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Get smart on smart cities



Il the pundits are in agreement: smart cities will be big, and nowhere more so than in Asia.

According to Navigant Research, Asia Pacific is home to most of the world's largest and fastest-growing urban areas, and smart city technology is becoming a crucial element of their future development. It forecasts annual smart city technology investment in Asia Pacific to almost quadruple by 2023, reaching \$11.3 billion.

"Working with an evolving mix of international and regional smart city technology firms, Asia Pacific governments are piloting a variety of technologies to solve urban problems, reduce urban energy and resource use, and prepare for future growth," it says. "Leading cities and providers are taking the initial steps in integrating networks of intelligent technologies to create true smart cities."

Such is the potential of this market that in 2012 UK Trade & Investment commissioned a 158 page report 'Smart Cities Of The Future In Asia: The Opportunities For UK Business'. It forecast that by 2020, 40 cities would be smart and that cities in Asia would be "at the centre of this phenomenon."

Trouble is, there is no precise definition of smart city. Elsewhere in the edition we report Mr Ahmed Bin Byat, chairman of the Smart Dubai Initiative, saying that the project provides developers with a checklist of 1000 standards they need to meet if their projects are to be considered 'smart'.

Another research firm, IHS Technology, defines a smart city as one that has deployed, or is piloting, integrated ICT systems across three or more sectors—energy, transport, physical infrastructure, governance and safety/security functions—to improve efficiency, manage complexity and enhance citizen quality of life. IHS expects there will be at least 88 smart cities worldwide by 2025, up from 21 today, and forecasts annual investment on smart city projects to rise from the current \$1 billion to \$12 billion in 2025, which is little more than Navigant is forecasting for Asia Pacific alone in 2023.

Every attempt at forecasting an IT market runs into definitional problems and there can be few bigger than trying to define the global smart city market. Where do you draw the line: on technology; on services; on who is spending the money?

The UK guide looks at opportunities across six sectors: Energy; Digital Media; Buildings and the Environment; Health; Education and Transport. Within each of those it would be germane to ask: what constitutes 'smart city' expenditure and projects, and what is, for example, simply spending on digital media that would not be classified as part of a smart city project?

An equally relevant question would be: what vendors are interested in the value of so nebulous a market as 'the smart city'? Each would likely be interested in getting a handle on specific opportunities for their own products and services.

Suffice to say that there is ample scope for suppliers of a very broad range of goods and services, both now and for the foreseeable future. As UK Trade & Investment puts it, there are opportunities "Whether your focus is on the coming weeks or years; your strength in digital media or healthcare; you competencies in products or services..."

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Stuart Corner Senior Editorial Manager Telecom Review Asia Pacific

Jasper and China Unicom form IoT partnership



Jasper, a global Internet of Things (IoT) platform provider, has formed a partnership with China Unicom to provide IoT services for enterprise customers in China. China Unicom will offer a global platform through which companies can launch, manage and monetize IoT service businesses throughout China.

According to Jasper, its Control Center platform will provide customers with essential IoT capabilities like mobile service management, real-time diagnostics, robust rating and intelligent business process automation. "In combination with China Unicom's high-performance mobile network, the Jasper platform enables rapid time-tomarket for businesses, and provides a flexible, turnkey solution that can be configured to meet the specialized needs of businesses across any industry," the company said. "Cloud-based delivery brings the advantages of agility, efficiency, global consistency and anywhere-access so businesses can scale their connected services at will."

According to recent research by the GSMA, China is now the world's largest machine-to-machine (M2M) market with 50 million devices connected.

China also boasts the world's largest car market. Automotive technology research firm SBD notes that China is set to become the global leader for embedded telematics before the end of the decade.

Indosat partners with Smaato for mobile ad exchange



Indonesian mobile operator Indosat, a member of the Ooredoo Group, has formed a joint venture with global mobile real-time bidding advertisement exchange Smaato to launch a mobile advertising exchange in Indonesia. Indosat's existing mobile advertising offering, i-klan, which sits within its Digital Services unit, will become part of the joint venture, Indonesia Mobile Exchange (IMX). IMX will continue to be supported by Indosat's Digital Services Unit, which also focuses, among other offerings, on mobile commerce and mobile payment solutions.

According to Indosat, "IMX's digital mobile advertising exchange will facilitate a portal that enables both local and global advertisers to connect with leading publishers in Indonesia and provide targeted programmatic advertising to Indonesian consumers. ... IMX will leverage Indosat's reach

in Indonesia through its 55 million

mobile customers, Indosat's business customers and the global reach of Smaato's mobile exchange technology through which it is already serving close to five billion impressions a month in Indonesia."

Dr Nasser Marafih, group CEO of Ooredoo, said: "Currently 25 percent of our customers actively use mobile content services and Indosat's partnership with a leading global player like Smaato helps us to build products and capabilities that better serve both business customers and consumers alike."

Telstra to launch LTE broadcast



Telstra looks set to become only the second mobile operator, after Korean mobile operator KT to launch a commercial LTE broadcast service.

It has announced that it will deploy Ericsson's LTE broadcast technology on its LTE-A network. "With this capability in place Telstra will be progressively enabling permanent LTE broadcast channels at key venues and major events, initially for testing and then for customer access on compatible devices during 2015," Ericsson said.

Ericsson added: "The LTE broadcast trials run by Telstra and Ericsson in Australia have shown that three or four channels of video can be efficiently streamed along with complementary data channels. This traffic used as little as 10 percent of the 20MHz carrier to cover all users. The adoption of high-efficiency video coding (HEVC) compression further improves network efficiency and potential picture quality."

HEVC encoding reduces the bandwidth required to deliver high quality video by

around 30-40 percent, compared with existing MPEG-4 AVC coding, enabling operators to either deliver higher quality video or more channels in the same spectrum.

According to Ericsson, LTE broadcast has a number of potential key use cases including new customer content experiences at sporting events such as tennis, cricket, horse racing, car racing and other special events. "Using the technology, event goers will be able to access multiple high quality video streams and event related data," it said.

Globe Telecom first to deploy Huawei's SingleSON



Philippine telecommunications company Globe Telecom will be the first operator in the world to deploy Huawei's SingleSON (self-organizing network) enabling it to better manage its complex network and deliver on its promise of superior customer experience.

Globe formalized its collaboration with Huawei for the SingleSON

deployment during Mobile World Congress in Barcelona. According to Huawei, "The solution enables the telco to manage the explosive growth and development of mobile data services traffic, which is foreseen to continue into the next decade."

The technology was recently tested live on Globe 20,000 2G, 3G and 4G cells, the largest deployment thus far for Huawei SingleSON, according to Huawei. In a statement Huawei said: "According to Globe, the performance of the solution achieved remarkable results and exceeded expectations with immediate improvement on both drop call rates and users' throughput. It also exhibited better sharing of radio resources between layers and technologies. Given these excellent outcomes, Globe said it plans to deploy the SingleSON solution nationwide in 2015."

Globe's chief technical advisor, Robert Tan, said: "The capabilities of the SingleSON solution in improving our network's O&M efficiency and performance are impressive. It will allow us to continuously deliver a great user experience without additional manpower resources to manage an increasingly more complex network."

IDC tips APEJ enterprise and cloud SDN market at \$1b by 2018



According to IDC, the softwaredefined networking (SDN) market in Asia/Pacific excluding Japan (APEJ) - consisting of spending from the enterprise and cloud service provider segments - will grow from \$6.2 million in 2013 to over \$1 billion by 2018.

Surjyadeb Goswami, research manager, APEJ Enterprise Networking at IDC, said: "Businesses are more closely correlated today with technology than ever and this will be a strong contributing factor to driving growth in the SDN market because of the benefits it brings to the table. End-users recognize the benefits of SDN, but are not jumping on the bandwagon aggressively, mainly as migration from a legacy platform to SDN is not straight forward."

According to Goswami, with IT buyers under the impression that the

standards are still evolving, non-risk takers are deciding against investing in SDN in a big way. "However this is only a temporary obstacle as the benefits are too important to ignore," he said.

IDC believes ICT evolutions, such as storage and server virtualization, will also naturally lead to the need for the networks to be virtualized and more efficiently controlled. "That will lead to SDN becoming a game changer, providing key building blocks for delivering next generation network infrastructure to enterprise and hybrid, private, and public cloud services," it says.

NEC to supply microwave backhaul for Axiata mobile networks



NEC has signed a global framework agreement with Asian telco Axiata Group for the provision, installation and maintenance of NEC's iPASOLINK series of microwave communication systems to Axiata telecom operators in Malaysia, Indonesia, Sri Lanka, Cambodia and Bangladesh. Previously, NEC has provided iPASOLINK equipment under individual arrangements to XL Axiata (Indonesia) and Dialog (Sri Lanka).

Under the new agreement it will be able to conduct marketing efforts towards additional Axiata Group companies.

Toshiya Matsuki, CEO of NEC Asia Pacific, said: "It's a great honor for us to be chosen by the Axiata Group as its strategic supplier. NEC is strongly committed to making further contributions to enhance the Axiata Group's mobile networks, while trying to achieve higher functionality, an expanded product line-up and better maintenance services for the iPASOLINK Series."

NEC says its microwave communications systems have been selected by telecommunications operators all over the world to quickly expanding their mobile phone infrastructure, with shipments of approximately 2.3 million units into 152 countries.



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Will be all around us"

Exclusive interview with Mr Ahmed Bin Byat, chairman of the Smart Dubai Initiative.

ith its ambitious plans and gungho optimism the Smart Dubai Initiative is in many ways the most

exciting project in the global smart city landscape, and Telecom Review has managed to score an exclusive interview with the man heading the project. Mr Ahmed Bin Byat is the chairman of the Smart Dubai Initiative and the person responsible for outlining and delivering on the vision of HH Sheikh Mohammad to make Dubai 'the smartest and happiest city in the world'.

Byat explained that Dubai's plan to be the city of the future was not simply a strategic modernization initiative but more relevant to the subject of size.

"Dubai right now is about two million inhabitants," he said. "Earlier, when the city was smaller, its objective was to establish very strong service provider entities such as RTA, DEWA, etc and to let them run as if they were independent. Today we are much bigger and it is impossible to continue to run separately like this. There has to be some consolidation. Otherwise things will run into duplication and that is obviously expensive."

According to Byat, if a city is expensive to run that burden of cost will inevitably be borne by consumers, which is exactly what Dubai wants to avoid and the reason the initiative was unveiled. "We want to use the city's infrastructure efficiently, so people can live here without having to spend money running around here and there to get things done," he said. "That will not make them happy. We want an efficient experience that will result in happiness."

Byat said he did not believe this would lead to the imposition of new taxes, either direct or indirect. "I don't think it is the right time for us to implement a tax system. There is talk about it, but it is very difficult to implement a system seen in other countries in a place like Dubai, for many reasons.

Fees not new taxes

"The fee system we have is working fairly well, and what we need to ensure is that the fee system is harmonious that it continues to follow a logic based on paying for what you get instead of a tax system which is levied on residents whether they use those services or not. The fee system we are currently following works well for Dubai."

Byat acknowledged that the smart city project is one of evolving scope. "For us, the smart city initiative is a moving target, one we see no end to. We want to see the city deliver to its residents, anyone living here, a more efficient interaction, and in terms of a more overarching principle, an interaction that is more productive. Dubai is one of those cities where the needs of the people change over time because the people change over time."

The level of self awareness with regards to the city, while not surprising, is remarkably refreshing and Byat spoke at length about how it was possible for city administrators to be able to map where and how any cross section of society, whether horizontally or vertically, was interacting with the city at any point in time.

"We use data analytics. We don't pry into private information about the public – we don't need to know anyone's name or passport number, just how a demographic is interacting with the city. For us, this data is what helps us make decisions about the city, where the traffic jams will be at what time, etc. It helps us figure out which parts of the economy need to be improved."

This self-awareness is the result of a deliberate attitude towards selfimprovement, said Byat. "Compared to





any other city, Dubai is very efficient in terms of infrastructure, roads, power, telecommunications, etc. These are the big enablers but also what we are looking to improve and make more efficient. So we aren't really competing with anyone. Instead, we are actually looking downwards towards our own city rather than outwards towards others."

Aiming for a vibrant economy

Having the city itself lead to a vibrant and dynamic economy is one of the biggest goals of the smart city, according to Byat, and it's a goal he is working hard to promote. He speaks about it and is working on programs to boost entrepreneurship and empowerment in the city. "One of the most important things we are working on is the open data policy, where we will disseminate useful information about the city to the public. Of course we will have measures to control for privacy and critical data, but a lot of the information we will be able to generate can be useful for businesses. So why not benefit the economy with it? It will almost certainly boost entrepreneurship in the city and that is certainly what we want, considering that 90 percent of the businesses in Dubai are SMEs. We want to cultivate that and turn Dubai into an entrepreneurship city."

According to Byat, one of the biggest challenges to promoting entrepreneurship in general is a lack of access to information. "Information





is what allows questions to be answered. When you don't have those answers, the business risk increases because you cannot correctly estimate impacts to your business. So what we want to do is to allow someone with a business idea to have access to current and relevant information that would help an entrepreneur with a question work on a solution. This will be possible with the open data platform and is why it is such a key deliverable of the smart city."

As a firm believer in competition, Byat talked at length about how the smart city would foster more business activity in Dubai, including when applications begin to emerge and services beyond those already in vogue such as Uber and Airbnb begin to propagate. "Since the beginning, Dubai has always believed in an open economic policy. In aviation, for instance, we have always had an open-air policy, with airlines from any country allowed to operate in our skies and that is what has enabled Emirates to succeed. So as long as they are fair, the more options people have, in any arena, the better it is for the city."

Looking to World Expo 2020

Specifically in terms of the World Expo, Byat said the Initiative aimed to deliver on HH Sheikh Mohamed's plan to have the best expo the world has ever seen in Dubai in 2020. "There is a subcommittee working for the event and there is a lot of collaboration between all the infrastructure providers including DEWA, RTA, etc to come together and deliver an unparalleled experience."

By 2016, the first phase of the smart city will be unveiled in the form of a dashboard through which residents will be able to interact with the agencies. The idea behind the dashboard is to have one location where residents can conduct all of their affairs: from looking at traffic routes to renewing their vehicle registrations and more.

"We will have an integrated platform open to everybody, public and private. We want everyone living or visiting the city to interact with the city instead of a department. So in essence, the front window will be Dubai with the agencies working together behind this to deliver a comprehensive experience."

However, that is just one part of the master plan for Dubai. "The smart city will be everywhere and all around us," says Byat. "For now, we are focusing on 'Greenfields' such as D3 and the downtown area. We have a checklist of 1000 standards you need to adhere to be considered 'smart'. We publish this to all the developers so that then they can embark on the same journey in other areas."

When asked if making Dubai Smart would help the city grow even further, Byat said he was confident it would, but with growth as a secondary goal. "The objective is to do what we already do, better. This is an improvement program. We know we can do better in delivering services to the public, be it going from point A to B, applying for a loan or setting up a business. In fact, why even go from point A to B if you don't need to? We want to eliminate all the waste possible."

Redefining location identifiers

One of the more interesting points in conversation emerged when Byat talked about how the smart city was in many ways an urban planning guideline and would redesign the way locations were conventionally thought of. "We want to address the city in a coded way beyond just names and numbers on a map. In terms of a resident's experience, for instance, every address in our GIS system will become a coordinate in the form of a unique identifier. We have a lot of tools that we are working on to allow this to happen, and the plans will fit into our grand scheme of things which will emerge soon in the future."

With the level of expectations Dubai has set with its plans, it isn't hard to find oneself wondering what the city will look like a few years from now and how far it will get in that regard. Byat is under no illusions, even talking, for example, about how happiness meters and more will be used to turn Dubai's aim to be the happiest city in the world into a measureable goal. We are living on the cusp of transition, and with all going according to Byat's plans, the future is becoming a reality in Dubai. orang

Business Services

Orange's Asian ambitions

In December 2014 Orange Business Services announced that it had promoted vice president of sales & marketing for Asia Pacific, Dr Patrick Sim, to the role of senior vice president Asia Pacific. He talks about his new role and the company's plans for Asia Pacific

> range, formerly France Telecom, is one of the most ubiquitous of global telecommunications companies, with a network presence in

226 countries. It owns mobile networks in 32 countries with a total more than 170 million customers and operates 15 R&D labs and 'technocenters' spread across five continents. Orange Business Services (OBS), the division that serves multinationals worldwide has 3,000 multinational customers worldwide and over 3000 employees in Asia.

In Asia Pacific Orange operates more than 120 MPLS PoPs across 39 countries and its Ethernet services (Ethernet Private Line, Ethernet Virtual Private Line, and Virtual Private LAN) spans 16 countries. It has local presence in China, India, Australia, Singapore, Hong Kong, Malaysia, Taiwan, Japan, and Korea and serves at least 2,000 enterprise customers in the region, at least 800 of which are A-end contracts.

Newly appointed senior vice president Asia Pacific, Dr Patrick Sim, said the region was also a key part of Orange's global support organisation. "We have about 1500 staff sitting in our major support centres that are part of our global support infrastructure providing 24 x 7 support."

Sim has been with OBS for the past eight years as vice president of sales and marketing for Asia Pacific. He took the reins of the Asian arm of OBS as part of a global shake-up. Orange announced in February 2015



the appointment of Helmut Reisinger as the new executive vice president, international for OBS along with new regional heads for Europe, Russia and CIS; The Americas; and Africa and the Middle East.

Global Streamlining

OBS's global CEO, Thierry Bonhomme, said the moves were aimed at creating a more streamlined international organisation that would "enhance collaboration across all regions and deliver even greater and faster service to our customers with customer-centric teaming."

Sim told Telecom Review Asia Pacific that the announcement would make teaming within OBS much stronger. "Previously there was a thin layer of support structure to bring all the regions together. Some of those overlay activities will now be strengthened to try and link the four regions more strongly."

Of his new role, he said: "Our revenue has seen double-digit growth year-onyear for the last seven or eight years and the expectation is to accelerate that and there has been additional investment to drive that growth. That is the exciting part."

He added: "The region is an engine of global growth for Orange with huge demand for network expansion, cloud services, unified communications and customer experience solutions. We have made significant investments and partnerships in the Asia Pacific, and are positive about growing the business substantially in the coming years."

He said the re-organisation would enable OBS to more easily provide a global service to multinationals wanting to expand their operations across multiple regions. "If we have a customer in one region and they need services in another, we can quote for these services globally without any problems."

However with responsibility for operations in 36 countries ranging from the region's most to least developed, delivering these services and maintaining growth brings considerable challenges. Sim lists achieving service consistency as one of his biggest. "To be able to get double-digit growth in each of those countries means we need to have a lot of staff in the region with a lot of skills and knowledge of these transformation technologies, and to be able to convince the customer that we can build solutions," he said.

Highly rated by analysts

Sim also has a lot to live up to: he takes the reigns of an organisation that has been rated a leader by several leading analyst firms.

Gartner puts the company in the leaders quadrant of its January 2015 Magic Quadrant for Network Services (Global), its Magic Quadrant for Managed Machine-to-Machine Services of October 2014 and its Magic Quadrant for Unified Communications as a Service, Multiregional, August 2014.

In IDC's Marketscape Asia/Pacific Next-Generation Telcos: Telecom Services 2014, Orange is the top rated provider, along with BT and closely followed by Singtel.

In its November 2014 Benchmark, Ocean82 rated OBS number one overall. It said that OBS was "perceived to triumph over rivals in satisfying customers with a world class customer value package." According to Ocean82 "Orange Business Services earns a prestigious Gold Award for exceeding the outstanding benchmark for customer satisfaction in 10 areas of service out of 39 measured. ... Orange Business Services is best in class in seven important areas where it outperforms nearest rivals and in branded customer experience overall."

Ovum's decision matrix for selecting an M2M service provider in Asia-Pacific 2014–15 put OBS in the lead both on overall strategy assessment and overall technology assessment, marginally ahead of Vodafone.

The Forrester Wave: Asia Pacific Carrier Ethernet Services report of October 2013 rated OBS a leader among Asia Pacific carrier ethernet service vendors. "A strong attribute of its current offering is its network infrastructure—Orange Business Services has its own backbone circuits, P/PEs, PoPs, and last-mile partnerships," Forrester said. It also ranked OBS as a leader in Managed Global MPLS Services Wave report in the same year.

In its Marketscape report, IDC reported OBS saying it had achieved an 18 percent compound annual growth rate (CAGR) over the past six years in the value of orders taken and a comparable revenue growth rate in Asia Pacific. "More headcount investment has been committed in the second half of 2014 especially in sales and solution architects. Over the past years, Orange has launched a number of new offerings especially in the area of cloud and M2M solutions in the region," IDC said. "Orange has also demonstrated its ability to garner a number of A-end deals and local Asia enterprises contracts with service components beyond just networks. It has also garnered a number of local M2M deals in the region."

M2M is another challenge facing Sim, because the company does not own mobile networks in the region. "While Orange is very strong in fleet management and M2M we don't have mobile service operations in Asia Pacific countries like we have in Europe," He said. "So we have to collaborate with local service providers. But that has not stopped us delivering our management and mobility solutions for our customers."

Customer service criticised

However in all three Magic Quadrants referred to earlier, Gartner relayed negative feedback abut Orange's customer service.

"Clients still report that Orange Business Services can be somewhat inflexible and bureaucratic in areas such as expediting installations."

"Conversations with several Orange customers identify an organization that can be difficult to work with at several levels of a managed M2M service engagement. The primary area is navigating the sourcing and acquisition process, as well as navigating multiple Orange Business Services units to create nonstandard solutions."

"Some customers report that Orange can be bureaucratic to work with and



does not have all of its workgroups well-aligned. It can also take a long time (multiple weeks) to get the required subject matter expert (for engineering and design) onto a particular account."

Sim downplayed these criticisms and suggested that, if anything they were a consequence of OBS being ahead of its competitors. "We do a lot of customer satisfaction surveys by a third party and that survey has been improving yearon-year of the last few years," he said.

"All I can relate it to the fact that when others were focused on deploying networks we were focused on deploying network-related services. By its very nature global coverage is our key differentiation and also our Achilles Heel. And we added complex services while others were still trying to do networks. We were doing business acceleration, cloud IT services collaboration around the world.

"These are very complex services. Globally we have networks in about 226 countries and we try and deliver to places like Burkina Faso that are really remote. You tend to strike more challenges than you do in Singapore and places like that."

He added: "We are now seeing the same thing of some of our competitors because they are facing the same challenges that we used to face."

Helping customer transform

However in a September 2014 assessment of OBS, globally, Current Analysis pointed to dependence on legacy services as a weakness of OBS. "Voice revenues accounted for 26 percent of H1 2014 revenues, and mature data network services (VPN, broadband, broadcasting and mobile data) represented 46 percent of total annual revenues," it said. "In total, 72 percent of revenues are sliding towards loss. These legacy service lines are particularly vulnerable to low margins, commoditization and service substitution."

It added: "The migration to new technologies continues to impact enterprise data products, with legacy data network revenues dropping another 4.1 percent in H1 2014 and the new business areas not yet able to compensate for this shortfall."

When it announced Sim's appointment, and that of Reisinger, OBS said its aim was to be the trusted partner for multinational corporations in their digital transformation and that Sim's role was "to lead Orange Business Service's ambition to become the trusted partner for customers' digital transformation in the Asia Pacific."

If he can deliver on that goal he should be able to compensate for the decline in legacy revenues. Every major analyst firm has identifed digital disruption as a major force that will impact every organisation. Forrester suggests that many will succumb. Those that succeed will need all the help they can get.

Big news from Barcelona

Mobile World Congress 2015 wrapped up in Barcelona just before this edition of Telecom Review Asia Pacific went to press. Here's what some of the major global players had to say, and a preview of what's coming up in July at Mobile World Congress Asia in Shanghai.

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RICSSON

Ericsson president and CEO, Hans Vestberg, reflected on the pace of change in the industry at the

company's opening-day media and analyst briefing, showcasing the latest solutions that the company is bringing to market, and making predictions for 2015.

Vestberg said: "We predict four key changes during 2015: more people will

watch streamed, on-demand video than broadcast TV on a weekly basis; video will generate half of the mobile data traffic; LTE subscriber growth will exceed 80 percent; and world mobile broadband coverage will be above 70 percent. These are all massive forces of change and open up new opportunities both in the ICT industry and in other industries."

Vestberg continued: "There is a new logic being applied across industries. We can see a definite shift from physical products to digital services. New business models are emerging, along with new ways of solving old problems that create new efficiencies. True customer intimacy can be created using digital tools. All in all, you can see that ICT drives transformation that is really changing the game."

Advancing digital experiences

INNOVATION

Ericsson made nine announcements with the common themes of transformation and advancing digital experiences.

The Ericsson Radio System is a new approach to how to build radio networks on the road to 5G, with the Router 6000 Series integrating IP backhaul into the radio network. Networks Software 15B, the latest release of Ericsson's network wide software, introduces Ericsson Virtual Router, coverage improvements such as simultaneous LTE TDD-FDD operation and a new release of the Ericsson Network Manager along with other features.
Ericsson introduced its App Experience Optimization service claimed to improve 'time-to-content' by up to 70 percent





and upload time by up to 50 percent. Ericsson also launched Digital Telco Transformation — a consulting and systems integration toolbox that "enables operators to become digital in their own operations and customer interaction "— according to Ericsson One part of this toolbox is Expert Analytics 15.0, software that predicts user satisfaction and allows operators to take automated actions to improve Net Promoter Scores.

Ericsson Cloud System

Vestberg also announced new hyperscale capabilities of the Ericsson Cloud System, saying: "Our proposition is about more than realizing a cloud solution. It is about realizing a digital industrialization strategy. The new additions to the Ericsson Cloud System, including Ericsson HDS 8000 (Hyperscale Datacenter System), tackle the challenges with security, governance and automation, which are areas we know are blockers for many companies."

The Ericsson HDS 8000 is claimed to be the first product in the world to include Intel Rack Scale Architecture. Ericsson and Intel have been working together across a number of technology areas, and now the two companies are moving into the data center and delivering new solution building on that relationship.

Ericsson also launched the Connected Traffic Cloud, saying it went beyond connecting cars to connecting the entire traffic system and opening up opportunities to tackle two of the big challenges in society: road safety and traffic management. It is a managed cloud platform that enables the sharing of real-time traffic and road conditions data between connected vehicles and road traffic authorities and also the communication of traffic advisories to drivers.

NOKIA

At a media and analyst briefing on the eve of MWC, Nokia president and CEO, Rajeev Suri, outlined the steps Nokia has taken since the sale of substantially all of its Devices & Services business to transform itself into a company focused on a world of connected people and things.

Nokia outlined its strategy for seizing the opportunities of a programmable world, and rounded off its launch line-up for Mobile World Congress by unveiling its predictive marketing solution, saying it lets operators tap growing amounts of data to offer smarter services, boost revenues and improve customer loyalty.

"We see technology evolving to a point where almost all people and billions and billions of devices - 50 billion or more by 2025 - are connected, where software holds all those connections together, where analytics bring meaning, and where automation brings simplicity and efficiency," Suri said.

"We are inspired by the human possibilities of technology, and we are in a prime position to address its opportunities. We finished 2014 by showing growth across all three of our businesses - Nokia Networks, HERE and Nokia Technologies - and our honed operating model and strong balance sheet give us the wherewithal to make the right investments in innovation," he said.

"It's the perfect springboard for us as we celebrate our 150th year as a company.

We are geared for 2015 and beyond, and moving forward with optimism and a readiness to unlock the extraordinary potential of our technological future."

Blockbusters

Suri also launched Nokia's predictive marketing solution, part of the company's increasing focus on analytics designed to tap the vast amount of data available to mobile network operators and provide a richer picture of mobile service experiences and ways that information can benefit both customers and operators.

The predictive marketing solution leverages the capabilities and knowhow of Nokia Networks' Customer Experience Management and the Mobile Marketing Suite from its mapping and location intelligence business, HERE, bringing a contextual element to data and the opportunity to set up personalized offers for services tailored to individual customer needs.

"Predictive marketing is just a taste of what we can - and will - do as a company," Suri said. "I am proud of the innovation we announced today and in the run-up to Mobile World Congress, and excited about opportunities open to us as we move into 2015 and beyond." Predictive marketing is one of the many opportunities Nokia sees in big data and analytics, and part of the five blockbuster trends the company discussed at Mobile World Congress. Nokia also showed how the telco cloud could help operators keep pace with the Internet world; how ultra-dense networks can ensure performance and meet growing capacity demands and how the latest application of location





information can improve driving safety; and how to connect and manage the Internet of Things.

Programmable World deal with KT

At MWC Suri and KT CEO, Dr Chang-Gyu Hwang, signed a two-year memorandum of understanding (MoU) to establish an Internet of Things (IoT) lab and LTE-M test site at KT premises, supported by all three Nokia businesses: Nokia Networks, HERE and Nokia Technologies. The MoU aims to develop an IoT convergence business model covering IoT Future Convergence Solutions and the automotive industry. IoT provides a path for what Nokia calls the 'Programmable World' and opens up tremendous potential to expand the human possibilities of technology.

In addition, the two companies agreed to collaborate on potential 5G areas including 5G standardization activities and 5G trials during the international winter games in PyeongChang in 2018.

The two companies jointly demonstrated an LTE-M prototype for Machine-to-Machine communication that links together a large number of wearables, cars and smart grid elements, ensures more than 10 years of battery life and provides four times more coverage than conventional LTE. According to Nokia, this pre-5G technology enables the cost-efficient connection of a massive numbers of sensors, even in remote or poor coverage locations. Nokia Networks used its end-to-end LTE system including Flexi Multiradio 10 Base Station and Flexi Zone for the LTE-M demonstration.

OOREDOO

Ooredoo sees significant opportunities for growth across its business-to-business (B2B) customer base in the MENA region and Southeast Asia. It unveiled a strategy to tap the estimated \$10 billion market.

The company already has a strong presence in the B2B market. It generated more than \$1 billion revenue from B2B services in 2014, with nine-month yearon-year growth up 10 percent and B2B customers up 25 percent.

However, with an estimated nine million companies present in its core markets of Algeria, Tunisia, Irag, Kuwait, Qatar, Indonesia, Oman and Myanmar, Ooredoo is looking to build upon its leadership position in the coming years and fully realise its opportunities.

Dr Nasser Marafih, group CEO, Ooredoo, said: "Ooredoo is aiming to make 2015 a year of 'smart solutions' and in particular we are targeting growth in the B2B sector. After significant investment in bigger, faster networks, and the development of key infrastructure such as data centres, Ooredoo is ideally positioned to be the business partner of choice in the Middle East. North Africa and Southeast Asia. We see huge opportunities for growth in smart business services, as companies in our footprint continue to invest in ICT to support their wider ambitions."

1,100 strong business unit

The company has assembled a dedicated team of more than 1.100 business service professionals as part of its Ooredoo Business unit in a move

designed to enhance focus across its primary markets. Ooredoo has also established a Sales Academy where more than 600 sales team members are being trained in best-in-class sales techniques for business services.

This approach seems to be paying off. Ooredoo Business has signed numerous landmark agreements over the past 12 months, including a major deal to provide embedded data solutions with Intel devices in Indonesia and a total Cloud and VPN infrastructure solution of 87 sites for Poulina Holding in Tunisia. In Qatar, Ooredoo recently signed an agreement to build an exclusive global media solution for Al Jazeera. which will connect Al Jazeera's main hubs in Europe, the Middle East, the Americas, Asia and Africa, as well as linking various bureaus around the world.

Ooredoo offers a broad portfolio of solutions, including connectivity, convergence and cloud services, and is applying its expertise to innovative new areas, such as machine-tomachine (M2M) communications.

One of Ooredoo Business' first major launches is a pan-regional cloud-based M2M platform with Ericsson, which enables companies to implement vertical Internet of Things solutions quickly and more easily. Ooredoo says it has adopted a 'build once, deploy many' and 'cloud-first' approach for all of its product management that has enabled it to cut time to market by 75 percent and to radically reduce its costs to deliver these solutions.

Mobile World Congress

The GSMA has provided an update on the 2015 GSMA Mobile World Congress to be held 15-17 July 2015 at the Shanghai New International Expo Centre (SNIEC), detailing additional exhibitors, new meetings and events, an expanded innovation program and a focus on digital health.



ewly confirmed exhibitors include Airwatch, Askey, Far EasTone Telecommunications, MonitorLing, Nokia Networks, Phicomm, Raisecom, Shenzhen Pavilion, Software

Park Thailand and Spectrummax.

Enterprise IoT Summit

A new program, the Enterprise IoT Summit, will bring together CIOs from a range of industry sectors and leaders of technology enablers to discuss the development of the Internet of Things (IoT) and how enterprises can benefit from this rapidly developing technological shift. F5 Networks is the sponsor of the two-day event.

Fashion Show returns

After its debut last year the GSMA 360Fashion & Tech Runway Show will return in 2015. Produced jointly by the GSMA and 360Fashion Network, the Runway Show will "deliver a unique catwalk experience that will showcase the latest devices and innovations and highlight the intersection of technology and high-end fashion."

Pop Forum

Working with Los Angeles-based memBrain LLC, the GSMA will launch

'Pop Forum: Shanghai'. It will "provide a platform for content creators, entertainment companies and marketers, enabling them to connect with leading technology companies and China's highly coveted consumer market in a high-impact environment."

Programming in the Pop Forum exhibitor area will focus on transmedia storytelling, gamification, big data and immersive/ experiential content such as virtual and augmented reality and holograms. memBrain is developing the Pop Forum programme in partnership with entertainment industry veteran Teddy Zee.

Smart Home Summit

The new Smart Home Summit will examine the potential of the burgeoning smart home market, with a particular emphasis on how cloud services, smart life applications and smart home devices will be accessed and managed by households, as well as the communication specifications and standards that will make the smart home a reality. Organised by Digitimes, it will be held on Friday, 17 July.

Entertainment Summit

The GSMA is also launching the Entertainment Unlimited Summit, a program highlighting the convergence of entertainment, the Internet and the mobile industry. It says: "Summit attendees will have the opportunity to hear from industry leaders who are driving the development of entertainment content and partnerships with operators, broadcasters, Internet companies and third-party video and music service providers."

Smart Retail Summit

Another new programme at Mobile World Congress Shanghai, the GSMA Smart Retail Summit, is billed as "a dedicated event featuring provocative ideas, innovative practices and disruptive technologies [that] will bring together senior managers from retailers, brands, smart technology providers and other vertical players to decode the future of smart retail."

Digital health

THE GSMA has formed an agreement with China Connected Health Alliance (CCHA), the branch organisation of European Connected Health Alliance (ECHA), to bring digital health to Mobile World Congress Shanghai. It is designed to foster thought leadership within digital health in China and showcase the next generation of deployable healthcare technologies.

Expanded innovation program

The GSMA is expanding its innovation program to include the Innovation Series, the Baustein Innovation Summit 2015, Startup Alley, Innovation Labs and a range of innovation-focused networking activities. The Baustein Innovation Summit 2015 is billed as "an exclusive, invitation-only event for executives in the mobile industry as well as other sectors and is designed to challenge current assumptions regarding the growth and adoption of corporate innovation and disruption by startups."



meet LoRawAN

5G may be flavor of the month but it's not necessarily the best way to interconnect the billions of devices expected to make up the Internet of Things. At Mobile World Congress a bunch of industry heavyweights were pushing a new technology designed for IoT.

> obile World Congress in Barcelona was dominated by 5G and fancy devices. Every major telco infrastructure

vendor was touting their 5G credentials and there were smart watches, wearables and a multitude of other devices all designed to make use of the communications capabilities of today's cellular network technologies and those yet to come.

Far less prominent, but potentially far reaching, was the official launch of a body promoting a quite different radio communications technology: The LoRa Alliance. It's far too early to assess the importance of the announcement, the prospects for the success of the alliance, or the technology it is promoting, but with a membership list that includes some of the world's biggest names in IT and with a focus on what is being tipped to be a disruptive force even greater than the Internet, the LoRa Alliance deserves to be noticed.

MWC marked the formal launch of the LoRa Alliance following its unveiling to journalists at the Consumer Electronics Show in Las Vegas in January. According to its web site, the alliance was "initiated by industry leaders with a mission to standardize low power wide area networks (LPWAN) being deployed around the world to enable Internet of Things (IoT), machine-to-machine (M2M), and smart city, and industrial applications."

The Alliance says it members "will collaborate to drive the global success of the LoRa protocol (LoRaWAN), by sharing knowledge and experience to guarantee interoperability between operators in one open global standard."

Heavweights backing LoRa

Neither the web site nor the press release announcing its formalization at MWC give any clue as to the make up of the alliance. However when it debuted at CES, the alliance issued a press release saying: "The prospective initial alliance members include leading IoT solution providers: Actility, Cisco, Eolane, IBM, Kerlink, IMST, MultiTech, Sagemcom, Semtech, and Microchip Technology, as well as lead telecom operators: Bouygues Telecom, KPN, SingTel, Proximus, Swisscom, and FastNet (part of Telkom South Africa)."

According to the web site, the technology being developed and promoted by the alliance, LoRaWAN, is a low power wide area network (LPWAN) specification intended for wireless battery operated things in regional, national or global networks. It aims to fulfill key requirements of Internet of Things such as secure bidirectional communication, mobility and localization services.

"This standard will provide seamless interoperability among smart things without the need of complex local installations and gives back the freedom to the user, developer, businesses enabling the roll out of Internet of Things," the alliance claims.

LoRaWAN network architecture is typically laid out in a star-of-stars topology in which each gateway is a transparent bridge relaying messages between end-devices and a central network server in the backend. Gateways are connected to the network server via standard IP connections while end-devices use single-hop wireless communication to one or many gateways. All endpoint communication is generally bidirectional, but also supports operation such as multicast enabling software

Long Range Internet of Things (LoRa™)



upgrade over the air or other mass distribution messages to reduce the on air communication time.

There are several layers of encryption: a unique network key (EUI64) that ensure security at the network level and a unique application key (EUI64) ensure end-to-end security at the application level and a device specific key (EUI128).

LoRa based on spread spectrum

Key to LoRa radio technology is the use of spread spectrum techniques for optimum noise immunity, allowing it to operate at sub-noise-level signal levels.

LoRaWAN appears to be progressing rapidly. Microchip Technology announced at MWC its RN2483 module, describing it as the first in a series of modules compatible with LoRa.

"The modules enable the widespread seeding of millions of wireless nodes, connected via gateways, and operating in the 433/868-MHz band with a range of more than 10 miles (16kms) and a battery life of greater than 10 years," Microchip said.

Then in March, IBM unveiled its LoRaWAN technology saying it was already being deployed. "Senet, a network as a service (NaaS) M2M operator based in New Hampshire [USA], is currently installing 20,000 Semtech LoRa sensors with IBM's LRSC software to track the fuel levels of propane and oil tanks located at residences and businesses on the west and east coasts of the United States."

IBM claims that LoRaWAN sensors can communicate over distances of more than 100km in favourable environments, 15km in typical semirural environments and more than 2km in dense urban environments at data rates from 300bps up to 100kbps. "This makes them well suited for sending small amounts of data, such as GPS coordinates and climate readings, where broadband can't reach," IBM says.

Dr Thorsten Kramp, master inventor, IBM Research, said: "To encourage the mass adoption of low cost, long range machine-to-machine connectivity, open ecosystems are critical. In addition to IBM's support of the LoRa Alliance, we have also released the IBM 'LoRaWAN in C' as open source under the Eclipse public license, which provides a solid foundation for the development of a broad range of end devices compliant with the LoRaWAN specifications."

LRSC (Long Range Signaling and Control) is the IBM middleware that, IBM says, enables users of a LoRaWAN



network to connect, manage and scale to millions of devices. Completing IBM's offering is the IBM Internet of Things Foundation cloud hosted service, billed as "A fully managed, cloud-hosted service that is designed to simplify and derive the value from IoT devices."

IBM says: "When combined with the IBM Bluemix platform, IoT Foundation provides simple, but powerful application access to IoT devices and data. You can rapidly compose analytics applications, visualization dashboards, and mobile IoT apps."

LoRa networks going live

The LoRa technology originated with chip manufacturer Semtech and the alliance has its origins in a move by Semtech in November 2014 when it announced that it was partnering with IBM Research, Microchip and their distribution partners to demonstrate LoRa at the Electronica 2014 show in Munich by deploying a live LoRa network over much of the Munich area. It also gave away 1,000 LoRa IoT demonstration end-nodes to clients of the ecosystem participants so that potential customers could evaluate the range, coverage and potential of the LoRa technology on the demonstration network.

"To take full advantage of LoRa properties Semtech designed the gateway chip set and partnered with IBM Research, Actility and Microchip to develop the LoRaMAC protocol to enable a long-range star network architecture with significantly higher network capacity than competing solutions," Semtech said.

Semtech also announced, in November, that FastNet, a M2M operator in South Africa, and part of the Telkom SA Group, had selected LoRa technology to target low power connectivity for IoT applications.

John Myers, CEO of FastNet, said: "We believe that Semtech's LoRa RF technology is the most appropriate choice to deploy IoT services thanks to its long range and secure, bidirectional communication capabilities. LoRa satisfies the requirements of our customers for smart grid, industrial automation, asset tracking, metering, security and many other applications. The value proposition of the LoRa technology is convincing major industries to deploy IoT applications and services that were previously unrealizable."

LoRa's credentials are impressive, as is the list of its backers, but it is not alone

in its bid to become the glue connecting what are expected to be billions of IoT devices.

LoRa facing plenty of competition

French company Sigfox claims to be "the first and only company providing global cellular connectivity for the Internet of Things, fully dedicated to low-throughput communications," and to be "re-inventing connectivity by radically lowering prices and energy consumption for connected devices."

Today the Sigfox network covers France, Spain, the Netherlands and 10 of the UK's larger cities. However it could soon become much bigger. Sigfox has just raised \$115 million from seven heavyweight investors: Air Liquide, Eutelsat, NTT Docomo, SK Telecom, and Telefónica. It intends to use the money to finance rollout in the United States, Latin America, Japan and South Korea, and aims to roll out its network in 60 countries in the next five years.

It's early days for IoT and for these low power wide area networks and there are other players as well but the stakes are huge. According to IoT market researcher, Machina Research, there will be over three billion LPWA connected devices worldwide by 2023.

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The challenge for service providers is that their relatively static optical networks are not well suited to these traffic patterns. Networks are typically managed with manual operations, are slow to respond and have a high cost of operation. Because of this inflexibility they must be over-provisioned to deal with worst-case scenarios and that results in resources being underused.

To extend network virtualization into the optical layer Pacnet has deployed Infinera's new Open Transport Switch (OTS) software within its softwaredefined networking (SDN) platform, Pacnet Enabled Network (PEN), across its trans-Pacific and intra-Asia submarine networks. Pacnet's existing intelligent transport network is based on the Infinera DTN-X packet optical transport networking platform.

PEN delivers scalable bandwidth and software-enabled intelligence, allowing customers to dynamically provision bandwidth in minutes based on their business needs through a custom portal. PEN is a SDN-based service delivery platform that has successfully offered Layer 2 ethernet services on-demand from 1Mbps to 10Gbps.

PEN offers customers access to Pacnet's network of data centers and major carriers, creating a virtualized, cross-connected Asia-Pacific ecosystem. It also has the capability to extend enterpriseclass data centers and private clouds to external cloud vendors with its OpenFlow-based software controller, offering customers the flexibility to instantly provision cloud compatible networks throughout the region.

Optical bandwidth on demand

Today the combined power of the OTS software and the DTN-X platform allows PEN to offer a Layer 1 transport bandwidth ondemand service in increments of N x 10Gbps. It has been designed to allow services in increments of N x 100Gbps in the future.

Paenet's makes optical network software defined

Pacnet has extended the capabilities of the software defined Pacnet Enabled Network (PEN) to the optical layer, enabling users to 'dial up' multigigabit optical channels on its international submarine cable network.



ith the rise of cloud services and the proliferation of data centers to support these services we are seeing WAN traffic increasing and becoming more dynamic. We are seeing a dramatic rise and spikiness in eastwest traffic or server-server traffic. We are also seeing a continued rise and more dynamic patterns in North South traffic, which is data center-to-user traffic. This ability to allow users to allocate optical transport network bandwidth on demand helps Pacnet offer a more competitive service, generate new revenues, tap into underutilized resources, increase customer retention all while lowering operational costs.

According to Michael Howard. principal analyst, carrier networks at IHS-Infonetics Research, this new service offering highlights how Pacnet continues to lead through innovation, particularly in the area of software-defined network services. "While many providers have been doing SDN lab evaluations or performing SDN proof of concept tests, Pacnet today is delivering the first large-scale, commercially available Transport SDN-enabled service, and it is based on the Infinera Open Transport Switch," Howard said.

Through the PEN web-based GUI or Pacnet Connect, customers can provision network services between two locations in minutes without going through the traditional, long lead time, manual provisioning process. PEN also enables customers to build network interconnects with bandwidth and performance characteristics tailored to their unique business requirements.

"The launch of PEN enables customers to build the highperformance and cloud-ready networks needed to overcome networking challenges prompted by the growth of cloud computing," said Fagan. "With PEN, Pacnet brings cloud provisioning to the network, empowering on-demand, scalable bandwidth provisioning based on customers' unique performance and QoS requirements."

Speeding deployment with DevOps

Leveraging a DevOps model, Pacnet was able to integrate the Infinera OTS together with the PEN platform and deploy the new service in a matter of a few months – in an industry where new service creation and introduction is known to typically take 12 to 24 months. Pacnet has also deployed the Infinera OTS into its existing DTN-X production network by running in hybrid control mode, with new services leveraging bandwidth under SDN control, while existing production services continue to operate using their Infinera DNA network management system.

Also, Pacnet has integrated its OSS/ BSS into the SDN control layer. It says that, for any true commercial deployment this top to bottom integration, all the way to the billing system, is critical.

According to Infinera, its OTS was designed from the ground up with an IT mindset, is constructed with a lightweight and open web 2.0 architecture and can rapidly integrate new features supporting service providers who are transforming to a DevOps model. The Infinera OTS software abstracts and virtualizes the underlying multilayer Intelligent Transport Network taking advantage of the highly scalable and software controllable DTN-X platform.

OTS then presents modern, open application programming interfaces (APIs) to enable simple programming of the transport network by any SDN controller or orchestration system. Alternate solutions in the market often require the deployment of heavyweight network management software (NMS) and a vendorsupplied controller to support SDN deployments, resulting in the possibility of slower feature velocity and vendor lock-in.

The Open Transport Switch is designed to run on a standard x86 Linux server. It can be plugged into any SDN control layer thus it adheres to the SDN principle of separating software control from forwarding.

According to Infinera, OTS has been refined directly with service providers and has now reached prime time, providing network operators with a simple, lightweight, Web 2.0 API to configure, provision, monitor and control the intelligent optical network, without the burden of an underlying element management system.

Optical switch optimised for integration

Unlike other solutions that layer SDN APIs over existing management platforms and create interdependency with legacy software, or solutions that depend on specific SDN controller technologies, OTS is designed and optimized for easy integration with any network operator's SDN controller environments.

This independence from both management solutions and SDN controller frameworks gives operators the flexibility to not only choose the platform that is best suited for their needs, but also facilitates rapid integration and DevOps engineering practices.

OTS is also designed to help facilitate the introduction of transport SDN into the network independent of a network operator's production services. Through resource partitioning capabilities and direct integration with the network infrastructure, OTS enables coexistence with network operations and network management solutions, but without any interdependencies, allowing each to individually evolve as needed over time.

Said Stu Elby, senior vice president, cloud network strategy and technology at Infinera:, "The production deployment of the Infinera Open Transport Switch to support Pacnet's innovative new service demonstrates how an open networking approach, combined with a DevOps model, reduced time to market for new services.

He concluded: "We believe the availability of the Infinera Open Transport Switch makes the Infinera Intelligent Transport Network the most programmable optical networking solution available, enabling our customers to rapidly develop new services with the SDN controller of their choice."

In the IoT era even the furniture will be smart

With everything expected to be embedded with sensors and connected to the Internet it should be no surprise the even furniture will be smart, and SK Telecom has taken the lead with the world's first Smart Furniture.

n 1989 the blockbuster movie franchise 'Back to the Future gave us a moviemakers' vision of what life might be like in 2015. It presented a range of gadgets that included Nike's self-lacing shoes, quick-drying jackets, flying cars and the infamous floating skateboard – the Hoverboard that enthralled moviegoers worldwide. Futuristic appliances and furniture to enhance the family life of the central character, Marty McFly, also featured prominently. There was the self-adjusting laundry or clothesline, multiscreen TVs that allowed you to watch two movies simultaneously while making a phone call. And there was the Black and Decker Hydrator that looked like a Microwave oven but did much more than just reheat and cook food. Twenty five years later most of these futuristic gadgets are yet to materialise. Meanwhile there have been plenty of developments that Back to the Future missed: smartphones and the Internet, for example. And smart furniture - the latest innovation from the ever innovative South Koreans. The new smart home furniture powered by Internet of Things technology is the product of a ten month long collaboration of large players in the industry, spearheaded by South Korea's largest mobile carrier, SK Telecom and South Korean furniture maker, Hyundai Livart.

More than just a lump of wood

Hyundai Livart's role was to design furniture with network connectivity

and touch screens while SK Telecom developed a new service platform for the smart furniture. Users can now use the new smart furniture pieces to browse the Internet, listen to the radio, and search for news or recipes, food prices and the weather, and make and receive calls. In addition, according SK Telecom, users can also link doorbells to monitor visitors, open doors and control room temperature from the screens provided.

SK Telecom said it was the first company in the world to create smart furniture and that development of the furniture was in line with the company's goal in providing a better smart home services amid the Internet of Things.

For example users of the kitchen shelf are able to make and receive calls from their furniture by linking their handsets via Bluetooth. Smart Furniture can also be linked to doorbells to monitor visitors, open doors and control the heating and cooling systems in the household. Future applications for the technology are enormous and could include fitness, security and even child safety in homes.

Other devices are even more intelligent, and proactive. Everycook is a sensor-based, Internet-enabled kitchen device that takes in fresh, raw ingredients and produces a finished meal. And there is CastleOS, a home-based personal assistant that opens doors, controls lights, sets room temperatures and even adjusts bed positions while you sleep. The device can be controlled from a smartphone, tablet and by voice command.

"Mirror, mirror on the wall, you're the smartest of them all."

Another example would be a dressing table that allows you to simultaneously fix yourself in the mirror and at the same time browse the latest news and personal schedule. Sensors are embedded in the mirrors, which are also touch screens. And it is bluetooth-enabled,



so receiving and making a call or listening to music via smartphone is also possible.

It is understood that Hyundai has provide several construction companies in South Korea with Smart Furniture for it to be showcased and offered to consumers. Hyundai also plans to launch an additional 10 smart furniture products in 2015. The company has said it expects its smart furniture business to contribute \$46 million to Hyundai Group revenues in 2017.

SK Telecom said that the development of other kinds of furniture, including smart beds and sofas was also underway and that these items were expected to be commercially available within this year.

Meanwhile global furniture colossus, Ikea, debuted its line of smart furniture at Mobile World Congress in Barcelona. The range includes bedside tables, standing lamps and end tables but these items are only moderately smart: they include built-in wireless charging for mobile devices. They are due to go on sale in April.

Early days for smart furniture

The concept of smart furniture is very new and the term has yet to enter the lexicon of IT: there is no entry for smart furniture on Wikipedia. Any references that might be thrown up by a Google search are buried in the half million or so hits that reference traditional furniture that merely purports to be smart in the sense of attractive, or fashionable.

However all the predictions are for billions of connected devices by 2020. According to analysts from IoT Perspectives, an online magazine that covers and analyzes the business, markets and technologies of the Internet of Things 2015 will be the year when the 'Grand Convergence' of microprocessors, connectivity, sensors, cloud and design ecosystems turn into the 'Grand IoT Market Opportunity', when smart homes, smart cities, smart farming, smart retail, smart health, smart cars, smart factories, smart toys, smart games and smart wearables will become a reality.

Smart furniture will be no exception. SK Telecom may be the first but it certainly won't be the last. Just think how much a smart bed could tell you about your sleep patterns, and perhaps even gently rock you to sleep!.



Vietnam has made significant changes to both fixed line and mobile numbers. The move has, not surprisingly, met with opposition, but it has brought a greater degree of uniformity and, the Government says, will pave the way for future growth.

> he GSM Association recently released a report entitled Mobile Economy -Asia Pacific 2014 in which it concluded that Asia's mobile

economy was on an upward trend and a force to be reckoned with in terms of the number of unique subscribers and the number of connections. For the next few years Asia is expected to remain the second fastest growing region in terms of subscribers and connections, adding more than 750 million new subscribers up to 2020.

The GSMA report highlighted Vietnam's achievements. The country ranks seventh amongst Asia Pacific countries by the number of unique subscribers, 55.2 million, and has 123.7 million total mobile connections. Along with Thailand, Malaysia and Indonesia it forms what GSMA calls the Fast Grower segment. Countries in this segment have a mobile penetration level of at least 45 percent, the global average, and penetration in these countries is expected to reach 60 percent by 2020.

Last year research company Informa also identified Vietnam is one of the new entrants to the 100 million connection club, along with Bangladesh, Philippines and Mexico.

Meanwhile Vietnam has been developing its telecom infrastructure, increasing its capacity and coverage and upgrading networks to 4G. It has also addressed one of the most pressing needs: creating uniformity of mobile and landline numbers across the country. According to Vietnam's Ministry of Information and Communications, the number of landline and mobile phone connections, combined, is about 130 million. Landline phones account for about 5.4 percent or close to seven million, mobile connections 94.6 percent or more than 120 million.

In December last year the Ministry issued a guideline (Circular No 22/2014/TT-BTTTT) specifying that the area codes for land lines and the prefixes for mobile numbers would both change.

61 provinces get new prefixes

Under the current fixed line numbering scheme Hanoi and Ho Chi Minh City have single digit areas codes, two-digit area codes are used in 37 provinces and three digit area codes in the remaining 24 provinces. Under the new scheme Hanoi and Ho Chi Minh City with have two digit area codes, 24 and 28 respectively, while the other 61 provinces get three-digit codes. The codes for four northern provinces that already have three digit codes - Ha Giang, Vinh Phuc, Phu Tho and Hoa Binh - will remain unchanged.

Currently, mobile phones have both two and three-digit prefixes and 11 digits in total. All 11-digit numbers with prefixes '012' of VinaPhone and MobiFone, '016' of Viettel, '018' of Vietnamobile and '019' of GMobile will be converted into 10-digit ones. The change is expected to affect about fifty percent of country's mobile subscribers.

This is good news for the country's roughly 40 million 11-digit subscribers, as most Vietnamese people suspect 11-digit numbers of being spammers. In Viet Nam, spammers favor 11-digit mobile phone numbers because they are much cheaper than 10-digit ones.

The new numbers - both fixed and mobile - became operational in March 2015. However the old numbers will remain operational for the next two years, to provide time for businesses to upgrade stationary, signage etc, to reflect the changes.



The majority of customers impacted by the landline changes are business owners because they account for the majority of landline users. Most households rely only on mobile phones.

Business owners have reacted negatively to the move, seeing it as an additional cost of doing business, because stationary, business cards and more will have to be replaced.

The Ministry justified the change by claiming that the old numbering scheme was not able to handle Vietnam's rapidly expanding communications systems, and pointing out that the changes would standardize the length of phone numbers nationwide.

Operators caught by surprise

The MIC said that all affected users would receive notification via media and other types of communication 60 days before the changes were implemented. They said also that they were working closely with telecommunication companies to ensure a smooth transition to the new system.

However, the announcement of the new scheme caught telecom operators in Vietnam by surprise, but they promised to work with the government to implement it. Bui Quoc Viet, spokesman for Vietnam Posts and Telecommunications Group, said he was notified about the planned changes only a week prior to their announcement. Do Minh Phuong, director of Viettel Telecom, said he had received notification only in the week that the plan was announced.

Change is inevitable and these changes are necessary to accommodate the ballooning numbers of subscribers. Like all change it has been greeted with opposition. However it is timely and the government is committed to it. SURF

Philippines contemplates cellphone kill switch

Costly and ubiquitous, smartphones are easy and tempting targets for Manila's criminal community. Technology offers a simple way to make them less attractive, but the country is being slow to adopt it.

C

laro M Recto is a well-known Philippine political figure who has given his name to a notorious street in Metro Manila's university belt. The

many students traversing the street keep tight hold on their bags and belongings for they know all too well that dangers that lurk there. Recto is in the top five areas in Manila for street robberies and theft. According to the National Capital Region Police Office (NCRPO) there are approximately eight incidents of robbery and theft on Recto and neighbouring streets every day. Furthermore some hundred high schools, colleges and universities near Metro Manila are considered crime hotspots. The robbers' main targets are students' mobile phones, tablets and their other expensive gadgets.

A stone's throw away from Recto is Rizal Avenue, more commonly known as Avenida. The network of alleys around Rizal Avenue is filled with street peddlers selling secondhand mobile phones, known in the local parlance as GSM or Galing Sa Magnanakaw (From thieves and robbers).

A healthy market for hot smartphones

Onlookers enjoy examining the wide range of models from Samsung, Huawei, HTC and Apple. For the peddlers, converting the onlookers' curiosity into cash is the key. Endless haggling occurs until they amicably surrender these phones to their new owners.

This is why the business of stealing mobile phones thrives in the streets of Manila. Demand for these devices is always high and thieves find it very lucrative to be on the supply side. To address the problem of rampant mobile phone theft, the Government is considering mandating that telecom providers and device manufacturers install a kill switch feature on smartphones.

A kill switch is a mobile app that enables the owner of a stolen phone to freeze their lost device and wipe its contents from a remote location. The only way to revive a locked smartphone is with a use of passwords supplied by the owner. The stolen phone is thus rendered useless and of no value.

For the past year, kill switches have been making headlines as a means of curbing mobile theft in the United States, the UK and in some Asian countries.

The US National Consumers League reported that handheld devices were stolen from 1.6 million Americans in 2012, about half of them from major cities. But in June 2013 several major cities formed the Secure Our Smartphones (SOS) Initiative, a partnership of law-enforcement agencies, elected officials and consumer advocates aimed at tackling smartphone theft.

The SOS Initiative is led by New York State attorney general, Eric Schneiderman, and San Francisco district attorney, George Gascón. They were joined in late 2013 by London mayor, Boris Johnson.

US experience show the benefits

The SOS Initiative has called on the smartphone industry to adopt the kill switch technology as a theft deterrent. It has highlighted the effectiveness of the strategy by releasing crime data and has been putting pressure on private industry to implement the technology.

According to recent reports, since a kill switch feature was added to the iPhone in September 2013 — it was introduced with iOS 7 and is known as Activation Lock iPhone theft has dropped by 40 percent in San Francisco and by 25 percent in New York over the past 12 months. In the UK, in London, smartphone theft has halved. California lawmakers have now passed legislation that makes a kill switch mandatory on all new phones sold. It will take effect in July 2015. Meanwhile, in Asia, South Korea has been a leading proponent of the smartphone kill switch. It has been mandatory since February 2013. The South Korean Ministry of Science, ICT and Future Planning has introduced an act forcing local manufacturers like Samsung, LG and Pantech to incorporate one in all new smartphones.

Pantech has been incorporating the function since February 2013, but Samsung and LG has to alter their manufacturing process to incorporate it. The Samsung Galaxy Note 3 was the first product to have the kill switch and was introduced in September 2013. The first LG smartphone to ship with a kill switch was the LG G3, launched last May 2014.

A kill switch is built into the Samsung Galaxy S5, which made its debut April 2014 and since then, all smartphones released by Samsung in South Korea have shipped with the de-activate function.

Widespread support

In the Philippines there is widespread support for a mandatory kill switch across government and industry. In fact, it was Department of Justice Secretary, Leila de Lima, who brought it to the attention of the public and who has since urged telecom companies to install one on their smartphones. She cited US and UK experience to demonstrate that it can help curb theft. She also points out that it can be introduced without the need of any further legislation.

Philippine Long Distance Telephone Company (PLDT) spokesperson Mon Isberto said the company had analyzed the proposal and was studying the software to be used. He added that it was also vital to engage the manufacturers of locally branded devices.

Globe Telecom senior vice president for corporate communications, Ma Yolando Crisanto, said the kill switch was primarily the responsibility of device manufacturers and not of the telecom providers. However, if the requirement were imposed on telcos, this would create an additional level of security.

Both PLDT and Globe can disable mobile connectivity through the phone's



(IMEI) number once it has been reported stolen. However, this is not a foolproof solution because the phone will work once switched to other telco, and data on the phone remains accessible.

In Australia it has been possible since 2003 to report the IMEI of a stolen phone and have it immediately blocked across all Australian mobile networks. (In the pre-smartphone era, phones were not sufficiently smart to be remotely locked.) The systems used to support this function is the same as that used to enable numbers to be rapidly ported from one network to another.

Legislation proposed

Although De Lima insisted that no legislation is needed to implement a kill switch such legislation is being proposed. House Bill 4511, authored by AMA party member Rep Lorna Velasco, and House Resolution No 93, introduced by Bicol party representatives Christopher Co and Joel Batocabe at the Congress, are both seeking to require all network service providers to install the software on mobile phones.

The experience of the US, UK and South Korea shows how effective kill switches can be in curbing smartphone theft, but their experience also shows that responsibility does not lie solely with mobile service providers. In these countries there has been collaboration between telecom operators, device manufacturers and national and local government agencies.

Until the Philippines learns from their experience and adopts similar measures smartphone theft will continue and markets in Rizal Avenue and elsewhere will continue to thrive.

5G PPP sets out 5G vision



5G PPP, the 5G public-private partnership between the European Commission and European industry and research community launched at Mobile World Congress in Barcelona its inaugural vision paper "outlining how 5G will create a single digital economy, and put Europe back in the driving seat with a ubiquitous network that will connect people, things and services based on a plethora of innovation unseen before at such scale."

According to 5G PPP, "European society and economic performance will strongly rely on 5G infrastructure in the years beyond 2020. 5G is more than an evolution of mobile broadband technology. It is an enabler for a truly digital society with ubiquitous, ultra-high-speed communications infrastructure that will support all economic sectors as well as evergrowing consumer demand for new services. 5G is also an opportunity for the European ICT sector, which is already well positioned in the global R&D race and contributes about five percent to Europe's GDP, to expand its leadership position globally."

The paper details:

- the 5G PPP vision for next generation communication networks and services;

- a comprehensive roadmap towards 5G deployment in 2020 and beyond;

- how 5G will enable and support new businesses and services;

- the key use case scenarios that 5G will need to support;

- consensus among 5G PPP members on the role that a wide range of existing and future technologies will play in 5G as well as initial design principles for the system;
- topics related to 5G spectrum that need further research.

NTT Docomo, China Mobile and KT collaborate for 5G R&D



NTT Docomo, China Mobile and KT are to conduct a three-way 5G technical collaboration following an agreement reached at Mobile World Congress in Barcelona. The three said in a joint statement that they would team up to "accelerate 5G commercial deployments and drive standardization efforts, as well as facilitate discussions with diverse mobile technology companies and research institutions."

They have also extended an invitation to others saying: "Global cooperation is the foundation for the success of 5G. Consequently we are willing to cooperate with other global industry organizations, operators, manufacturers, universities, and research institutes to build a healthy and sustainable 5G ecosystem." CMCC, DOCOMO and KT said they would extend their close collaboration from 4G to 5G activities to:

- elaborate and integrate 5G

requirements, particularly in the Asian market;

- explore the new service and vertical market of 5G;

- jointly identify 5G key technologies and prove the validity of system concepts; - collaborate with global organizations (eg ITU, 3GPP, GSMA, NGMN, GTI) to achieve the global harmonized spectrum planning and a unified global 5G standard

OpenDaylight hosts first SDN forum in India



The OpenDaylight Project, a community-led and industrysupported open source platform to advance software-defined networking (SDN) and network functions virtualization (NFV), is hosting its first OpenDaylight Forum in India - in Bengaluru on April 22-23, 2015 - to fuel collaboration between the networking industry, users and open source communities on the OpenDaylight SDN platform.

The OpenDaylight community is developing a common, open SDN framework consisting of code and blueprints. It says the two-day forum will be for beginners to advanced veterans and will include technical presentations on the latest version of OpenDaylight, dubbed Helium, as well as ongoing design and development topics around the release under construction, dubbed Lithium. "The event is also an opportunity to engage and network with the users and open source communities for cross-pollination of ideas and technologies," it said.

Neela Jacques, executive director, OpenDaylight, said: "Delivering an industry-wide platform for softwaredefined networks is not something any one company can do alone. It requires collaboration on a mass scale. What we need are open source communities collaborating with users and suppliers to tackle the networking infrastructure issues we all face. Our community is eager to collaborate with and learn from the organizations in India so we can resolve this together."

Broadband Forum progresses SDN & NFV standards



The Broadband Forum says its annual meeting in Shenzhen, sponsored by Huawei Technologies, took a number of initiatives "to bring practical deployment of virtualized solutions to the broadband network."

Broadband Forum CEO, Robin Mersh, said: "There have been a staggering

1000+ technical contributions over our last year reflecting new market requirements and profound changes in service delivery."

According to the Broadband Forum, the new work is being delivered in the form of a series of standards (technical and marketing reports) covering SDN and NFV and programmability in the multiservice broadband network, FTTdp management, fixed access network sharing, hybrid access for broadband networks and TR-069 development. The meeting elected Michael Fargano (CenturyLink) as Technical Committee chair "to spearhead the development of innovative technical standards required for software defined virtualized networking" and appointed William Lupton (contracted with Honu) as software architect to lead the Software Group to create future document structures for the Forum's NFV and SDN activities. Mark Fishburn (contracted with MarketWord) is working with the Forum on strategic marketing, positioning and messaging.

Telcos, OEMs and SIM vendors team for interoperable eSIM



A group of global operators, OEMs and SIM vendors has announced that its members are jointly working towards the implementation of a truly interoperable approach to eSIM (enhanced SIM) that will benefit consumers by enabling them to freely choose different devices and different operators. The group comprises América Móvil, Ooredoo, Telefónica, China Unicom, Huawei, LG, Samsung, Sony Mobile, Gemalto, Giesecke & Devrient, Morpho, Oberthur Technologies, STMicroelectronics and Valid. Since September 2014.

"The group has been deeply involved in creating a technical definition, which guarantees the interoperability of the eSIM-powered devices with any operator, SIM vendor, and any platform provider," they said in a statement.

On 5 February 2015 the group released its first technical definition of an

operator Interoperable Profile Package (IPP) to GSMA and SIM Alliance members "to allow any industry player to take part in this initiative in an open and transparent manner."

"This definition of an operator profile package enables an interoperable deployment of eSIM for everyone, fosters the innovation and the development of value added services on top of the SIM matching GSMA business principles and enabling the use of existing infrastructures and network equipment to ease the adoption of current scenarios," the group said.

Pacnet offers regional software defined optical network with NFV

PACNET

Regional cable network and data center operator Pacnet, has extended its Pacnet Enabled Network (PEN) software defined network service - that enables customer to 'dial up' international bandwidth on demand - into the optical layer. Customers with a presence in Pacnet data centers can now set up optical links at 10, 40 or 100Gbps by the hour, the day, or the week via a web portal. The service also supports network functions virtualization enabling customers to add virtualized routers, firewalls etc to their networks

Pacnet's enhanced PEN platform also delivers automated connectivity to external private and public cloud providers. "Customers can easily create their hybrid cloud deployment via an intuitive drag-and-drop function on the platform with greater control and flexibility when provisioning between their data center or network," Pacnet says.

Said Jim Fagan, president of managed services at Pacnet; "The journey from

launching PEN 16 months ago to enhancing its capabilities with NFV and extending the service to the optical layer marks a significant milestone for the company and the industry. We committed to our customers that we would build an automated network platform that can be tailored to their specific needs and we are keeping that promise."

Fagan said that Pacnet had worked closely with key technology vendors principally Infinera and Ciena to develop the service. It relies on the recent upgrade of the Pacnet network to 100Gbps per wavelength using Infinera technology.

TNT chooses Verizon for global network upgrade



Australian company TNT — which claims to b one of the world's largest express delivery companies — has chosen Verizon Enterprise Solutions to roll out a global communications network. Verizon will provide global network, telephony and conferencing services and security technology and services linking TNT's 3,000plus hubs and depots worldwide and serving TNT's 58,000 employees.

According to Verizon, "In 2014, TNT launched a strategy, called Outlook, to drive profitable growth, achieve operational excellence and 'organize to win' [in which] simplifying and transforming IT is particularly important in helping TNT to deliver a perfect transaction to customers, from order, through tracking, to delivery of their consignments.

"Unified communications and collaboration solutions, including video, audio and net conferencing, will enable TNT to facilitate communications while also improving productivity. Most importantly, with the Verizon team taking responsibility for all network management and operational needs, TNT's internal team is able to focus all its efforts on supporting the company's strategic goals."

SK Telecom and Saudi Telecom team for innovation



Telstra has launched Global Media Switch, a professional video delivery platform that allows broadcasters and content creators to schedule, manage and distribute video in real-time across the world. It says the move is designed to accommodate evolving broadcast needs in today's fast paced media environment.

Global Media Switch is billed as "A highly resilient, IP-based delivery network [that] provides customers with codec-level connectivity directly from the originating content source all the way to the broadcast destination."

Jim Clarke, director of marketing, products and pricing in Telstra Global Enterprise & Services, said Global Media Switch would offer greater control over media assets and 'Codecs as a Service' through a zero-capex pricing model so as to accommodate the significant transformation that the media landscape is experiencing.

"With new models of on-demand consumption and audience fragmentation, media companies have had to make some substantial changes to the way they acquire, distribute and manage media assets," he said.

"With the Global Media Switch web portal, video contributors can take direct control of service booking, scheduling and delivery to broadcasters themselves in a cost effective way, and even advertise content to other media providers to further maximize revenues."

Nokia and KT sign agreement to progress IoT

NOKIA Kt

Nokia and KT have signed a twoyear memorandum of understanding to establish an IoT lab and LTE-M test site at KT premises, supported by all three Nokia businesses: Nokia Networks, HERE and Nokia Technologies. The MoU commits the two to the development of an IoT convergence business model covering IoT future convergence solutions and the automotive industry. The two companies have also agreed to collaborate on potential 5G areas including 5G standardization activities and 5G trials during the international winter games in Pyeongchang in 2018.

At MWC the two companies jointly demonstrated an LTE-M prototype for M2Me communication that linked together a large number of wearables, cars and smart grid elements and that they said "ensures more than 10 years of battery life and provides four times more coverage than conventional LTE [and] enables the cost-efficient connection of a massive numbers of sensors, even in remote or poor coverage locations."

Nokia CEO, Rajeev Suri, said: "Through our collaboration with KT, we aim to provide new solutions for what we call the 'Programmable World' that will expand our possibilities as the things around us such as cars and watches will be connected and therefore able to automatically inform us, adapt to our behavior or business processes, learn and organize themselves." Lenovo re-unites Asia-Pacific business units under Lappin



Lenovo has appointed Roderick Lappin as president Asia-Pacific region, effective April 1. The company said his appointment signalled a reuniting of its Asia-Pacific emerging markets and Asia-Pacific mature markets businesses into a single unit. As part of this initiative, Lenovo is also promoting Ken Wong to vice president of strategy and planning.

Lappin has been with Lenovo for the past eight years and has been based in Japan since 2008. He will remain there maintaining his current role as president of NEC Lenovo Japan Group and will continue to lead the Japan and ANZ businesses, reporting to Gianfranco Lanci, Lenovo's chief operating officer and executive senior vice president.

Tenable Network Security expands into Asia Pacific



Network monitoring specialist, Tenable Network Security, has appointed Gary Jackson vice president of sales for Asia Pacific. The company is aiming to be "a category leader in cybersecurity" and says it is expanding in APAC to meet demand for its SecurityCenter Continuous View network monitoring technology. Jackson has a 40 year career in technology sales, including stints at Microsoft and Sybase. Prior to joining Tenable he held APAC vice president positions with Cisco Systems, EMC and Aruba Networks.

Subscription biller Vindicia expands into Asia Pacific



Subscription billing technology provider Vindicia has opened an office in Singapore and has appointed Michael Greco to head it as Asia vice president. He said the opening of the Singapore office was the start of a long-term strategic plan for the region. "Vindicia is already managing tens of millions of dollars in local subscription revenue, a figure set to explode given the mounting popularity of digital OTT services in APAC" Greco said. "The new office will also allow Vindicia to work more closely with existing regional clients, such as Telstra, Media Prima and Motley Fool Australia."

Hootsuite gets VP for Asia Pacific



Hootsuite, which claims to be the world's most widely used social relationship platform, has named Simon Trilsbach as vice president, Asia Pacific. Prior to joining Hootsuite, he was vice president, Asia Pacific at Social Bakers, a global social media analytics and optimization company. He also has been general manager to Southeast Asia, Hong Kong and Taiwan at Experian Marketing Services. Cloudera names Richard Jones to head Asia Pacific



Cloudera, a provider of enterprise analytic data management software based on Apache Hadoop, has named Richard Jones vice president of ANZ/ ASEAN (Australia, India, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam and New Zealand). He will lead a team of sales and technical support staff, expand Cloudera's South Asia presence and "pursue innovative new ways to use and apply Cloudera technology." He was most recently vice president of sales and operations Asia Pacific and Japan for Informatica and before that an independent consultant.

NetSuite expands Asia Pacific presence



NetSuite, a provider of cloud-based financials/ERP and omnichannel commerce software, is expanding its regional executive leadership team, opening new Asia headquarters in Singapore and adding channel partners across the region. It has appointed Lee Thompson as senior vice president and general manager, Asia Pacific & Japan. Before joining NetSuite he was operating officer at TechnologyOne and before that senior vice president of corporate sales at Salesforce Asia Pacific.

Telecom Review Summit 'Its all about Networking' 2015 Dubai, UAE 13 December 2015

May 2015

Broadband TV Connect Asia 2015



Date: 12th-13th May 2015 Place: Suntec, Singapore

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Date: 2 - 5 June 2015 Place: Marina Bay Sands, Singapore http://www.CommunicAsia.com/

July 2015

Mobile World Congress Shanghai



Previously known as Mobile Asia Expo, Mobile World Congress Shanghai will celebrate the amazing possibilities that mobile brings. It will feature a massive technology exhibition with 250+ exhibitors, including Alcatel-

Lucent Shanghai Bell, China Mobile, Huawei, LeTV, Mozilla, Nokia, NTT Docomo, Visa, SK Telecom, Visa and ZTE and world-class thought-leadership conference with engaging keynote speakers and compelling panel sessions Incredible C-Level networking opportunities.

Date: 15-17th July 2015 Place: Shanghai New International Expo Centre, China

October 2015

LTE Asia



Celebrating its ninth year, LTE Asia is returning to Singapore with an extended conference program and new speakers from the whole ecosystem to give greater depth and breadth of discussion around the region's most pertinent mobile broadband developments.

Date: 6-8 October 2015 Place: Suntec, Singapore http://asia.lteconference.com

Latest updates on: www.telecomreviewasia.com



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