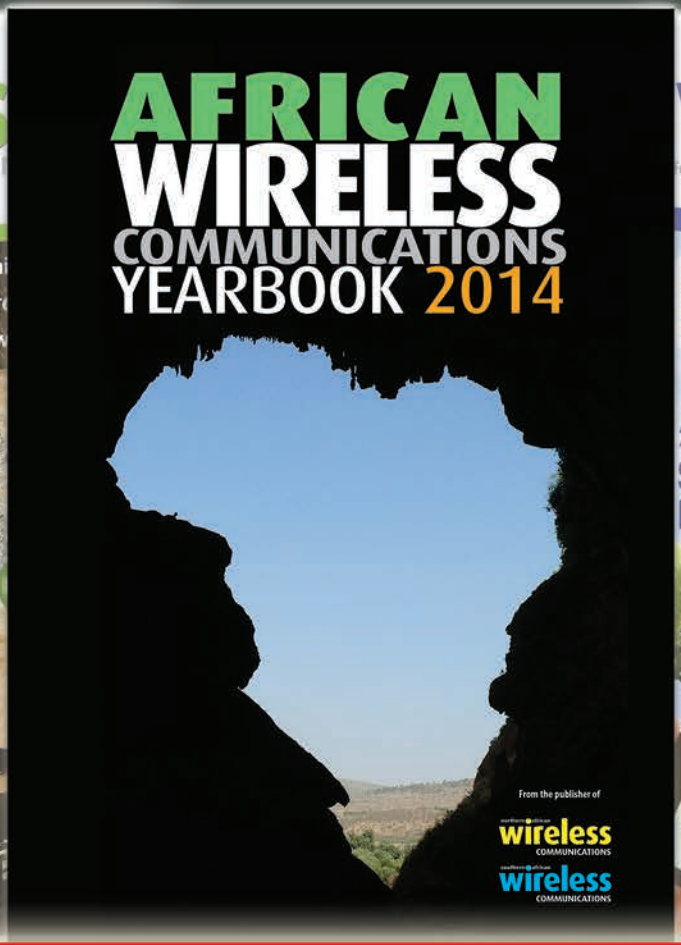

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Monastery goes global with wireless

Monks in Russia have turned to InfiNet Wireless to set up a network that will enable them to broadcast their services via broadband.

The Monsegur Monastery lies in a remote area of the Dmitrovsky district in Moscow. Its location is some distance from any populated area, and attendance of its services has been subject to a slow decline over recent years primarily due to the secluded location.

In order to use broadband for its broadcasts, the monastery needed a direct comms link to the main infrastructure hub, a distance of more than 15km across difficult terrain. It also needed a system that could endure Moscow's very harsh climate where winter temperatures can dip below -18° Celsius.

InfiNet proposed using wireless technology as this would not only work with minimal intervention at the high bandwidth and speeds required over the distance, but also save time and money.

It deployed its *InfiLink 2x2* point-to-point BWA system, and claims the system is easier to upgrade compared to laying more physical cabling or deploying extra wireless units. Increasing capacity is just a matter of 'switching on' additional wireless links in the base station's software, says the firm.

According to InfiNet, the link has enabled the monastery to broadcast video and content with a consistent throughput of at least 200Mbps.

It adds that while extreme weather often creates problems for wireless line-of-sight systems – such as signal dispersion, signal degradation or interference from heavy snowstorms and freezing fog – its link has been "coping admirably" with the harsh climatic challenges.

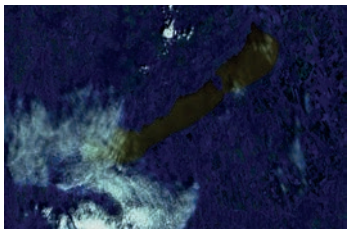
The monastery now broadcasts to more than 500 members daily and has been able to rebuild a strong following from both the local and global internet community. It has even expanded its range of services and is providing content via online radio and cached video, in addition to its live-streaming broadcasts.

Scientists use "superhero vision" for lake analysis

An international team of scientists have used what they describe as "superhero vision" to assess the water quality of lakes in Europe, and to discover why the reeds that surround them are dying.

Using the Medium Resolution Imaging Spectrometer (Meris) which is hosted on *Envisat*, the Earth-observation satellite operated by the European Space Agency, the researchers have demonstrated a way to visualise pollutions levels that are otherwise invisible to the human eye.

The team comprises scientists at the University of Leicester, the Hungarian Academy of Sciences, and industrial partners. They have dubbed the imaging technology "superhero vision" because it has enabled them to see wavelengths which our eyes cannot see, as human sight can only detect red, green and blue light.



When algae grow in lakes, they contain the green substance known as chlorophyll-a, as this satellite image of Lake Balaton shows. PHOTO: VIKTOR TÓTH

While these methods have previously been used for seas and oceans, they are not readily available for lakes, especially shallow ones with complex optical environments defined by a mix of different natural substances in the water.

The subject of the experiments was Lake Balaton in Hungary. The team also examined the phenomenon of 'reed die-back' around the lake.

They used imaging spectroscopy and hyperspectral data collected from sensors on board aircraft and satellites that can measure radiation such as near-infrared wavelengths. The data will be analysed to learn more about the ecological status of the reed plants.

Turksat deploys Jupiter for Ka-band

Turksat has selected the *Jupiter* high-throughput ground system from Hughes to enhance its satellite services across Turkey and neighbouring countries in Europe and the Middle East.

The deployment of the system will enable Turksat to provide a variety of high-speed Ka-band satellite services to consumers, private sector users, and governmental organisations such as schools. The operator plans to offer these services after it launches *Turksat 4B* in early 2016.

According to Hughes, *Jupiter*'s modular design makes it the "ideal, future-proof platform" for operators to gain technology and cost advantages. It says the system employs a novel 'system on a chip' to power the remote terminals and numerous other advances including an enhanced air interface featuring wideband carriers.

Turksat provides TV broadcasting and data communication services throughout Europe, Turkey, Africa, and Asia. It also offers cable TV broadcasting and internet services, which are provided to subscribers via its fibre optic cable infrastructure.

The Turkish e-Government gateway is also operated by Turksat, and offers access to all government services electronically.

Hughes Europe MD Chris Britton says: "Turksat is an innovative company that wanted a best-in-class solution. [It] chose *Jupiter* for its technology innovation to harness the power of the industry's new breed of satellites, bringing high-speed satellite services to a wider audience."

Leo Express boasts faster Wi-Fi speeds

Czech train operator Leo Express claims internet speeds on its intercity fleet have more than doubled since the installation of Nomad Digital's *PEP Charger* software.

The firm hopes the faster internet speeds will help it lure passengers away from the competition, and enhance passenger experience across its fleet.

Nomad says *PEP Charger* is designed to utilise all of the available bandwidth and claims that it improves the flow and share of information onboard. In a recent test of its software, the company says that the number of five-megabyte files downloaded in less than 30 seconds increased by 86 per cent, with incomplete download rates cut to three per cent across the entire route.

"People increasingly travel by train to allow them to work or use their laptops and smartphones while on the move," says Leo Group chairman Leoš Novotný. "We've seen a dramatic increase in occupancy, and one of the primary influencers seems to be our exceptional passenger services, with the reliability and speed of Wi-Fi being an integral part."

Leo Express launched at the start of 2013 and selected Nomad to provide the passenger Wi-Fi service on its *Stadler Flirt* fleet. "In the first three months we carried more than 300,000 passengers and saw the levels of occupancy on our trains rise to 75 per cent," says Novotný. "Unrivalled Wi-Fi and passenger comfort is something we consider paramount to our future success."

Intercity train operator Leo Express says Nomad's onboard Wi-Fi system has led to higher occupancy rates on its fleet.

AeroMobile on A380

The world's largest passenger aircraft now has AeroMobile's in-flight mobile phone network installed, giving passengers and crew the ability to roam while in the air using their mobile devices. The Etihad Airways *A380-800* aircraft's inaugural flight with AeroMobile technology onboard was from Abu Dhabi to London Heathrow and touched down on 13 February 2015. Etihad also has AeroMobile connectivity on board 59 of its other aircraft.

BT finalises EE deal

British Telecom has bought EE, the UK's largest mobile phone network, for GBP12.5bn. The deal further consolidates BT's dominant position in the UK as a communications giant covering traditional fixed phone lines, mobile, broadband and television. BT chief executive Gavin Patterson says the acquisition provides an attractive opportunity for the firm: "[It will] generate considerable value for shareholders, with significant operating and capital investment efficiencies supported by our tried and tested cost transformation activities."

ZTE finishes VoLTE tests

Global telecoms technology provider ZTE says it has completed China Mobile's Voice over LTE (VoLTE) tests ahead of its competitors. The vendor's IMS (IP Multimedia Subsystem) solutions deployed in the China Mobile test are said to have delivered "robust and stable network performance". Deployment of VoLTE services is accelerating globally. By September 2014, there were 51m subscribers and 11 commercially deployed networks, according to data from market watcher Infonetics Research.

SpeedCast satcoms to be used on Gearbulk vessels

SpeedCast International will provide a new Ku-band satellite service to Switzerland-based global shipping specialist Gearbulk.

Under a multi-year agreement, the firm says it will provide high-performance broadband connectivity for mission-critical and social communications on board 50 cargo vessels and several tankers across the world. The new service will support what Speedcast describes as "Gearbulk's transition into the global broadband VSAT communications era".

Gearbulk is said to operate one of the world's largest fleets of open-hatch craned vessels, transporting unitised cargoes such as forest products, non-ferrous metals, and steel. Its vessels will benefit from enhanced operational and crew welfare communications, all delivered in a financially controllable package by SpeedCast.

The Ku-band system will be used on 50 Gearbulk vessels and several tankers.

The Hong Kong headquartered-firm claims it delivers "unparalleled" global connectivity options using a network of more than 40 satellites which provide "reliable" Ku-, C- and Ka-band capacity.

"With thousands of port calls to over 70 countries, Gearbulk's business is complex, so an effective and reliable communications system will strengthen the operational efficiency of its vessels," says SpeedCast CEO Pierre-Jean Beylier.

"Looking ahead, sustainability is a key priority for Gearbulk, and with our satellite communications we can help the company concentrate on shipping for the future."

TE provides coverage at the Superbowl

A distributed antenna system (DAS) from TE Connectivity scored big time at the 49th National Football League (NFL) championship game held in the US during February.

The vendor's *FlexWave Spectrum* was deployed at the University of Phoenix Stadium to support crowds at the big game. It provided 48 sectors of mobile coverage and capacity for a neutral host provider serving the nation's four largest mobile operators.

The installation included 96 main hubs, 49 expansion hubs, and 225 remote antenna units to cover the stadium bowl, luxury boxes and service areas.

TE says its system supports various cellular frequencies including 700MHz, 800MHz, 850MHz, 1900MHz and 2100MHz LTE, CDMA, EVDO and UMTS.

In the Glendale area, where the stadium is located, TE equipment was used to link a base station hotel with a DAS in the Renaissance Hotel and the Gila River Arena, making use of existing operator infrastructure to manage capacity spikes.

In downtown Phoenix, TE's *FlexWave Prism* DAS was deployed at the Hyatt Regency Hotel, which served as the headquarters for NFL executives in the month leading up to the game, and at CityScape, an outdoor visitor centre. Elsewhere, the company's *FlexWave Spectrum* DAS which features a CPRI digital interface unit (CDIU) was deployed at US Airways Arena, which was used as the event's media centre.

In addition, TE says its "unique" host-to-host technology was used to link a 'base station hotel' in downtown Phoenix with the US Airways Arena, the Hyatt Regency, Chase Field and the Phoenix Convention Centre.

The company says its host-to-host technology transports base station signals for miles over a digital fibre link between the base station hotel and the various venues.

Hytera TETRA secures UN conference

A TETRA system from Hytera provided secure communications to police and safety agencies guarding the UN conference on climate change held in Peru last year.

The 20th Conference of the Parties (CoP20) was attended by representatives of 195 countries and international organisations, along with approximately 15,000 visitors.

In Lima, Hytera deployed 14 *TETRA 2 DIB-R5* advanced sites and a geographically redundant IPN to provide secure voice and data communications. Additionally, two mobile communication control centres equipped with a rapid deployment *DIB-500 R4.1* TETRA base station, a remote operation control centre, and *300 PT580H* Hytera portables were strategically installed at the Army General headquarters.

Further, Peru's national police were equipped with more than 3,500 *PT580H* terminals, over 600 *MT680* mobile terminals installed in patrol vehicles, and 300 police stations were supplied with a fixed *MT680* terminal which operated during the event.

To improve the response times in case of an emergency, Hytera also installed seven distributed operation control centres across Lima with applications like AVL-GIS TETRA dispatcher, and an integrated CCTV that interconnected with the Main Emergency Control Centre equipped with more than 60 of the vendor's *APD* dispatcher consoles.

A police officer using a Hytera terminal across the secure comms network.

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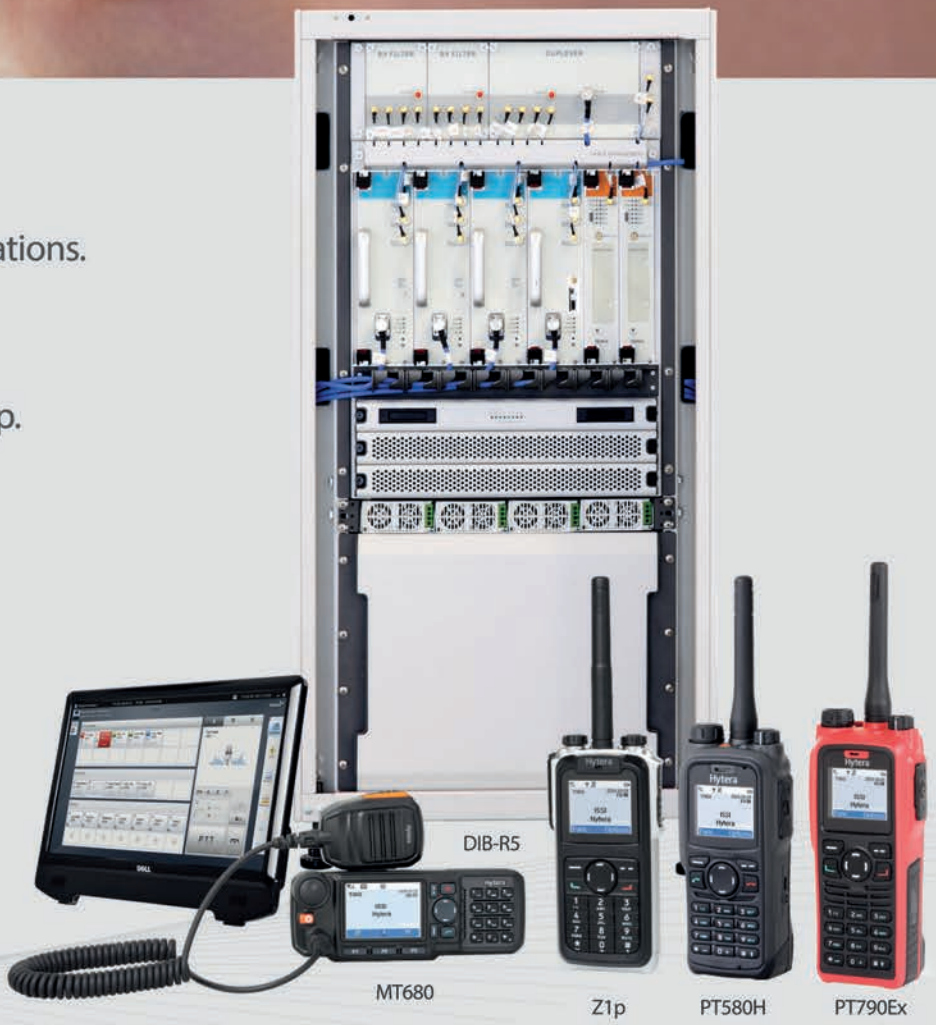

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