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The race to connect four billion people

n the first month of 2016 two global bodies – the ITU and the World Bank – came out with statements about the digital divide – the fact that there are still four billion people on this planet who do not have access to the Internet, but their ideas on what should be done about this are rather different.

Given the scale of the problem the ITU's solution is at best partial: The ITU backed UN Broadband Commission for Sustainable Development has a stated goal: "To make sure the next 1.5 billion people are connected and have meaningful access to the Internet by 2020." It put out a discussion paper, at the annual meeting of the World Economic Forum in Davos, in which it estimated the cost of achieving this as \$450b.

A meeting of the Commission in Davos pledged to "build on a range of innovative and important initiatives including: the UN Broadband Commission for Sustainable Development; the World Economic Forum's Future of the Internet Initiative; the GSMA's Connected Society program; the outcomes of the World Summit on the Information Society (WSIS); the US State Department's Global Connect initiative; Connect the World from ONE.org; the Alliance for the Affordable Internet; ITU initiatives to support implementation of the Connect 2020 Agenda; and UNESCO's programs on ICTs for quality education, and for culture and the sciences."

The World Bank report, which weighs in at a massive 359 pages, concurs on the four billion figure, but takes a different view as to the solution. The unfinished task of connecting everyone to the internet, it says: "Can be achieved through a judicious mix of market competition, public-private partnerships, and effective regulation of the internet and telecom sector."

However its ambitions go well beyond ubiquitous Internet. "The digital economy also requires a strong analog foundation, consisting of regulations that create a vibrant business climate and let firms leverage digital technologies to compete and innovate; skills that allow workers, entrepreneurs, and public servants to seize opportunities in the digital world; and accountable institutions that use the internet to empower citizens."

These are prerequisites to economic development of any kind, but: "Digital technologies add two important dimensions. First, they raise the opportunity cost of not undertaking the necessary reforms. They amplify the impact of good (and bad) policies, so any failure to reform means falling farther behind those who do reform."

The 'amplification power' of the Internet and digital technologies is about to ratchet up significantly as the Internet of Things gathers momentum. The authors of the World Bank report are skeptical. "There are still significant barriers to full commercialization of IoT, such as the fragmented landscape of standardization. ... There are also significant privacy and security concerns. As more devices are connected to networks, hacking unsecure devices could have repercussions that far exceed the damage posed by conventional security threats.

However true that might be today, those barriers will diminish, and likely faster than progress towards universal Internet. Whatever solutions are adopted – the rise of IoT adds urgency to the drive for a connected planet.

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Stuart Corner Senior Editorial Manager Telecom Review Asia Pacific

Singapore to restructure comms and media bodies



Singapore's Ministry of Communications And Information (MCI) is to restructure the Infocommunications Development Authority of Singapore (IDA) and the Media Development Authority of Singapore (MDA) to form the Infocommunications Media Development Authority of Singapore (IMDA) and the Government Technology Organization (GTO), both to be formed in the second half of 2016.

The move follows the launch, in August 2015, of the Infocomm Media 2025 plan, the first integrated industry development plan for the infocommunications and media sectors. It also recognizes the importance of the digital economy in transforming many sectors in the economy, as well as the need to support the transformation of government service delivery through even more intensive use of IT.

The new IMDA will develop and regulate the converging infocomm and media sectors in a holistic way. The new GTO will lead digital transformation efforts in the public sector. It will focus on providing a citizen-centric user experience and encourage the participation of citizens in the co-creation of public digital services.

In a statement MCI said: "The GTO will be well-placed to help government agencies capitalize on the speed of innovation and new technology trends such as robotics, artificial intelligence, Internet of Things, and Big Data. The new organization will also play a vital role in supporting Singapore's Smart Nation vision, especially in delivering the Smart Nation Platform and Smart Nation applications. The GTO will also focus on developing new technology capabilities as well as attracting and nurturing ICT engineering talent that will provide a strong foundation for Singapore's Smart Nation ambitions."

Huawei Marine to build Maldives submarine cable



Ooredoo Maldives has partnered with Huawei Marine to deploy a fiber optic submarine cable with the

aim of boosting broadband services in the Maldives. The 1200km cable will use Huawei Marine's 100G technology and will provide Ooredoo with an enhanced resilient network that can fully address the country's increasing communication needs across developing islands and new resort locations.

The Maldives has a 200 percent mobile phone penetration but only 51 percent of the population have Internet access (via mobile networks). The Maldives' minister of home affairs, Mr Umar Naseer said: "The Government has a strong vision of making Maldives one of the most digitally advanced countries in the region. Ooredoo's National Submarine Cable will greatly contribute towards the delivery of this vision, and we thank Ooredoo for their support in bringing the benefits of digital to all our people."

In 2015 Ooredoo Maldives launched a smart city initiative in the Maldives, committing to connect the nation with smart solutions aimed to enrich the lives of the population. As part of this the company introduced free Wi-Fi hangout areas across prime spots in the capital city including hospitals, ferry terminals, youth center, café's etc.

New cable to link Myanmar to Malaysia and Thailand



The Singapore-based Campana Group and Alcatel-Lucent Submarine Networks, now a subsidiary of Nokia, have announced plans to build MYTHIC (Myanmar-Malaysia-Thailand International Connection), a 1,600 km submarine cable system that will link Myanmar to Malaysia and Thailand with onward connectivity to Singapore, Hong Kong and beyond.

According to Campana, MYTHIC will offer a quicker, cost-effective and more reliable solution to meet Myanmar's huge growth in demand for international connectivity and will provide greater route diversity for data traffic. Alcatel-Lucent Submarine Networks will be responsible for the project on a turnkey basis. The two pair system will be based on 100Gbps technology and will have an initial design capacity of 20Tbps. It is scheduled to be completed by the end of the first quarter of 2017. It will connect Thanlyin, 18km south-east of Yangon, the commercial capital of Myanmar, with Satun Thailand with the option to extend to Penang, Malaysia and beyond. Campana's partners will then offer diverse fiber backhaul to Singapore via open access points of presence and to landing stations of other international submarine cables.

GlobeOne to provide mobile banking via VNPT- Vinaphone



VNPT-Vinaphone has signed a letter of intent with GlobeOne to offer GlobeOne mobile banking services in Vietnam. GlobeOne claims to be well positioned to capture Vietnam's huge cohort of digital natives converting to smartphones and enable Vinaphone to provide people with mobilebased access to meaningful and affordable financial services from their member banks, and the patentpending income-building SocialBoost program.

GlobeOne claims to provide "a new global platform for a community of networked member banks, corporate members and individual members." It provides individual members with access to the member banks for their financial services needs, and also provides a solution for financial exclusion and immobility. GlobeOne's mobile app will offer access through member banks to a demand deposit account, a security savings account, a secured line of credit, domestic and international transfers between GlobeOne individual members, as well as access to the income-building SocialBoost program, which gives members the opportunity to earn a new income stream while helping those who need it most.

GlobeOne is expected to launch in the United States, Mexico and Vietnam Q1 2016, with a goal of establishing a global network of member banks in 30 countries by 2020.

Nokia supplies LTE-A to Indosat Ooredoo



Indosat Ooredoo has selected Nokia Networks to supply an LTE-Advanced network. As part of the contract, Nokia Networks' Global Services team is deploying LTE base stations in key cities across the designated regions.

Nokia has also aggregated two carriers in the 900MHz and 1800MHz bands to deliver up to 150Mbps downlink speed to Indosat's subscribers in the Java, Sumatra and Kalimantan regions. Customers can now enjoy a wide range of data-intensive services like multimedia streaming, online games, cloud storage and video conferencing.

Solutions and services delivered by Nokia Networks include: network planning and optimization; design and implementation services; Nokia's Single RAN advanced radio access, including Flexi Multiradio 10 base stations; software to aggregate LTE carriers in the 900MHz and 1800MHz bands; NetAct, a virtualized OSS for effective and consolidated monitoring and optimization of Indosat's LTE-A network.

Alexander Rusli, President Director & CEO, Indosat Ooredoo, said: "Nokia Networks played a crucial role in realizing our vision to deliver the best-in-class mobile broadband experience across Java, Sumatra and Kalimantan. We were especially pleased with the speedy delivery, which put us ahead of schedule and enabled fast commercialization. We will continue to further expand LTE coverage across the country, with the ultimate goal of providing world-class data services to every subscriber using our network."

Alcatel Lucent submarine networks to build NZ-Hawaii cable



Alcatel-Lucent Submarine Networks, the undersea cables subsidiary of Alcatel-Lucent, has signed a turnkey contract with Amper SA subsidiary Bluesky Pacific Group to roll out a new submarine cable system spanning more than 9,700 km across the Pacific linking New Zealand and Hawaii via Samoa and the Cook Islands. The Moana Cable system, scheduled for completion in 2018, will have two main segments: the first segment, with two fiber pairs, will connect New Zealand to Hawaii, a distance of 8,000 km, serving Samoa and American Samoa and significantly enhancing route diversity for New Zealand. The second segment ,with one fiber pair, will link the Cook Islands to the Samoa hub over 1,700 km.

Alcatel-Lucent Submarine Networks will deploy its submarine optical technology based on the i1620 Softnode and OADM branching units to maximize capacity and network flexibility. The Moana Cable is also designed to accommodate the connection of additional Pacific island nations such as Niue, Tokelau and Tonga, which lie close to the New Zealand-Hawaii trunk, as well as French Polynesia on the East near the Cook Islands.

Moana will be the first long-haul submarine cable in the Pacific islands region relying on the latest 200Gbps per wavelength transmission technology, with ultimate capacity between Hawaii and New Zealand of 20Tbps.



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Subsea cables: capacity and more

Geoff Bennett discusses ways to extract more capacity and achieve enhanced differentiation in subsea fiber optic cable systems.

TELECOM Review

he move from 10Gbps non-coherent. to 100Gbps coherent wavelengths in all forms of subsea transmission is more or less complete, and has happened faster than analysts originally estimated. The 40Gbps data rate rapidly fell out of favor once 100Gbps economics became clear. Those economics were not only driven by increased spectral efficiency, but by associated technologies such as coherent super-channels. These have become key factors in enabling network operators to achieve service differentiation in a market that has long been seen as a commodity.

The coherent technology miracle

While the DWDM industry has an excellent track record of increasing capacity and data rates over time, the move from 2010 onwards to coherent transmission has delivered a quantum leap in capacity-reach product that will be difficult to improve on in the near future.¹

Figure 1 shows a typical 100Gbps coherent optical circuit – with "first generation" coherent having all of its digital processing power in the receiver that was focused on chromatic dispersion and polarization mode dispersion (PMD) compensation; and "second generation" coherent adding transmitter-based digital pulse shaping, additional chromatic dispersion compensation, and receiver-based non-linear processing.

This optical circuit is extremely capable, delivering over a twentyfold increase in the capacity-reach product compared to 10Gbps intensity modulation with direct detection (IM-DD). A key point is that this achievement has been possible over existing submarine cable wet plant, enabling a massive upgrade capability as network operators replaced existing submarine line terminating equipment (SLTE) with coherent systems.

The next step, of course, is to take full advantage of new submarine



Figure 1: Coherent transmitter and receiver indicating optical (red) and electronic (blue) component blocks.

cable types - in particular the large area/low loss G.654 fiber types that are being deployed in the latest subsea cable systems as positive dispersion cables (versus dispersion managed cable systems of previous deployment generations). These cables offer far better nonlinear performance, coupled with significantly lower attenuation, to the point where it could be possible to close long Pacific spans using Pol Muxed QPSK modulation (instead of PM-BPSK), and trans-Atlantic cables using PM-8QAM, or perhaps even PM-16QAM modulation (instead of PM-QPSK). The value delivered by moving to these higher order modulation techniques is a dramatic increase in spectral efficiency, and thus a higher fiber capacity.²

In March 2015, a major lab trial showed that it is possible to close "trans-Atlantic" distances (in this case over 7,400km) with PM-8QAM over a LA/LL fiber provided by OFS.³ Following these successful lab trials it is likely that we will see field trials, and perhaps even real deployments of higher order modulation technologies on subsea cables in 2016.

Superchannels: beyond 100Gbps

A number of academic papers have described how the industry is approaching a point of diminishing returns for capacity increases - and the conclusions are often simplistically represented as an approaching "capacity exhaust" in optical fibers.⁴ It may be true, for example, that the next generation of optical cables spanning the Atlantic could be limited to between fifteen and twenty terabits per second total capacity, and a trans-Pacific next generation cable to between ten and twelve terabits per second. It may be possible to double these limits by simply adding L-Band transmission to the existing C-Band systems, but this would require very different wet plant from what is installed, or is being installed, today.

Thus, when the industry asks the question "What comes after 100Gbps?" it is not typically a question of fiber capacity – this is a function of coherent technology, and the achievable fiber capacity is perfectly adequate for the current cycle of new deployments. Rather the question is focused on operational scalability; in other words, how can a single engineering team turn up significantly more subsea capacity in a given operational cycle? How can a network operator deliver services more quickly, and with more efficient cash flow?

The seemingly obvious answer is to simply crank up the symbol rate for the optical and electronic circuits FFATURF



shown in Figure 1. To deliver today's typical 100Gbps data rate using PM-QPSK (which carries 4 bits per symbol) would imply a baud rate between 32 and 35 GBaud (note that this quoted range of values is due to different sizes of forward error correction, FEC, overhead used by different vendors). But increasing the baud rate is not being achieved in practice for commercial products. The first single wavelength 100Gbps implementation, operating in 32-35GBaud range, began shipping almost five years ago, and here we are today with leading edge implementations still operating in the 32-35GBaud range. This is because the electronics that drive the optical circuit now represent a bottleneck for serial processing. Chip power is increasing, but it is doing so by offering more parallel processing power.

There are two ways that next generation coherent implementation may overcome this limit, and thereby increase the data rate per line card. One is by moving to higher order modulation techniques; ie PM-BPSK -> PM-3QAM -> PM-QPSK -> PM-8QAM -> PM-16QAM (which carry 2, 3, 4, 6 and 8 bits per symbol respectively). As pointed out above, moving along this scale increases spectral efficiency – with each modulation symbol "carrying more bits". But at the same time the optical reach will drop, with PM-16QAM losing about 80 percent of the reach compared to PM-QPSK, for only double the line card or fiber capacity.⁴

The other approach is to "go parallel" with multiple 100Gbps optical carriers. This means implementing multiple optical circuits, each operating at the optimum baud rate to achieve a balance between capacity and reach, on a single line card so that all the capacity can be brought into service in a single operational cycle. As mentioned above, the resulting optical signal is called a "super-channel". This is the direction that the entire optical industry is now taking to achieve greater operational scalability.⁵ Super-channel subsea systems are now widely deployed in all parts of the world, from the longest Pacific routes, through to cables that circle South America and Africa. and crisscross South East Asia and the Mediterranean Sea.

Using today's typical 500Gbps superchannel line cards, a single engineer can turn up five times as much capacity in the time it takes to bring a 100Gbps transponder into service; and the next generation of superchannel line cards will deliver 1.2Tbps of capacity (an ideal way to support, for example, the next generation of 400GbE services).

Adding cashflow efficiency

It is tempting to assume that OpEx for subsea operators could be driven down by simply implementing superchannel line cards with ever more capacity, but is this a viable approach from a cashflow perspective? In other words, while the network planning department would readily embrace a 500Gbps or even a 1.2Tbps line card in which all of the wavelength planning is done in one step, the finance department might be reluctant to pay for it until there are revenue-generating services that need to use it.

With a super-channel line card it is possible to license the capacity in 100Gbps "chunks" (note that while this is technically possible for any vendor's superchannel line card, you should check if your vendor offers this as a commercial option). With this approach, all of the wavelengths of the superchannel are lit from day one (avoiding the need for idler channels to be taken in and out of service), the network operator can pay for 100Gbps slices of capacity as needed. More importantly these 100Gbps bandwidth slices can be activated "instantly" (ie within the timeframe of the financial approval, and not usually limited by the technology activation timeframe).

This is a radical change in service delivery capability for a typical subsea network. An unforecast subsea transponder might have a lead time of the order of nine to twelve months, whereas a new 100Gbps slice of an existing superchannel line card could be activated in minutes.

A novel option would be to allow a network operator to maintain a "floating pool" of bandwidth licenses. These could be moved around the network if spare capacity exists on a given link, and an obvious application would be as part of a service protection strategy.

In Figure 2 we can see how this would work. Let's assume a cable

fault (eq caused by a fishing trawl, ship's anchor dragging, or a subsea earthquake) occurs between A and B. Protection techniques such as ITU-T Shared Mesh Protection can ensure service continuity against SLAs, but in this case it may be that the protection path over A-D-C-B is now carrying more traffic than the network operator's traffic engineering guidelines recommend. By activating a number of time-based bandwidth licenses it is possible to rebalance the traffic matrix and remain within traffic engineering parameters. When the original link is repaired, the licenses can be returned to the "pool".

This capability was used earlier this year on the AJC cable system after a subsea cable fault in 7,000 to 8,000 meters of water. Over 400Gbps of traffic was rerouted in just a few minutes using this "instant bandwidth" capability on the existing superchannels. This type of temporary capacity increase can come at no additional cost, and the licenses are simply returned to the bandwidth pool, in this case following the cable repair.⁶

Conclusion: subsea service differentiation

The move to 100Gbps coherent transmission for SLTE upgrades is now well under way. Existing cable capacity can be increased by perhaps a factor of ten – and new cable types offer even greater capacity, while taking full advantage of second generation coherent technologies.

But capacity on its own does not offer a clear differentiation for subsea operators. New technologies based on superchannel line card designs offer dramatic reductions in operational scalability while an "instant bandwidth" capability on these line cards reduces new capacity deployment times from months to minutes.

As internet demands driven by cloud services, higher video quality and high definition mobile devices continue to grow exponentially there has never been a clearer reason for subsea operators to look to innovative network upgrades.



About the author

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China's IoT arithmetic: Internet+ = Industry 4.0

On July 4, 2015, China's Premier of the State Council, Li Keqiang, unveiled China's Internet+ (sometimes written Internet Plus) action plan that aims to integrate the Internet with traditional industries, fuel economic growth and put China back on track to be a leading world economy.

> he idea for the Internet Plus action plan came from a concept introduced by the German government at the 2011 Hannover

Fair, called Industry 4.0, considered to be the: "Fourth Industrial Revolution."

It is Germany's vision for the future of manufacturing – one where smart factories can use information and communications technologies to "digitize their processes and reap huge benefits in the form of improved quality, lower costs, and increased efficiency," according to Sara Zaske writing in The German View.

Industry 4.0 is a favorite theme for German Chancellor Angela Merkel who commonly cites the idea in speeches about business or the economy. In early 2015, Merkel urged all of Europe to embrace Industry 4.0 when she addressed the World Economic Forum in Davos.

"We must - and I say this as the German Chancellor in the face of a strong German economy - deal quickly with the fusion of the online world and the world of industrial production," she said. "In Germany, we call it Industry 4.0, because otherwise, those who are the leaders in the digital domain will take the lead in industrial production. We enter this race with great confidence. But it's a race we have not yet won."

Following Germany's lead

Germany has maintained its position as one of the strongest economies in the world – a great example for other countries to look up to. Industry 4.0 ignited a beacon of hope for other economies around the world that were looking to expand into the realm of increased connectivity in order to increase production and prosperity.

A paper prepared for the 2015 World Economic Forum in Davos, Switzerland Industrial Internet of Things: Unleashing the Potential of Connected Products and Services, said: "Our research concludes that the Industrial Internet is indeed transformative. ... It will change the basis of competition, redraw industry boundaries and create a new wave of disruptive companies."

This yea, 'the Fourth Industrial Revolution' was the theme of WEF, held in January. WEF founder and executive chairman, Klaus Schwab, said the world stood on the brink of a technological revolution that would "fundamentally alter the way we live, work, and relate to one another," and that in scale, scope, and complexity would produce "a transformation unlike anything humankind has experienced before."

For the past few years, China's economy has certainly been in need of a boost. In 2013, China suffered its second straight quarterly slowdown. The Financial Times reported that trade growth had tumbled, imports had fallen, inflation had slowed, investment had weakened, and bank lending had declined pressuring the government to do more to prop up growth.

In November 2015, Business Speculator reported that China's third quarter GDP growth of 6.9 percent was



the slowest it had experienced since the global financial crisis. One of the ways that the Chinese government tried to fix the "sharply decelerating economy" was by ramping up fiscal expenditure, which according to the Finance Ministry surged 36.1 percent in October from a year earlier to 1.3 trillion Yuan, while fiscal revenue increased to 1.44 trillion Yuan.

"This increased stimulus effort had taken the fiscal deficit-to-gross GDP ratio to a six-year high, according to a new report by Morgan Stanley," writes Peter Cai for Business Spectator. "Though the government is increasing its expenditure, it is unlikely to embark on another round of mega-stimulus effort, as in 2008, to counter the global financial meltdown."

Mike Wheatley, writing in Silicon Angle, describes China's Internet Plus initiative as an aim to "help foster growth of e-commerce and web companies in the country as part of a wider effort aimed at stimulating the economy."

Integrating Internet & the economy

The Xinhua news agency reported Li Keqiang describing the initiative as an aim to "further deepen the integration of the Internet with the economic and social sectors, making new industrial modes a main driving force of growth by 2018."

The purpose of the Internet Plus initiative, according to Li, is that it maps various development targets and supportive measures for key sectors of China's economy. The Chinese government hopes that it will lead to "new industrial modes, including mass entrepreneurship and innovation, manufacturing, agriculture, energy, finance, public services, logistics, e-commerce, traffic, biology and artificial intelligence."

According to Wheatley, in order to turn these goals into reality, Li has said that the Chinese government will "encourage and assist more Chinese firms to boost their presence in international markets, while training and making better use of both local and foreign talents."

Wheatley further reports that China aims to launch more pilot zones and encourage innovation demonstration zones such as Zhongguancun, the Chinese version of Silicon Valley. Furthermore, China has also moved to conceive a new "National Big Data Strategy" which aims to improve public administration.



Premier Li intends to drive passion for innovation to build the new engine for economic development and encourage the people of China to start their own businesses to prop up the economy. With 780 million broadband users, 555 million mobile users including 162 million 4G users as of December 2014, the Chinese government hopes to initiate a broad "uberisation of economy", where anyone can sell or buy their own products and services.

Yongfu Yu, head of mobile business at Alibaba, has stressed that the Internet Plus initiative will be the "end of an easy era", where traditional entrepreneurs copying modules from the US would be replaced by contemporary 24/7 servers, thus connecting people and opening new opportunities for everyone. For Yu, the initiative is about "restructuring supply and demand, creating a second spring for entrepreneurs, and more variance for customers."

In order to demonopolize state-owned enterprises, restrict government intervention in the economy, lower the threshold for new technology and emerging industries, and boost competition in the market, a package of \$4.4 billion has reportedly been allocated to invest in startups in China and technologies which can help the plan move forward, increasing the country's already huge R&D spending.

Praise for Government's focus

The Internet of Things will play a vital role in the Internet Plus initiative. The GSMA issued a report detailing how China is emerging as an IoT leader, with GSMA CTO, Alex Sinclair saying: "It's been the government's focused strategy, emphasis on common specifications and cross-sector collaboration that has allowed the Internet of Things to scale, delivering positive benefits to businesses and consumers alike."

The report states: "China leads the world in adoption of M2M services, with 74 million connections at the end of 2014, representing almost a third of the global base."

According to the report, IoT in China is benefitting from both government support and productive partnerships between companies from different sectors. "Of course, China can also generate enormous economies of scale, while the country's rapid economic growth and development is driving adoption of new technologies, as the urban population grows and the middle class expands," says the report.

As part of the Internet Plus initiative, there has also been a push from local governments in China for smart cities and implementing IoT into society. "Many local governments plan to use smart city applications to address key administration challenges, such as congestion and pollution," says the report.

"More than 90 percent of China's provinces and municipalities have listed IoT as a pillar industry in their development plans," announced Xi Guohua, vice minister for the MIIT in September 2014. "Government support is important because the IoT industry is still in its primary stage," he added.

202 smart city pilots

The government has since selected 202 cities to pilot as smart city projects. Beijing, Shangai, Guangzhou, Hangzhou and other large cities in China have established extensive database and sensor networks to collect and share information related to transportation, electricity, public safety, and environmental factors.

The wearable tech market has also taken off in China, with thousands of products, such as smart-watches. tracking devices, and fitness bands available at accessible prices. In addition, the connected car market is also rising in China, driven by the increasing availability of 4G network coverage which is promising a range of in-car services such as entertainment, navigation, safety and vehicle diagnostics. Machina Research predicts that China will soon become the world's largest connected car market after Russia, with the sector increasing from 16 million in 2015 to 67.8 billion in 2020.

China is pursuing a strategy to drive economic growth through the integration of Internet technologies. To grow its economy it is embracing the idea of an internationally connected market, fostering new industries and business development, including e-commerce, finance, public services, and much more.

How teleos can tame the data de

Nick Wilson explains how communications service providers can use analytics to transform aging copper into golden growth.

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ealing with constant change has become the new norm for communications service providers (CSPs) as they try to compete not only with each other, but also with a host of new competitors attacking previously safe revenue streams. CSPs in Asia Pacific have found themselves at the center of a hyper-connected world where new players are emerging almost daily and business agility is now critical to meet customer expectations.

To remain relevant, CSPs must avoid the race to the bottom on pricing, which relegates them to being 'dumb pipes' burdened with the losing proposition of having to provide more whilst charging less. They need to find new ways to challenge over-the-top (OTT) players. They need to respond to the disruption OTT players cause to traditional CSP revenue streams by



offering new services that are difficult to provide without having direct control of the underlying network.

Much of the shift in demand profile for CSP services is driven by the increasing use of machine-tomachine (M2M) technology – the interconnection of intelligent devices and management platforms. Research firm Analysys Mason has tipped this to grow from 2.3 percent of total mobile connections in 2014 to 7.9 percent by 2020. That's huge considering total mobile broadband connections are predicted to reach 4.8 billion in Asia Pacific and Australia during this period.

As M2M services mature over the next several years we will enter the realm of a super-capable ecosystem – the Internet of Things (IoT) and its logical successor, the Internet of Everything (IoE) – which are opening up unprecedented opportunities. CSPs that grasp the nuances of this shift to transform their operations and exploit the potential of this technology will be well positioned to introduce new, sustainable services and business models that deliver unmatched levels of customer experience.

But here's the catch: the key to making this possible is investing in analytics for the optimization and personalization of network services. Network services provided by the CSP to connect OTT application providers and their users are central to the OTT application's ability to deliver a superior customer experience, whilst minimizing the underlying operational costs.

Using analytics as a differentiator

Critical to any successful IoT strategy is the ability to efficiently analyze the connection quality, timing and distribution of the communication between devices and users. The amount of data this generates is both massive in scale and continuously evolving. In some markets, such as Australia, this meta-data is now required to be captured and retained for law-enforcement purposes. Initially, this will impose an additional cost on network operations. However, in the mid to long-term, CSPs will leverage this data to their advantage via the application of analytics to create 'actionable intelligence' on what the devices and people who use them are actually doing in an aggregated manner across all applications.

These insights will help them to:

Unlock new revenue opportunities

 analyzing user behavior to predict trends and develop new products and services in anticipation of expected demand. This may involve sharing insights with partners with a different view of customers to add value as well as increasing revenue for existing services.

Strengthen existing products

 identifying niche user needs by tracking usage patterns on a geographic basis relative to the consumption of other products and services. This affords the ability to provide insights on how to modify existing products to differentiate them so they can meet the requirements of particular micro segments.

 Monetize infrastructure – creating new services that provide interactive network controls based on the analysis of network traffic trends and performance. These services will directly expose analyses to M2M/IoT and OTT applications, modifying the demands they make of the underlying infrastructure. Smart CSPs will use this capability as part of their software defined networking (SDN) or network function virtualization (NFV) strategies to defer the cost of upgrading core network capacity by enabling traffic to be prioritized in different ways. This keeps them relevant and lessens the chance of them being sidelined as 'dumb pipes'.

Ultimately, the aim is for CSPs to provide higher value products and services to stakeholders and users, helping to drive customer satisfaction and loyalty as well as revenue.

CSPs also need to think beyond traditional connectivity

Connectivity has been a natural area of interest for most CSPs in this early phase of IoT adoption. However, it hasn't taken long for market leaders to realize that the bulk of revenue will come from areas outside a typical CSP's traditional product suite. Because connectivity is a readily available commodity, increased revenue for the majority of CSPs will come from innovation and value-add for specific industries.

Launching a successful M2M service involves a suite of core technologies beyond smart devices that includes data center and computing facilities, appropriate connectivity infrastructure and management platforms, as well as logistics and field support. These principal components are typically managed by the CSP and provide the foundation on which industryspecific solutions can be designed and delivered.

Close collaboration between CSPs and industry partners is needed to conceive and deliver a service that provides business benefits for everyone. Industrialization of M2M services also requires legal and regulatory frameworks and most importantly, heightened security.

The latter is crucial since new vulnerabilities emerge every day in this hyper-connected, software-centric environment. CSPs have a critical role in enabling end-to-end security since they control the network infrastructure and have wider visibility of traffic anomalies when they occur. High levels of security for industry-specific applications is particularly important in areas such as healthcare and financial services, and it can be delivered either entirely by the CSP or with the support of third-party providers.

The need for speed

Like all disruptive technologies, the rapid spread of M2M and IoT services forces CSPs to reinvent their organization and business processes to truly benefit from this phenomenon.

Success will be determined not only through embracing analytics to extract valuable business insights, but also by how quickly CSPs can transform their operating model to adapt to the unique needs of the changing marketplace.

As CSPs get started on planning their IoT strategy, here are five things they need to consider:

1. Explore ways to sell cellular

connection in bulk that enable rapid M2M service deployment. These can be delivered and serviced by third parties, and self-managed by the customer as part of a suite of complex industry-specific applications.

2.Factor in service needs beyond basic connectivity that involve other

components such as sensors in cars and household appliances, as well as vertical applications delivered in the cloud.

3. Ensure operating models can rapidly adapt to changing market conditions to maintain a pivotal leadership position. Dedicated business units will be required for M2M offerings, including product management, sales, partnership management and operations support.

4. Consider future investments

strategies so the IT department can go beyond operational efficiency improvements to support growth and new projects, as well as management of monitoring devices.

5. Plan for an expanded role for IT,

ideally, accompanied by changes in culture, processes and skills, as these can be serious barriers to a successful transformation program.

Using analytics to focus your IoT vision

The huge growth of big data and the evolution of M2M technology to the Internet of Things both affords opportunities and poses threats for the telecommunications industry. To thrive in such a dynamic environment, CSPs must start using analytics to help formulate their responses now as the traditional telecom business model continues to lose its effectiveness to OTT pure plays.

To succeed in the most optimal and least disruptive manner, CSPs need a comprehensive technology strategy and roadmap to harness the vast amounts of business data available to them (and only them) through analytics.

A key differentiator will be the ability to capture, analyze and convert IoT data into rich consumer insights – and ultimately use analytics to turn copper into gold.

About the author

Nick Wilson is general manager, enterprise services and managing director of Hewlett Packard Enterprise, South Pacific.

The next frontier for indoor wireless coverage

In today's mobility-dependent world good inbuilding mobile coverage is essential, but it can't be left to the operators and it shouldn't be an afterthought when buildings are being planned, says Matt Melester

0

ver the last several years, wireless operators have focused on covering the largest public access venues — stadiums, arenas and airports—with cellular services. In these types of venues, it's all about providing high network capacity to a high concentration of subscribers. In US football stadiums, for example, some operators have deployed distributed antenna systems (DAS) with over 60 sectors for each frequency band. This design delivers plenty of capacity to fans for watching video replays and using other data-intensive applications. Future upgrades for adding more capacity and frequency bands will likely be necessary, but solid foundations for wireless are in place there.

The next frontier for indoor wireless is the mid- and large-size enterprise buildings – office complexes, highrise apartments and commercial buildings – that are typically privately owned. The challenges of deploying wireless in private access venues are significantly different from those posed by stadiums in terms of the customers and channels involved, as well as the technical requirements. The most significant difference is the operators' willingness, or lack thereof, to fund these systems.

Operators recognized they needed to invest in wireless for large public venues because their subscribers demanded service there. But the return on investment for private enterprises is less certain. As such, operator willingness to fund in-building wireless in private enterprises is not as strong, particularly as they pursue other investments such as new spectrum, acquisitions and network virtualization.

As a result, enterprises will likely need to invest in the equipment themselves. This is a much different model, and overall there is no consistent process to help the enterprise acquire and deploy a system successfully. Even if an enterprise is willing to fund a system, an operator has to provide the radio and backhaul to their network. The process for getting approval from one operator to another is different, making the situation daunting and confusing for many enterprises.

More challenging than Wi-Fi

Remember, we are generally dealing with IT organizations in private enterprises, not RF managers from the major network operators who are intimately familiar with cellular communications. A significant barrier of ignorance stands between these worlds. Enterprises typically have little to no understanding of cellular. They want it be no more complicated than Wi-Fi – and unfortunately, it generally is more complicated. The IT installation companies they deal with are probably themselves only slightly more knowledgeable about cellular.

To remedy this barrier to in-building wireless in the enterprise space, vendors need to provide wireless systems that look and act more like the infrastructure that IT managers know. Many vendors like CommScope are doing exactly that. DAS continues



to be enhanced to better meet the needs of commercial buildings. Small cells offer a great alternative for cost-effective coverage for enterprises, particularly for single operator applications with a limited number of frequency bands. Managing interference inside buildings can be challenging, but newer solutions address this issue. For this reason, CommScope recently acquired Airvana to supplement our offering to enterprises.

The key stakeholders in the enterprise need to undergo a bit of a mindset change, too. Recent research commissioned by CommScope found that only about half (56 percent) of building managers, facilities managers, real estate managers and architects always consider mobile connectivity for a building's tenants as a factor when working on projects. However, three quarters (73 percent) of respondents cited it as an 'important' or 'very important' factor.

Wireless should start with the architect

There is a disconnect here. Building owners and managers have to ensure that tenants are always connected in today's increasingly mobile, dataintensive era, and that buildings are future-proofed for tomorrow. Better planning for indoor wireless networks, even from the time buildings are being constructed, would help ensure adequate wireless coverage and capacity. Deployment in the building construction phase can avoid significant disruption to tenants when systems are added afterthe-fact. This can also save on the considerable cost involved in building retrofits. The sooner architects,

building owners and managers start planning for wireless, the easier it is to deliver high quality, high bandwidth networks.

In 2016, we expect to see more enterprises start to invest in their wireless systems. These early adopters will lead the evolution to a new model where building owners and IT managers take the lead in buying and deploying in-building wireless solutions. DAS and small cells will continue to evolve to support this important market segment. The needs of mobile users in commercial spaces are too great to ignore. The paradigm shift to new funding models and ways of thinking about wireless systems is already underway in North America. The evolution of in-building wireless will continue in 2016 and eventually carry over to all regions. CommScope will continue to develop innovative solutions to address the changing marketplace.

About the author



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Call To ACTION

- Change the World... Digital World Courage to Disrupt... Or Get Disrupted
- Accelerate Your IoT Plan
- It's All about Outcomes
- Ecosystems / Your Partners to Achieve
- Double Bottom Line... Financial + Social
- Think Big and Take Risk!

It's Now About Acceleration

sco warns o

Cisco hosted its third IoT World Forum in Dubai in December, warning that IoT would be massively disruptive, and saying that most companies, and countries would be overwhelmed by the rapidity of change.

What you are seeing is the second generation of the Internet. It will transform the life of every person in the world. It will result in 19 trillion dollars of value over the next decade. It will transform every single business, every single city every single country."

That was Cisco's former long serving CEO and now executive chairman, John Chambers, addressing a press briefing at Cisco's IoT World Forum in Dubai in December. It was the third event of its kind, following Chicago in 2014 and Barcelona in 2013.

This year, though, things were different. IoT has hit prime time, according to Chambers. "Two years ago it was missionary work. How do you get the excitement going? How do you make things happen? And it was not usually people at the CEO level, not even on the steering committee. It was the number two or number three level.

"Today IoT is at the very top of every CEO's agenda. When you talk to government leaders they understand fully that this will change their country. They also know that if they fall behind they will get left behind."

IoT Inflection point in 2015

"What has happened in 2015 is that IoT has hit an inflection point," Chambers said, "There is not a major government leader or a major industry player that does not understand that this will give them opportunities but could dramatically disrupt them. It will level the playing field in terms of the ability of small companies to compete with big companies. And they key question is whether you are going to be the disrupter in your industry or you are going to be disrupted. Companies that do not reinvent themselves, that do not get the business models and technology right will be left behind."

According to Chambers, the majority of companies around the world will become digital companies by 2020 but only about one third of those digitization efforts will work. "The reason they will fail will be very simple: it will be that the company culture did not accept the change,



that they were not able to break their teamwork down into individual group. They did not apply the resources properly and they did not address the very valid concerns of security and privacy."

Chambers predicts that IoT will transform the world at a pace of 10 to 15 times faster than today's Internet did, but he doesn't see most companies, cities, or countries keeping up. "Every company, every city every country is going to go," Chambers predicted. "Most of them will fail because they don't think horizontally; they don't think about standards. Some will fail because they think it's about technology when it is about organization and process change and speed of innovation."

He does not include the host city for the 2015 World Forum, Dubai, in that category, saying that Dubai understands very well what needs to be done.

Dubai is smart, says Cisco

Anil Menon, Cisco's President, Smart+Connected Communities, said Dubai was rapidly transforming into becoming one of the smartest digital cities in the world, connecting the unconnected through the power of intelligent networks. "We have passed the incubation phase, now IoT/smart city solutions are ready to be scaled. Cities who scale first will be the winners in an increasingly competitive environment."

It's easy to see why Cisco chose Dubai as the location of its third IoT World Forum: the city has a goal to be the world's smartest city by 2020, and is under time pressure to make significant progress towards that goal.

Dubai's smart city goal was set two years ago by Dubai's ruler, His Highness Sheikh Mohammed bin Rashid al Maktoum. And just two days before Cisco's IoT World Forum rolled into town he issued new laws aimed at accelerating progress towards that goal.

According to the press release on Sheikh Mohammed's website, its new laws aim to "enhance the progress of the Smart City initiative and encourage innovation in this sector by fostering collaboration between the public and private sectors."

The new laws establish the Dubai Smart City Office, provide for the formation of its board and the appointment of a director general. The office is charged with developing policies and strategic plans for information technology and smart government, supervising and providing guidance for the smart transformation process and approving joint initiatives, projects and services to facilitate the process.

The law authorizes the office to enter into smart city partnerships with any organization within and outside the emirate and to propose legislative amendments to encourage and empower public and private sector smart transformation initiatives.

There is now certainly some urgency towards making Dubai, if not the smartest city in the world, at least a very smart one. Shortly after the goal was announced Dubai was chosen as the host city for the 2020 World Expo by the Bureau International des Expositions, a body of 167 member states that oversees selection and organizing of World Expos.

The Wall Street Journal reported: "Dubai Expo 2020 will be a six-month long exhibition of trade, innovation and products from around the world, and a showcase for the United Arab Emirates. It will be held on a giant yet-to-be-built 438-hectare site on the edge of Dubai."

Hosting World Expo 2020

The Government is aiming for 25 million visitors. The WSJ, in a comment piece "What Does Hosting World Expo 2020 Mean for Dubai?" said: "[This is] an optimistic figure compared with the 10 million visitors last year, and the 16 million expected in London this year, the leading city worldwide for visitors."

The IoT World Forum abounded with statistics on the claimed benefits of IoT and the impressive returns on investment it offers, and there is no doubt that if you can increase efficiency of any multibillion dollar global industry by just one percent, the returns will be significant.

Dubai's announcement of the smart city initiative in October 2013 was short on specifics, but it did say: "As a smart city, government departments will be inter-connected to provide faster services and information to all citizens and guests. ... The new project to turn Dubai into a smart city will offer connected users up-to-the-minute information on weather, traffic, entertainment, tourism, flights, dining, emergency services and much more. Businessmen and investors will benefit from open access to smart services offered by ports, customs and bourses."

A true smart city, however, is much more than these and the formation of the Smart City Office, two years down the track, suggests that the Government recognizes that separate, independent projects, no matter how useful and beneficial do not a smart city make, and that an overarching strategy that co-ordinates and in some cases The Internet of Things will transform every single business, every single city every single country



interconnects different initiatives is needed.

Dubai's smart city projects

There were several interesting, and useful, Dubai smart city initiatives on show at the Forum:

- A ruggedized Cisco router installed in police cars aggregates data from numerous systems including body cameras and biosensors worn by police officers, car mounted cameras for number plate recognition;
- Street lighting is controlled to optimize lighting and minimize energy wastage;
- Parking sites are monitored and their occupancy made available to drivers;
- Bus shelters provide real time information on bus arrival times and occupancy levels;
- Emirates Airlines is using a range of asset tracking technologies to optimize aircraft maintenance.

The challenges facing Dubai will be faced by every city in the world struggling to be smart. The impending World Expo means it will be facing those challenges sooner than most. It will likely provide some useful lessons over the next few years, to help others meet the challenges spelt out by Chambers.

The author attended the IoT World Forum as a guest of Cisco

what's coming in 2016

Ben Cardwell puts the spotlight on the cell-site options available for mobile operators struggling to meet surging demand and minimize rollout costs.

> he wireless industry is in the middle of the 4G technology cycle. The major LTE coverage builds in first-mover markets

are largely done, and operators are now in adding capacity to those networks. The industry is also in the midst of the evolving to the next generation of virtualized wireless networks. The 5G vision is blurry, but there are three primary trends for the evolution of the outdoor radio access network (RAN): densification, virtualization and optimization.

Densification

A recent report predicted that total monthly mobile data traffic would increase at a compounded annual growth rate of 45 percent from 2015-2021. So the need for wireless operators to add capacity to their

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networks to meet this demand will continue over this period. Small cell deployments were expected to be the leading network densification tool. However, operators continue to face some serious challenges when deploying small cells outdoors, namely site acquisition, power and backhaul. Getting access and permits to tenable sites, and delivering power and backhaul to them, can be roadblocks. These factors can make costs prohibitive, and limit the number of users that can be served from any given cell site.

Some operators have devised creative solutions to these challenges. For example, Vodafone collaborated with advertising giant JCDecaux to put small cells in bus shelters in Amsterdam. Notwithstanding these creative solutions, I expect more macro cell sites to be deployed in 2016 than small cells. A leading way to add capacity in the macro network is to use sector splitting. Taking a three-sector site and turning it into six sectors basically doubles the capacity. Sector splitting tends to be more cost-effective that small cells and I expect to see more focus on such macro network solutions this year.

Virtualization

The long-term goal of many network operators is to evolve to cloud RAN architecture. Cloud RAN moves the baseband processor into the core network from the cell site. A network that is completely run in the cloud would have equipment placed centrally in a big data center with digital-to-RF converters located at the edge. To accomplish this operators need dedicated fiber links with very low latency and very high capacity from every cell site to the central core.

Cloud RAN architecture will improve network performance with capacity that can be optimized dynamically. We are already seeing the benefits of this model with in-building cell sites where centralized capacity can be adjusted dynamically to meet actual usage. For example, when all employees gather in a large auditorium in a large office building, a cloud RAN architecture enables capacity to be re-allocated automatically to these areas.

The next phase of cloud RAN evolution will be outdoors. This will not be completed in 2016, but some operators are making significant progress. I expect to see more cell sites with baseband processing moved into centralized locations. Of course, the challenges of site acquisition, power and backhaul apply to these centralized sites as well.

Optimization

In the midst of this Cloud RAN evolution, one rule still applies. Network operators need to squeeze as much capacity as possible out of their existing networks. Optimization of a cellular network can be compared to the steps taken to make a car more energy efficient: taking excess weight out of the trunk, using better gasoline, driving on good tires, etc. When it comes to optimizing the RAN, it's largely about having the best signal to noise ratio. Simplistically, this means making the desired signals to be really loud and everything else to be really quiet.

In LTE networks, the most significant source of interference is passive intermodulation (PIM). PIM can result in significantly degraded voice quality, dropped calls and reduced data throughput. The effects of PIM can be drastic - just a one decibel drop in uplink sensitivity due to PIM can shrink the wireless coverage area by more than 10 percent. Network operators strive to minimize address PIM in all phases of network deployment. They are even raising their key performance indicators to further decrease its impact on their networks.

2016 will be an interesting year for the wireless industry. On the one hand, we are in a lull between the major rollouts of LTE and the future deployment of 5G. But the seeds of what will ultimately make 5G are appearing now. More sites, with more virtualization and a continued emphasis on optimization will underpin the wireless networks of tomorrow. A denser, more nimble and more efficient network is the goal. 2016 will be a significant milestone on that journey.



Ben Cardwell is the senior vice president and segment leader of CommScope Mobility Solutions.

South Korea tops ICT development, Internet speed & LTE coverage

South Korea, a nation no bigger than the US state of Indiana, saw its economy surge from 1962 to about 1994 at an average of 10 percent annually, fueled by annual export growth of 20 percent during a period called the "Miracle on the Han River".

TELECOM Review



hat 'miracle' transformed South Korea into a highincome advanced economy. It is now the world's sixth largest exporter and

seventh largest importer, and is home to some of the world's most influential technology brands such as Samsung, LG and Hyundai-Kia. South Korea has emerged as an industry leader and has been named the world's most innovative country in the Bloomberg Innovation Index.

South Korea's rapid growth has produced some impressive statistics: it now has the world's top ICT development, the world's fastest Internet and the best LTE coverage. Situated between China and Japan, two of the mightiest modern technology states, South Korea outperforms them in many ways.

A planned economy

According to Andrew Braun who writes for IDG Connect, South

Korea's tech dominance is the result of government planning, healthy competition, private-sector growth and the Korean culture. None of these factors has singlehandedly produced South Korea's leadership but together they have created a country with an excellent and efficient system.

Back in 1995 South Korea had only one Internet user for every hundred citizens. In that year the Korean government initiated the Korean Information Infrastructure project that ran for ten years. The government got to work laying Internet infrastructure throughout South Korea and by 1998 the entire country had broadband connections.

According to Braun, by 2000, South Korea had connected 20 million of its roughly 45 million citizens to the Internet, outperforming the likes of Japan and France. Today about 84 percent of the country's population is connected to the Internet (95 percent on broadband). In addition, healthy competition contributed to the South Korea's telecommunication growth. Having adopted a policy of deregulation in the private sector South Korea was able to ensure that barriers to entry were low for new internet service providers (ISPs), which brought about healthy competition.

"With these liberal standards in place," writes Braun, "private-sector operators were able to expand the Internet from a skeleton framework into a country-wide system, and speed up the Internet through relentless competition." In 2005, large telecom companies were put under pressure by smaller competitors who were picking up shares in the DSL market (which was the primary connection method at time).

It was then that Korea Telecom began to lay fiber optic networks, which helped it retain market share and upgraded South Korea's Internet capabilities.

Private & public sector synergy

According to Linda Butcher, Director of Media Relations and Public Affairs at the Korea Economic Institute. it was not only the Korean government that encouraged the adoption of the Internet, but also private companies that undertook much of the structural work. "In a country like Korea." Butcher told Braun in an interview. "when you get a green light from your government, you go ahead with full-force and try to be successful in that field," she said, referring to the symbiotic relationship that businesses seem to have with the government in South Korea.

This cooperative relationship between the private and public sectors of South Korea, according to Braun, encourages innovation and competition, and as a result, "the country's technology-driven economy provides a host of benefits to its citizens."

The citizens of South Korea live in a wealthy, comfortable country, considered by the Human Development Index to be the most developed in East Asia, and among the world's richest.

Much of the technological innovation in the country is influenced by the Korean culture. As a traditionally Confucian society, South Korean culture emphasizes achievement and education. Braun points out that the South Korean government "recognized this ethic in their citizens" and actively promoted the Internet as a tool for education and advancement. Braun further adds that South Korean culture "emphasizes the importance of work ethic and perseverance. Once they set their sights on technology, there was no going back."

South Korea was recognized in 2015 by the ITU as the only Asian country to lead the ICT Development Index (IDI). The ranking is a composite measurement that ranks 167 countries according to their level of ICT access, use and skills. South Korea shared the top ranking with Denmark and Iceland, outperforming other high-income nations from other regions including Australia, Bahrain, Barbados, Canada, Hong Kong, Japan, Macao, New Zealand, Singapore and the United States.

LTE coverage leader

South Korea also tops the rankings of LTE coverage. According to data provided by OpenSignal, in certain countries around the world, LTE has become a "near ubiquitous technology". OpenSignal collected its data from smartphone owners through its app, which is available on iOS and Android. For its report The State of LTE OpenSignal gathered over three months' worth of data in 2015 from thousands of users with LTE-capable phones and able to connect to operators with live 4G networks.

From the data collected, South Korea came out on top, providing download speeds in excess of 25Mbps and near ubiquitous 4G coverage. Singapore was not far behind, with three major operators beating South Korea in terms of speed, but unable to match South Korea's network availability.

Korea Telecom's Olleh stood out as one of the fastest networks in the world, and delivering an active LTE signal 96 percent of the time. In comparison, the United States has below-average speeds, but decent coverage, whereas Japan's operators provide excellent coverage but average speeds.

South Korea also came out on top for LTE availability. Customers on South Korea's networks can connect to LTE 97 percent of the time, making 4G almost as pervasive as 2G and 3G networks in the country. Even more impressive was the individual performance of South Korea's LG U+ which had LTE availability of 99.6 percent. Japan also scored well, but no other country was able to provide a 4G signal more than 80 percent of the time.

South Korea is the perfect example of a country that has deployed new LTE systems in new frequency bands, South Korea has the world's top ICT development, the world's fastest Internet and the best LTE coverage



adding more capacity to its networks, allowing it to serve more customers without reducing performance. Every operator in South Korea now has LTE running on three different bands, all using an LTE-Advanced technique called "carrier aggregation" which combines bandwidth at different frequencies for faster connections.

Some of the earliest countries to introduce LTE, such as the United States, Sweden and Germany are beginning to fall behind in terms of data performance. The reason for this is that LTE's early introduction has resulted in a large base of customers, all competing for the same network resources and reducing average speeds.

The US has also failed to keep up with the rest of the world in both spectrum and technology where all four major US operators have been expanding into more frequency bands, but have not been able to match the capacity of countries like South Korea and Singapore.



IDC's IT Services Predictions for 2016 and beyond for Asia Pacific region highlight the impact cloudfirst and digital transformation over the next three years.

lobal IT market research firm IDC says that 33 percent of organizations in Asia Pacific have adopted a 'cloud first' strategy, with important implications for IT suppliers.

IDC predicts that IT budgets dedicated to cloud services will increase to 26 percent by 2016, and 50-55 percent of traditional outsourcing managed services will have a cloud delivery model.

The concept of a 'cloud-first' strategy began in the US Federal Government and has since spread into the commercial sector, according to Larry Freeman, NetApp. It was a mandate issued to all federal agencies by the chief information officer of the United States in December 2010. By 2012, a subsequent report to Congress showed that more than half of all federal agencies had adopted cloud computing or at least one application. It has since moved into the commercial arena.

Full cloud migration can deliver impressive results, such as reduction in hosting costs and reduced equipment, licensing and labor costs all with a substantial capacity increase. Cathy Huang, Research Manager, Services and Cloud Research Group at IDC says: "This year's services predictions highlights 'cloud-first', suggesting 33 percent of Asia/ Pacific enterprises will pursue a 'cloud-first' strategy. The switch to cloud-first/cloud-only points to two opportunities in the APeJ services market. Enterprises are looking to differentiated capabilities or cost competitiveness based on cloud-



based offerings. In addition, it also means sourcing strategies in the past may be incompatible as organizations leverage a cloud-first strategy."

Multiple transformative technologies

IDC has identified digital transformation as the biggest influence to organizations throughout the Asia/Pacific region in 2016 and beyond. It expects innovation accelerators like the Internet of Things (IoT), cognitive computing, robotics and 3D printing to drive forward this transformation. With 5G on the horizon, drone technology and the development of personalized artificial intelligence robots, IDC says the pace of digital transformation will accelerate.

Digital transformation is essentially the process of understanding where an organization currently stands, and then determining where there is need to use technology in order to achieve business objectives. Digital transformation is becoming a competitive requirement and the source of a massive wave of new investments in services to support changes to business operations and customer services, IDC says.

A recent survey by IDC found that a majority of Asia Pacific excluding Japan (APeJ) enterprises have digital transformation projects underway in some form or another. "Getting on board the digital transformation train is going to be fraught with challenges, starting with the ability to define digital transformation," says Linus Lai, Research Director with IDC's Asia/Pacific Services Research Group. "Most early stage projects involve experience transformation but little attention is being paid on the other dimensions like information governance and worksource, which often leads to disillusionment on the benefits of digital transformation."

Lai adds: "As part of enabling enterprises on their digital transformation journey, service providers need to emphasize their ability to bring a full suite of services capabilities that includes integration of cloud, cognitive, mobile and analytics delivered 'as a service'. In addition, industry expertise can offer functional insights which are also needed."

IDC has coined the term 'Third Platform Technologies' embracing mobile, social, cloud and big data to distinguish the current IT environment of from earlier eras of computing. It says this is driving demand for related services and fundamentally changing the way organizations interact with their ecosystem.

IT and line of business must get closer

IDC says 65 percent of APeJ enterprise strategies will include a significant Digital Transformation component; and by 2018, 80 percent of major IT decisions will involve a partnership between the IT organization and LOBs. Furthermore, by 2016, 30 percent of enterprises are predicted to implement software-defined infra in their datacenter; and by 2018, 20 percent of all enterprises will be leveraging digital platforms from such firms as WeChat, Uber, GE/Predix and PTC to achieve DX goals.

IDC says the impact of third platform technology accelerators such as IoT and next-gen security will demand an increased focus on governance between the IT organization and the lines of business (LOB) to ensure risk, supplier choices, failover, innovation and agile development are understood between both parties, and the value of integration, management and security is brought to the front.

IDC predicts that, by 2020, in excess of 75 percent of ideas, talent and innovation will be sourced through ecosystems of engagement, and by the end of 2017, 55 percent of enterprises will rely on third-party management of their security infrastructure.

Playing the global (telephone) numbers game

Unified communications is becoming an increasingly important tool for driving time to market and revenue streams. Frost & Sullivan, in its report, Meetings Around the World: Charting the Course of Advanced Collaboration, found that 71 percent of Fortune 500 companies surveyed said they use UC solutions to cut the need for business travel. The same report also found that more than half of those responding thought UC solutions presented a powerful alternative to in-person office visits.

> ompanies requiring UC entrust their mission critical worldwide telecommunications to one of a few global companies. There are a plethora of complex

issues looming for any company that relies on worldwide telephone numbers and IVR platform installations. These issues negatively impact customer retention, customer service, sales, reservations, corporate image, and revenue. Avoiding them at all costs is essential. Setting up global sales and customer service telephone numbers and IVR platforms is complicated and costly. They are the business's lifelines for customers and employees. Being 100 percent sure that they are operational is imperative.

A First Financial Training Services survey reported that 96 percent of unhappy customers don't complain. However 91 percent of those will simply leave and never come back. A Gartner survey showed 85 percent of customers were dissatisfied with their telecommunications experience with 92 percent of all customer interactions occurring via telephone.

Inadequate testing

When new worldwide telephone numbers and IVR platforms are delivered to global businesses, they are tested randomly, at best, by the provider, or their local in-country telco partner. However, these tests do not verify all numbers being delivered, and the testing is rudimentary. These companies solely and sporadically test electronically, which permits problematic and/or non-functioning numbers and IVR platforms to be delivered to customers. This testing cannot detect ANY in-country call quality or quality of service (QoS) issues, and most importantly, does not simulate the in-country user experience.

It is because of the flawed limited relationships between worldwide UC companies and their in-country local telco partners that global companies are losing clients and compromising sales because their newly delivered worldwide telephone numbers and IVR platforms are faulty. Customers calling to inquire about and/or purchase services, products, and make reservations cannot do so because of problematic telephone numbers and IVR platforms. The time and money spent to fix faulty worldwide telecommunications is costly and frustrating, but more importantly, negatively affects how a company is perceived in the marketplace, creates a poor customer experience, and undermines customer retention.

It is imperative for customer experience, retention and revenues to simulate the in-country user experience by in-country quality assurance testing before delivery to global businesses. This ensures that all worldwide telephone numbers and IVR platforms are functioning properly.

According to Global Telecom Testing's 2015 Pass/Fail Report of Worldwide Telephone Numbers, more than 33 percent of worldwide telephone numbers and IVR platforms tested are non-operational upon delivery to global businesses, even though the UC company and/or their local in-country telco partner have stated otherwise. The risk of relying on these companies to ensure that worldwide telecommunications are operational is much like playing Russian Roulette with your business' lifelines.

For global companies whose day-today business operations depends on successful customer experiences and worldwide collaboration (conferencing, calls, faxes, etc) it is imperative that their worldwide telephone numbers and IVR platforms are fully operational and can deliver consistent robust, and positive results. Completed calls and the in-country caller experience needs to be the priority; not the cost of testing - you get what you pay for. However, completed calls and the customer experience clearly isn't their priority.

In-country testing essential

The first step to fixing problems is discovering them. In order to 100 percent verify that worldwide telephone numbers and IVR platforms are operational in any worldwide city, incountry, live landline and mobile test calls must be performed in those cities/ locations. This type of testing identifies problems before customers and



employees begin using the numbers and IVR platforms, which ensures businesses are successful.

In-country live testing not only locates any non-operational worldwide telephone numbers, but also ensures that they are problem-free, the message is correct, language and dialect is correct, voice and DTMF prompts are working, and that IVR platforms are functioning properly. The reliability of worldwide telephone numbers and IVR platforms are enhanced which in turn drives customer satisfaction, and retention.

In-country live test calls are the most important testing benchmarks because only this type of testing accurately simulates the in-country user experience by detecting call failures, call quality, IVR platform installation errors, and QoS issues.

Worldwide in-country testing performed by human testers guarantees accuracy at a level that cannot be achieved through computerized and/or electronic testing.

Steve Levenson is vice president of Global Telecom Testing (GTT), a company founded in 2007 specifically to address the lack of worldwide in-country live telephone number and IVR platform quality assurance testing for global companies. It is the only company in the world that in-country tests and simulates the user experience with over 800 local testers in 200 countries and territories. GTT enables clients to establish a local presence and a highly reliable testing environment by leveraging the world's largest global footprint. Customers gain a universal understanding of their in-country user experience enabling them to make actionable corrective decisions with measurable RoI, and collaborate on those decisions both internally and with telecom carriers. Each year GTT tests over 50,000 numbers performing 100,000+ test calls along with user acceptability testing of over 600 worldwide IVR platforms and 400+ mobile apps & games.

Billions missing out on comms technology's benefits

WORLD BANK

new World Bank report says that while the internet, mobile phones and other digital technologies are spreading rapidly throughout the developing world, the anticipated digital dividends of higher growth, more jobs and better public services have fallen short of expectations, and 60 percent of the world's population remains excluded from the ever-expanding digital economy. According to the World Development Report 2016: Digital Dividends, the benefits of rapid digital expansion have been skewed towards the wealthy, skilled and influential around the world who are better positioned to take advantage of the new technologies. In addition, although the number of internet users worldwide has more than tripled since 2005, four billion people still lack access to the internet.

The report finds that, although there are many individual success stories, the effect of technology on global productivity, expansion of opportunity for the poor and middle class, and the spread of accountable governance has so far been less than expected.

To deliver fully on the development promise of a new digital age, the World Bank suggests two main actions: closing the digital divide by making the internet universal, affordable, open and safe; and strengthening regulations that ensure competition among business, adapting workers' skills to the demands of the new economy, and fostering accountable institutions—measures which the report calls analog complements to digital investments.

\$450b needed to connect an unconnected 1.5 billion

WORLD ECONOMIC FORUM

A new global dialogue focused on getting the next 1.5 billion unconnected people online was forged at a special session of the UN Broadband Commission for Sustainable Development held at the World Economic Forum in Davos in January. A new discussion paper developed by ITU as a contribution to the work of the Commission presented at the session estimates that it will take global investment of \$450 billion in network infrastructure to connect the next 1.5 billion unconnected people worldwide.

The session culminated in the release of a joint statement by the group: Working Together to Provide Internet Access to the Next 1.5 billion by 2020. The statement notes that only 3.2 billion people are currently online, while 4.2 billion people remain offline. In the 48 UN-designated least developed countries, Internet penetration is less than 10 percent, falling to under two percent in six of the world's most disadvantaged nations.

The Joint Statement pledges a concerted global effort to connect 60 percent of the world's people to the Internet by the year 2020, in line with ITU's Connect 2020 Agenda agreed by the organization's 193 Member States in 2014.

BT launches global SD-WAN



BT has launched, globally, BT Connect Intelligence IWAN a service that integrates the Cisco Intelligent WAN (IWAN) into the BT Connect portfolio of network services. It is billed as "an innovative managed service that enables organizations to automatically route and optimize network traffic and gain visibility of applications performance without spending more on bandwidth."

According to BT the service uses a hybrid environment and managed software

defined wide area network (SD-WAN) to reduce the cost of customers' networks whilst securing the performance of applications. Walgreens Boots Alliance's businesses in the UK and in around 20 other countries are set to be some of the first BT Connect Intelligence IWAN customers, taking advantage of the service's reach and scalability to support their international operations.

The first version of Connect Intelligence IWAN will offer:

- Virtual private network (VPN) capabilities across globally dispersed sites and different transport technologies, enabling organizations to reduce costs by securely interconnecting remote sites over hybrid network options such as MPLS VPNs, private and public internet, and mobile, and to transfer information using powerful encryption technology;

- Enhanced application visibility and analytics via centralized, user friendly reporting, giving customers deep insight into their application and network performance.

BT says it sees IWAN as one of the key stepping-stones for customers when transitioning to future network function virtualization (NFV) and SDN capabilities. BT is also working to provide customers with a comprehensive self-service capability to control their SD-WAN via BT's My Account portal.

Ericsson teams with China Mobile to research 5G



Ericsson and the China Mobile Research Institute (CMRI) have signed a MoU to collaborate on 5G research and development.

China Mobile, the world's largest mobile operator by number of subscribers, is accelerating investments in both 4G LTE rollouts and 5G initiatives. Under the terms of the MoU, which will initially cover a five-year period, Ericsson and China Mobile will cooperate in the following areas:

- 5G radio technology: verification, trial and standardization of a new 5G air interface for commercial deployment from 2020;
- Architecture evolution towards 5G: including close interworking between 5G and the evolution of LTE, as well as innovative RAN features to support future industrial use cases;
- Internet of Things (IoT): demonstration, verification and trial of narrowband IoT (NB-IoT) for massive machine-type communication, as well as collaboration on corresponding vertical use cases;
- Joint research and standardization efforts toward global alignment on 5G;

• Global knowledge- and experiencesharing by Ericsson.

Chris Houghton, Head of Region North East Asia, Ericsson, said: "With commercial implementation expected from 2020, Ericsson's 5G research is coming out of the labs and into live test networks, both in our headquarters in Sweden and in collaboration with our operator partners in Northeast Asia, North America and Latin America.

CMRI Deputy Head, Yuhong Huang, said: "We feel that closer and more active cooperation between Ericsson and China Mobile will foster tangible results in 5G by helping to drive standardization, research and development, and creating an integrated, cross-industry ecosystem."

KDDI backs Ossia wireless charging technology



Ossia, the company behind the Cota remote wireless charging technology, has partnered with KDDI to deliver the benefits of remote wireless power technology to KDDI's customers.

Ossia claims that Cota is unique because it is capable of charging

mobile and battery-powered devices automatically, without users plugging them in or placing them on a charging pad. The Cota unit is about the size of a small PC tower and uses patented smart antenna technology to deliver targeted energy to devices at a distance, around corners and over obstacles without requiring a direct line of sight.

According to Ossia, KDDI quickly recognized Cota's potential and became an early investor in Ossia via the KDDI Open Innovation Fund and has worked closely with Ossia to engineer new products and solutions that will help usher n the wireless power technology revolution. The companies' collaborative development efforts are being showcased at the CES 2016 event in Las Vegas.

Ossia says it is exploring many commercial and consumer applications for its wireless charging technology and is working with a number of investors and product developers.

Ayla Networks And Changhong To Build Connected Air Conditioners

ØAyla

IoT platform company Ayla Networks has teamed up with Chinese home appliance maker Changhong to launch a new generation of connected air conditioners tha will allow Changhong to perform overthe-air (OTA) updates of software.

Ayla Networks will provide IoT cloud technology and cloud platform support

for Changhong's split air-conditioning products worldwide, and Changhong will also make use of Ayla technology to create smart air-conditioning products in regions outside China.

Ayla has established IoT clouds operating from data centers in North America, China and Europe. It says that, by using its IoT platform, Changhong and other home appliance manufacturers can easily solve a series of challenges faced by smart product exports, such as adaptability to local market laws and regulations; docking with the local cloud; insight into the local market, user experience and habits; better understanding of the capabilities and costs of operating cloud services in the local market; and improved time to market for the launch of new connected products.

JianBin HE, vice general manager of Changhong air conditioner overseas marketing center, said: "Although this agreement with Ayla mainly covers Changhong's air-conditioning business, the cooperation may be extended to more areas and may result in more indepth and extensive cooperation in the future." Ericsson names new strategy chief for SE Asia and Oceania.



Håkan Eriksson, previously head of Ericsson Australia and New Zealand, has been made head of strategy for South East Asia and Oceania. Ericsson estimates that, by the end of 2015, South East Asia and Oceania will have more than one billion mobile subscriptions, about 13 percent of the global market. Three countries in this region, Myanmar, Indonesia, and Bangladesh, recorded among the top-ten highest net additions globally for mobile subscriptions in the third quarter 2015.

Eriksson said: "Many customers are looking to expand breadth of coverage in rural areas and upgrade networks to improve efficiency. Whilst others are looking to address densification in rapidly urbanizing cities, building services on advanced high speed networks or exploring opportunities to transform their business with network function virtualization and cloud based capabilities."

IIC appoints its first president from APAC



The International Institute for Communications (IIC) has elected Chris Chapman, the CEO of the Australian Communications and Media Authority (ACMA) as its new president. He has been on the board of the IIC since 2014 and succeeds Fabio Colasanti, whose second term ends in March. Chapman is the first IIC president to come from the Asia Pacific region in its 46 year history. The IIC said his appointment was "a reflection of that region's growing importance, with advances particularly noted in technical innovation, manufacturing capability and policy development."

Chapman said: "Having worked with the IIC for a number of years now, I well understand the unique role that it fulfills. As the industry becomes more globalized, and the legislative and regulatory challenges become greater, the importance of the IIC as an independent platform for knowledge and debate is only going to increase. It's vital that the IIC influence extends as broadly as possible, and particularly into the Asia Pacific region, something I'm absolutely committed to achieving."

Revector hires COO and CFO for Asia Pacific expansion



Mobile anti-fraud and revenue protection specialist Revector has appointed two c-level executives as part of its expansion into the Asia-Pacific region. Paul David joins as CCO and Keith Wilson as CFO. David ioins Revector from Urban Wimax. now Lminet Data, where he lead the sales transformation to managed services during the company's rebrand. Wilson was CEO of Dhiraagu Maldives and has spent the last ten years setting up mobile virtual network enablers (MVNEs), launching mobile virtual network operators (MVNOs) and running wholesale telecommunications businesses.

Revector claims to create products and services that enable telecommunications companies to quickly and effectively counter fraud. It says is products have enabled mobile network operators to remove millions of dollars worth of fraudulent activity from their networks.

NTT Com Security names new APAC VP



Global information security and risk management company NTT Com Security (formerly Integralis) has appointed Raymond Teo as Asia regional vice president. He will be responsible for planning and executing NTT Com Security's APAC strategy, with a focus on developing its capability in managed and professional services business in the region. He was most recently managing business development and field operations for NTT Com subsidiary Dimension Data's security business unit in Asia Pacific. Japan and China. He will be based out of Singapore, reporting to NTT Com Security CEO, Frank Brandenburg.

His appointment coincides with the opening of NTT Com Security's new sales office in Singapore, which will be located alongside the company's existing Global Services Secure Operations Centre.

ShoreTel gets new APAC channels and marketing director



IP phone systems and unified communications systems provider

ShoreTel has promoted Ben Swanson to be channels and marketing director, Asia Pacific, based in Singapore and reporting to the VP of Asia Pacific, Frederic Gillant. The company says it plans to invest additional marketing resources across the APAC region to build its channel pipeline throughout the theatre. Prior to taking up his new role, Swanson was responsible for ShoreTel's expansion across Asia Pacific, including recruitment of distributors and partners and the migration of direct channels to a distribution model.

Kathrein opens Singapore office



Global antenna manufacturer, Kathrein, has opened a new office in Asia-Pacific, in Singapore, for regional business and sales management, headed by Ashwini Bakshi. Kathrein says it sees attractive business potential in the region and that to fulfill customer requirements in the best possible way it will add specific solutions for the region to its portfolio. Bakshi has worked in communications since 1995. He has held positions at Nokia, Nokia-Siemens Networks and most recently at Ericsson.

F5 Networks boosts ASEAN sales team



F5 Networks has appointed Vishal Singh as regional vice president for sales for the ASEAN region, based in Singapore and reporting to Emmanuel

Bonnassie, senior vice president sales for the Asia Pacific region. Bonnassie said: "Global demand for application services is growing significantly as a result of the proliferation of apps, causing changes to enterprises' architectural infrastructure. F5 has established itself as a market leader in application services to enterprises in this region." Singh was most recently vice president, sales (network & software) in ASEAN and ANZ for Oracle Communications global business unit.

Commvault eyes growth opportunities in APAC



Data protection and management specialist, Commvault, has appointed Owen Taraniuk as vice president of Asia Pacific and Japan. He was most recently vice president of Asia Pacific and Japan for EMC2's Enterprise Content Division, and before that the founder of several ventures in IT and B2B. Ron Miiller, Commvault's senior vice president of worldwide sales, said: "He comes at a time of unprecedented opportunity for Commvault, particularly in the Asia Pacific region with key emerging markets, burgeoning strategic alliances and technology development hubs."

ESET recruits security guru for regional role



Information security expert, Nick FitzGerald, has joined security software developer ESET as a senior research fellow. He will work with ESET Australia, but focusing on the Asia-Pacific region.

FitzGerald rose to prominence as the editor of Virus Bulletin (1997-1999) where he established the methodology for VB100 certification and ran the first VB100 tests. Since leaving his editorial position he has worked as a consultant and researcher for several companies in the IT security industry.

He still works with Virus Bulletin as a member of its advisory board.

Magna Systems names new CEO



Australia based Magna Systems and Engineering has appointed telecoms specialist Dr Heinz Herrmann as group CEO, responsible for the company's operations throughout Asia Pacific. The company said his appointment would support its growth in the broadcast, telecommunications, government and emergency services industries across the Asia Pacific region.

Executive chairman, Robert Clemesha, said Herrmann's appointment was a major coup. "As the broadcast and telecoms worlds converge, there are not many CEOs with experience in both industries and a track record in strategy as well as execution. I'm delighted to say that Heinz is one of that rare breed."

Magna has offices in in Australia, New Zealand, Hong Kong, Singapore and Indonesia.

December 2016

Telecom Review Summit 'Its all about Networking' 2016



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