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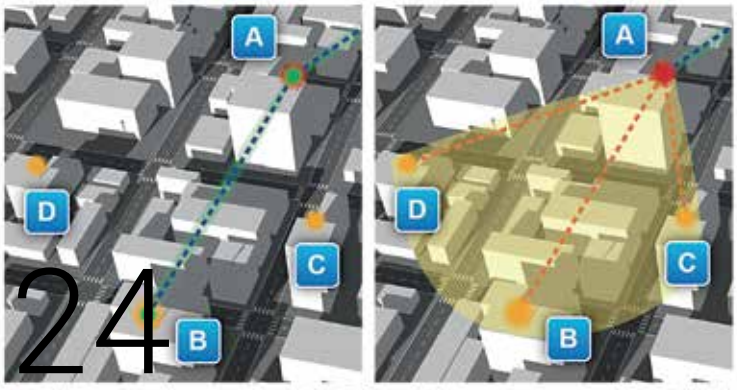

Fig.1: First customer is connected with PtP (left) and subsequent customers with PtMP (right)

Qualcomm on the future of the mobile industry

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OpenStack stacks up backers for Asia

The OpenStack Foundation, the organization created to promote the OpenStack open source cloud software, staged a sell-out conference in Tokyo in late October. Attendance was limited by the capacity of the venue and far exceeded the foundation's last Asia summit, in Hong Kong in 2013, which drew 3,500 attendees. It also exceeded numbers at the Paris summit a year ago.

It was the latest indication that the open source cloud platform is rapidly gaining traction in the region.

The event was the occasion for a couple of major users to reveal the scale of their OpenStack deployments. GMO Internet Group, a global internet services provider based in Tokyo, revealed that it had four OpenStack-based cloud/hosting products, running on over 1,400 compute nodes, available in four global geographies and used by over 15,000 customers. NTT Communications uses OpenStack to support a web portal with over one billion page views and 170 million unique users per month, and an email platform carrying 170 million messages per day.

At the event Mirantis, the provider of a distribution of the OpenStack open cloud infrastructure software, and UCloud, China's largest independent public cloud provider, announced a joint venture, UMCloud, to accelerate uptake of OpenStack by finance, telecom, stateowned enterprises and large internet businesses in China.

Mirantis co-founder, Boris Renski, was reported saying: "We see China as an extremely important market for OpenStack, second to the US. One might argue that it might be even more important long term than the US itself, due to China's current embrace of open source."

He added: "Most of the government-affiliated institutions in China, which are a very significant portion of the China economy, are now moving onto the open-source path, and OpenStack is quickly gaining momentum as the default fabric for doing that replacement."

Back in December 2014 Forrester analyst Frank Liu was tipping OpenStack uptake to accelerate in China in 2015, on the back of a The Ministry of Industry and Information Technology (MIIT) declaring its intention to support OpenStack ecosystems and encourage state-owned enterprises to use OpenStack-based cloud products.

Developments this year in the leadup to the Tokyo summit have certainly supported his predictions. The APAC region is now home to 18 OpenStack user groups, The OpenStack Days Japan event in February was double the size of the same event in 2014 with 2000 attendees. OpenStack Day Korea was a sell-out. In August attendance at OpenStack Day India was up 150 percent on 2014 and 1,700 people participated in OpenStack Day Taiwan, where more than 200 companies have started proof-of-concept projects or are building dedicated OpenStack teams.

According to the OpenStack Forum: "China, which has long been a leading contributor to the project, boasts numerous large-scale deployments, including multiple Internet vendors who use OpenStack on a daily basis to support hundreds of millions of customers."

With the amount of momentum already built up, expect plenty of Asian developments around OpenStack in 2016.

Stuart Corner
Senior Editorial Manager
Telecom Review Asia Pacific

Ericsson partners with Dialog for offer cloud services in Sri Lanka

Ericsson and Dialog Axiata, Sri Lanka's largest telco, are partnering to offer managed enterprise cloud services to Sri Lankan businesses. Ericsson will install and integrate the managed enterprise cloud framework in Dialog's data center and manage it remotely via Ericsson global service centers. Dialog Axiata customers will access the shared enterprise services via a secure web portal.

Ericsson and Dialog will launch the first managed enterprise cloud, with a suite of business applications available as a service to enterprises in Sri Lanka. At launch these will include an e-mail server, a web client, a content management framework, a customer relationship management system and a content management platform integrated and accessed via a single interface.

Ericsson said: "With managed enterprise cloud, Dialog will be able to serve all of its enterprise customers and consolidate other third-party application offerings with one unified platform, enabling efficient provisioning and significantly improved time to market."

Mirantis teams with UCloud to push OpenStack in China

Mirantis, the provider of a distribution of the OpenStack open cloud infrastructure software, and UCloud, China's largest independent public cloud provider, have formed a joint venture, UMCloud, to accelerate uptake of OpenStack by finance, telecom, stateowned enterprises and large internet businesses in China.

UCloud CEO and founder Xinhua Ji will lead the joint venture, which will be headquartered in Shanghai. He said: "Mirantis is the open cloud technology leader with deep and rich OpenStack deployment success over many years in many different enterprise production environments. As the largest independent public cloud service provider in China, UCloud deeply understands customer requirements for cloud computing in China. Our combined strength will allow UMCloud to become the foundational technology provider for China's Internet Plus Initiative, providing the most reliable, secured, and stable OpenStackpowered cloud service to China enterprises."

Mirantis claims to have delivered successful OpenStack implementations to some of the world's largest cloud customers, including AT&T, Ericsson, Walmart and Wells Fargo. The company is one of the top two open source software code contributors to OpenStack and has raised nearly a quarter of a billion dollars in private investment since 2012.

Alcatel-Lucent to manage Chorus' NZ copper and fiber networks

Alcatel-Lucent has been awarded a five year managed services contract by New Zealand telco Chorus under which it will deliver 24 x 7 monitoring and analysis of Chorus' nationwide copper and fiber wholesale networks.

Alcatel-Lucent said that, as a result of the agreement, it would "transform Chorus' network operations from legacy systems and processes to the latest proactive and real time monitoring and analysis tools to ensure the delivery of consistently high service quality for customers."

Services will be provided from a new network operation center in Hamilton, New Zealand with a staff of 40 that will work closely with Alcatel-Lucent's global network operations center in Bangalore.

Alcatel-Lucent said it would use new toolsets and processes to perform real-time monitoring and analysis of the networks – including proactive correlation of network events – to prevent network issues and improve network availability.

Chorus, formerly part of Telecom New Zealand, owns New Zealand's nationwide copper network infrastructure and, in partnership with the New Zealand Government, is deploying a fiber network that will deliver broadband to 830,000 homes and businesses – including those in Auckland, the country's largest and most populous city.

Alcatel-lucent is already a supplier of fixed broadband access technology for the Chorus fiber network, and has also deployed its 7950 Extensible Routing System to support the 'Chorus Accelerate' program. The company will also continue to provide professional services including design and integration services as the network is transformed.

Nokia commits to supporting Ooredoo

Ooredoo Group and Nokia have signed a five year framework agreement under which Nokia will support Ooredoo's long-term development strategy across its footprint in the Middle East, North Africa and Southeast Asia.

Nokia will provide advanced mobile broadband technologies and professional services to help Ooredoo Group support 2G, 3G, 4G and LTE-A networks to offer voice and data services for its customers across its range of mature and emerging markets.

The deal represents the renewal of a previous agreement, but the two say the terms and conditions have been revised to include global best practices in terms of delivery and technology for the benefit of both companies.

Ahmed Al Derbesti, COO of Ooredoo Group, said: "This renewed framework agreement is significant as it covers the delivery of all the latest technologies and support services helping us further enhance our network capacity and coverage."

Ashish Chowdhary, executive vice president and chief business officer, Nokia Networks, said: "With our latest innovations we will support Ooredoo to prepare for the huge data demand, and provide high-speed data services with improved network coverage, in addition to clearer voice call services to ensure the ultimate personal gigabyte experience."

SK Telecom and China Unicom co-operate on 5G, roaming and startups

SK Telecom has signed a MoU with China Unicom designed to strengthen both companies' competitiveness in the telecommunications industry and promoting new growth businesses. The two will work together in 5G technology, international roaming, platform and startup support to enhance customer benefits and lead the development of the overall ICT industry.

They plan to share information and conduct joint studies to promote standardization and commercialization of 5G. They will also work together to launch competitive roaming services that deliver greater benefits to their subscribers.

SK Telecom said that, given the active tourism exchange between Korea and China, the cooperation between the two companies would make roaming more convenient and affordable for travelers. (According to the Korea Tourism Organization, 6.13 million Chinese visited Korea, and 4.18 million Koreans visited China in 2014.)

Through the MoU, SK Telecom and China Unicom will also share information on their platforms, including platform-related products/services and OTT services, and work together to create market opportunities. SK Telecom said it expected to gain a valuable opportunity to introduce its next-generation platforms to the Chinese market.

The two also agreed to cooperate in building a startup ecosystem. They will create a cooperative venture incubator program to jointly conduct the overall process of incubation from search for venture items to their market introduction.

Hanoi Telecom selects Infinera for metro network upgrade

Hanoi Telecom has selected Infinera TM-Series for its metro network connecting Ho Chi Minh City and Vung Tau. According to Infinera, it is the first selection of Infinera's TM-Series by an existing Infinera customer post the acquisition of Transmode, which closed on August 20, 2015.

Hanoi Telecom offers carrier and wholesale services, focusing primarily on providing wireless, wireline Internet and VoIP services, and mobile services under Vietnamobile to more than 13 million wireless subscribers.

According to Infinera, its TM-Series provides multi-service capabilities including services such as Ethernet/CE2.0, MPLS-TP and OTN aggregation, and is well-suited for mobile fronthaul and backhaul, and metro aggregation applications.

"Infinera worked closely with partner Nissho Electronics Vietnam, an end-to-end network system integrator, to select the carrier-class solutions enabling HTC to rapidly respond to its customers' needs," it said. "The Infinera TM-Series solves HTC's new requirement for an optimized 10G transport solution upgradeable to 100G, including 1+1 protection, high density, low power and space savings."

The Infinera TM-Series will support metro applications where high density, low power and bandwidth scalability are critical.

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.

Mobifone brings Wi-Fi calling to Vietnam

Vietnam telco, MobiFone Corporation, has become the first telecommunications services provider in Vietnam to launch a Wi-Fi calling service. To support the service, named WiTalk, MobiFone is using Taqua's Virtual Mobile Core (VMC), and mobile client to enable Wi-Fi Calling on Android smartphones that do not have native dialer support for Wi-Fi calling.

The service enables MobiFone subscribers to make phone calls and send text messages over any Wi-Fi network in the same way as they do when using the standard cellular network. As a result, subscribers can receive high quality voice and messaging services in the places they spend most of their time, such as at home and the office.

Taqua says its approach to Wi-Fi calling is transparent to subscribers as it enables them to continue using the native dialer app, contacts app, call history and voice mail on their handset when connected to Wi-Fi or the cellular network.

To activate the new WiTalk service, MobiFone subscribers can download WiTalk by MobiFone from the Google Play Store. Also, when traveling out of country, MobiFone subscribers can text and make calls over Wi-Fi networks with lower call tariffs, rather than using regular international roaming services. In addition, these traveling MobiFone subscribers will not be charged for receiving calls by using WiTalk.

Qualcomm addresses the future of the mobile industry

Qualcomm International arranged a partner event in Dubai on November 19 to discuss China's impact on the mobile industry, its 5G vision and the internet of everything (IoE). With a broad range of speakers and delegates, the event provided an interesting insight into the evolution of the mobile industry.

This year, Qualcomm celebrates eight years of establishment in Dubai. The hugely successful technology provider established a base in Dubai in order to reach out to the surrounding Gulf Cooperation Council (GCC) region. The mobile industry is experiencing fast growth in the GCC, particularly in Dubai, which aims to be a smart city. Mobile data traffic in the Middle East and East Africa is expected to expand more than 14 times between 2014 and 2020, according to Qualcomm – nine times higher than the global growth rate.

With this sort of growth, it's easy to see why Qualcomm has taken such an interest in the region. Qualcomm predicts that mobile subscriptions in the region will grow at a compound annual growth rate of six percent to 2020, to 970 million.

The GCC, like all regions, is highly impacted by key players in the industry. One country in particular, has dominated mobile phones, along with just about every other industry due to its massive population and cheap manufacturing costs. Jay Srage, Qualcomm president of MEA and SEA, provided an insight into China's dominance over the mobile industry.

From January to June 2013, China exported 527 million mobile phone units, a year on year increase of 15.2 percent and the related export value was $US41.55 billion, a year on year increase of 16 percent. According to the Ministry of Industry and Information Technology of China, during the first half of 2013, China's mobile phone output and export both saw increases, especially the mobile phone exports that reversed the situation of slow growth in previous years.

More than half of all devices will be from China in the future. Regardless of China's dominance over the mobile industry, there is still a lot of room for other regions to grow. Big mobile players are delving into other products that have been introduced by OEMs. The dynamics are changing and "it's not just about mobiles anymore," says Srage, referring to devices such as smart cars and smart watches.

Dubai Internet City (DIC), for instance, has partnered with Qualcomm to develop a potential smart city, where innovative technologies could be implemented to make life better for residents, which will then ultimately improve the UAE's productivity and development as a country. One of the ways that could significantly

boost productivity in all regions is the introduction of the much anticipated 5G network, expected to be introduced by 2020.

Qualcomm's 5G visions

To support the expanded connectivity needs for the next decade and beyond, Qualcomm's vision for 5G is more than higher data rates and the addition of new spectrum. 5G is envisioned to be a unified platform for all types of spectrum and bands, from low bands below 1 GHz to emerging higher bands like mmWave, supporting new kinds of services and connecting a wide range of consumer and enterprise devices, while offering opportunity for new deployment, subscription, charging and business models. A key enabler is a unified air interface design that is scalable and adaptable across all these spectrum and service types.

According to Qualcomm, realizing the 5G vision will require new levels of intelligence and integration on devices, access nodes, machines and things. Inspired by the human brain and senses, Qualcomm is inventing cognitive technologies to create a world where devices and things can see, hear, perceive, anticipate our needs and act intuitively.

In addition, Qualcomm is working on enhancements to 4G that will bring new capabilities far beyond what is possible today. It is expanding LTE Advanced and its successor LTE Advanced Pro in the same transformational path envisioned for 5G. Multimode devices and simultaneous 5G, 4G and WiFi connectivity will allow for a seamless and phased 5G introduction. What's more, 5G's single core network is envisioned to support 4G and WiFi access, ensuring that operators' current and future investments are protected.

Internet of everything

For some time now, we have gradually been introduced to the idea of the IoT. Yet, the definition of IoT isn't exactly crystal clear. Why? Because the concept is still in its infancy. To understand it, we first have to look at the evolution of mobile, which is now the world's largest technology platform with over seven billion connections, with a thriving ecosystem of developers and highly optimized and integrated connectivity and computing technologies.

With wireless and mobile technologies having revolutionized the way humans communicate, the industry is now preparing for a new phase of growth, in which tens of billions of devices, machines and things will be connected wirelessly to the cloud and each other. This new era of hyper-connectivity has been labeled internet of things, and since it is still a very young concept, exponential growth over the next few years will bring exponential complexity. Therefore, Qualcomm believes this requires a scalable, intelligent and converged connectivity fabric to handle the extreme variations and requirements of IoT. Calling the concept internet of things has been challenged by some who believe it to be too vague. Therefore, Qualcomm now uses the term internet of everything (IoE), a term invented by Cisco.

According to Qualcomm, IoE is about diversity in application, solution and approach, and understanding this diversity is key to Qualcomm's strategy for addressing it. They must consider everything from automotive, to connected cameras, drones, smart homes, wearables and M2M – all with a unique mix of technology and commercialization requirements.

"The IoT space is still definitely very foggy, and a lot is being said, but very little is being done, so there are still a lot of theories going around," said Fadwa Mohanna, CEO of Markelligent, who praised Qualcomm for its contribution to her company by providing chipsets. "What is IoT? We tend to forget that IoT is still in its infancy, and a lot of work to contribute to an IoT AP system needs to be done – from the vendors' side and from the operators' side."

Clearly, IoE is still very much in establishment mode, but Qualcomm Technologies has mastered the art of platform-level integration for smartphones and is now taking a similar approach to develop IoE. Qualcomm is already delivering heterogeneous platforms for a wide variety of vertical applications, falling within three major categories which include: portable, everyday devices, products associated with smart homes and industrial-grade systems that are used by businesses, municipalities and service providers. It won't be long before Qualcomm will have mastered both 5G and IoE just in time to begin a new decade. TR

Huawei make huge Asia cloud push

Huawei staged two large events in Asia within weeks of each other recently: to promote is cloud computing services and expertise to both enterprise and telcos.

First up was the 5th Huawei Cloud Congress (HCC2015) in Shanghai l under the theme of Make IT Simple, Make Business Agile, which attracted more than 10,000 attendees from over 80 countries.

Introducing the event, Huawei's rotating CEO, Eric Xu, said: "We will focus on IT infrastructure, software platforms and enterprise cloud services when creating a cloud ecosystem. We will create a cloud ecosystem with business cooperation at its core and technical partnership and talent development as its foundation. This ecosystem will enable our partners to jointly expand the industry size and achieve mutual success."

Huawei's chief strategy marketing officer, William Xu, said: "In the coming years, Huawei will develop a leading cloud operating system (OS), big data platform and PaaS platform by combining our technical strengths with those of our partners. Together, we will create an open and dynamic cloud ecosystem. … Alongside our partners, we will create an open cloud ecosystem to achieve co-existence. In addition, we will make box products more agile and platforms more open."

That event was followed by Huawei's 2015 Innovation & Transformation Summit in Bali at which the company debuted its 2015-2016 Digital inCloud program, aimed squarely at telco service providers.

Digital inCloud is a set of products and technologies from Huawei designed to make it easy for telcos to take digital content and services from the creators and providers of those services and make them available through their networks.

According to Huawei "Digital inCloud will help telcos to shape a digital service ecosystem and generate more revenue from digital services … By connecting to Huawei global distribution network, partners' digital services and contents can be instantly deployed to telcos' networks and available to end users."

At the event Huawei unveiled a number of enhancements to Digital inCloud that it said would facilitate ease of distribution and trade between consumers, carriers and providers of digital content and services through "improved content aggregation and

better management of local and global digital content."

New products at HCC2015

At HCC2015 Huawei unveiled three key software platforms — FusionSphere 6.0, FusionInsight and FusionStage — and a new data storage platform, OceanStor DJ.

According to Huawei FusionSphere 6.0 is tailor-made for enterprises and operators. "FusionSphere 6.0 embraces open source at the component, architecture and ecosystem levels. With fully open software, this software platform is flexible enough to meet the needs of different customers."

Huawei claims to already have more than 1,000 customers across over 80 countries and regions: in the government, public facility, finance, telecom, energy, transportation, minerals and energy and manufacturing sectors. "Thanks to FusionSphere, these customers have been better able to transform their IT systems and thus achieve business transformation and success," it says.

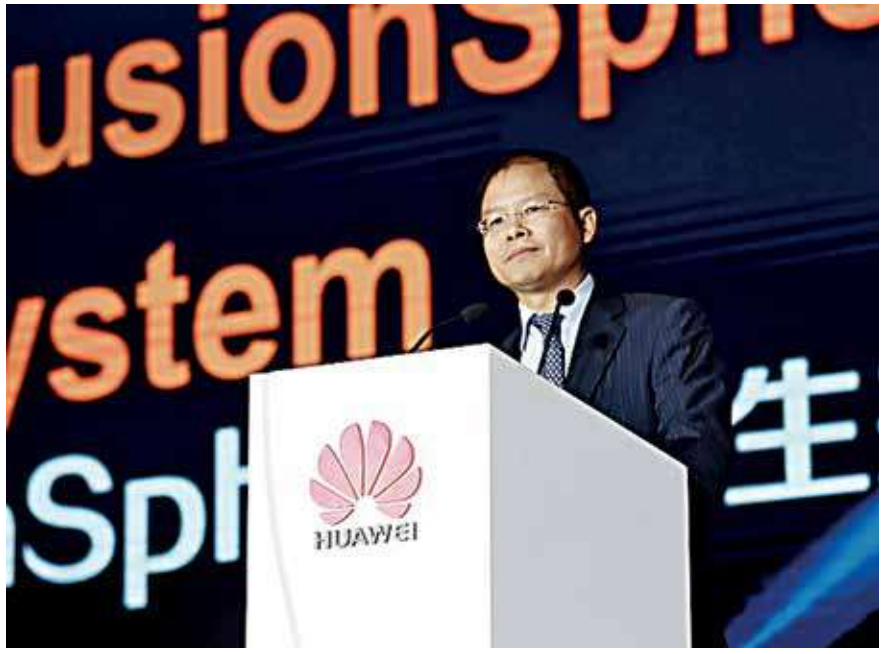
Leif Zheng, president of Huawei's IT Product Line, said: "Alongside our partners, Huawei facilitates customer transformation via cloud technologies and solutions. Our work touches on all levels of cloud computing, including architecture, software, hardware and services.

Through focused and unremitting efforts, we strive to help customers achieve new benchmarks in the transformation towards cloud computing."

OceanStor DJ is based on unified storage resource management and data management software. It provides data storage and management services on demand to boost data centers' operating efficiency.

Enabling the telco cloud

Also at HCC2015, Zou Zhilei, president of Huawei's Carrier Business Group, foreshadowed announcements to be made at the Innovation & Tansformation Summit, saying: "We are increasingly seeing carriers



develop their digitization strategies in three ways: continuing to lead the smart pipe business, becoming an integrated platform provider and actively participating in user application development and content creation. Cloud computing plays an important role in carriers' digital transformation as it enables carriers to transform IT from a supporting system to a production system and an enabling platform."

He added that Huawei was advocating a comprehensive cloud strategy for carriers' businesses, operations and networks, leveraging Huawei's service-driven distributed cloud data center (SD-DC2) and telco OS. "Huawei will enable carriers to realize cloud-based agile business operations and offer innovative cloud services to governments and enterprises worldwide," Zhilei promised.

Huawei debuted its Digital inCloud service for telcos at Mobile World Congress in Barcelona in March saying it already had 2000 content and service providers and almost 60 telcos on the service with more than 200,000 digital content items between them, including digital music, mobile games, video, open APIs, traffic monetization, B2B cloud and M2M services. It plans to increase these numbers to 4000+ partners 35,000+ digital services and 80+ carriers in 2016.

It said that the enhancements unveiled at the Innovation & Tansformation Summit would facilitate: ease of distribution and trade between consumer, carriers and partners of digital products/services through improved content aggregation, better management of local and global digital content.

Specifically these enhancements were:

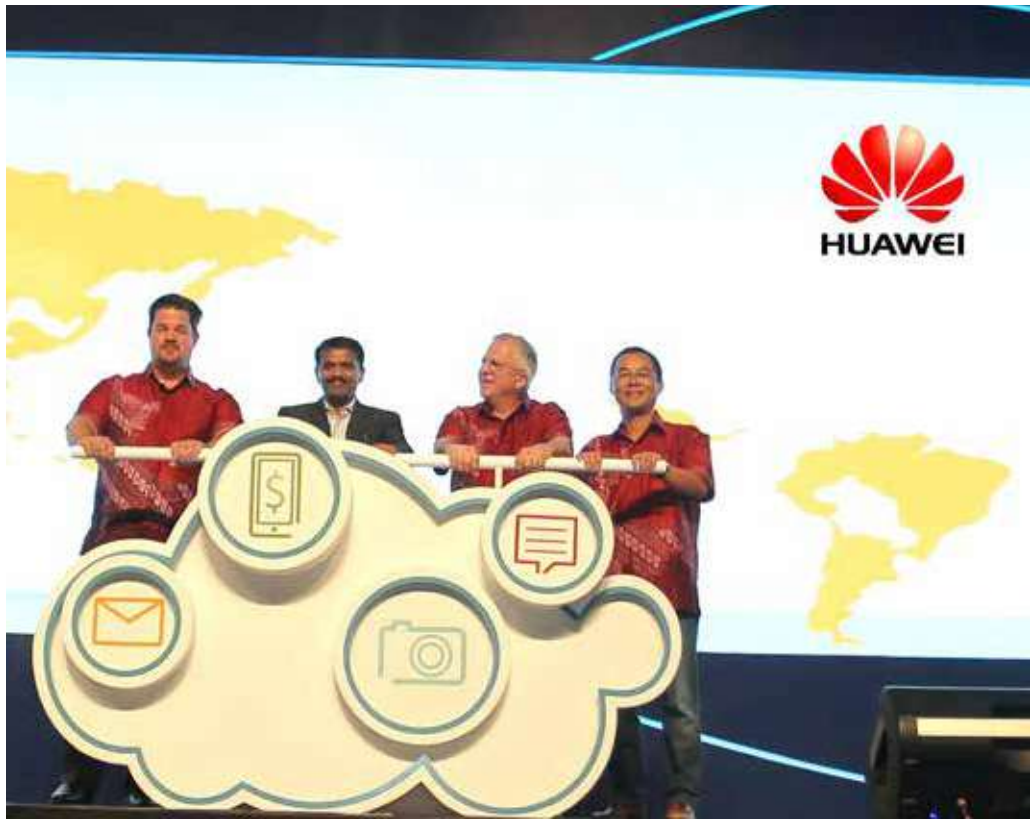
Digital inCloud telecom capability

Digital inCloud aggregates global carriers' telecom capabilities, such as payment, message notification, voice and cloud call center, and business operation analysis, creating a one-stop service to partners to achieve "one spot access to reach all". It also provides a new channel for carriers to monetize their telecoms capability. "In 2016, Digital inCloud Telecom Capability Cloud Service will complete the capability aggregation of more than 300 carriers globally," Huawei said.

Global Service Innovation Cloud (GSIC)

GSIC provides a business innovation and incubation environment for global telcos. It includes: enterprise business opportunity information from global carriers, free resource acquisition of telecom capability cloud services, fund innovation, carrier friendly user

> Digital inCloud will help telcos to shape a digital service ecosystem and generate more revenue from digital services



testing etc. "Through GSIC, partners will more easily achieve innovation, commercial launch and monetization of telecom enterprise business," Huawei said.

inTouch Partner Service 2.0

The inTouch partnership program is a matchmaking services that brings telcos together with digital content and services providers that can benefit mutually from Digital inCloud services, Huawei said it had already aggregated 2000+ partners, and provided 200K+ digital services for nearly 60 carriers. Huawei plans to take these totals to 4000+ partners, with 35K+ digital services for 80+ carriers in 2016. inTouch Partner Service 2.0 includes updates of several core capabilities, such as signing, service launching, distribution, settlement, service quality management that Huawei hopes will help it achieve these goals.

Announcements made at the summit also included a Digital inCloud Telecom Capability cloud service that gives content and service providers a 'one-stop-shop' to deliver to multiple telcos and a Global Service Innovation Cloud (GSIC), an incubation environment that content and service providers can use to prepare their services for delivery via telcos and Digital inCloud.

Cloud partners' showcase at HCC2015

There was a modest exhibition at the Innovation & Tansformation Summit where a number of content and service provider showcased the offerings that they were making available through Digital inCloud services. Much grander was the expo at HCC2015, a 1,000 square meter exhibition space where joint exhibitions and demos by Huawei and its customers and partners showed how a collaborative cloud industry ecosystem could benefit all players along the value chain.

The key showcases included a public cloud service project with Deutsch Telecom, an eGovernment cloud services offering with Zhejiang Telecom and a demonstration with JiaYing Information on how to use carriers' open network capabilities to enhance integrated communications and better serve vertical industries.

Huawei is a relative newcomer to the cloud space: it entered the cloud computing market only in 2010 but since then has invested heavily in technological R&D and product innovation, and it looks like this is paying off.

In June it was selected by Deutsche Telekom as the partner to support the carrier's cloud strategy development and in August Huawei signed a strategic cooperation agreement with China Telecom to help enhance its cloud computing and big data capabilities.

The company has already established a global distribution network for Digital inCloud with eight regional centers in China, Malaysia, Mexico, Russia, Dubai, Nigeria, Holland, and Egypt. By the end of 2015 it plans to have 12 centers that between them and its telco partners will have access to 140 million telco customers.

The focus to date has been on telcos in developing markets, and Huawei claims to have six telco customers in Asia Pacific already, but it is also active in Europe with Telefonica and Deutsche Telekom and in Latin America with Telefonica. TR

ITU to Cooperate on Standards That Advance On-Demand Connectivity Services

ITU and MEF concluded an agreement to advance the worldwide development and deployment of emerging connectivity services – designed to be agile, assured, and orchestrated – in addition to standardized CE 2.0 (Carrier Ethernet) services.

The Memorandum of Understanding was signed by the Director of the ITU Standardization Bureau Chaesub Lee and MEF President Nan Chen on the eve of the opening of ITU Telecom World 2015 in Budapest. The agreement focuses on opportunities for mutual standards referencing CE 2.0 and LSO (Lifecycle Service Orchestration), standards compliance/certification and global education as well as alignment in emerging areas, such as trust in the information society, orchestration and virtualization, as well as 5G Cloud Access.

Areas of cooperation include:

- Joint steering committee. The ITU Standardization Sector (ITU-T) and MEF will establish a Joint Steering Committee composed of two representatives from each organization that will supervise the overall implementation of the collaboration.
- Leadership workshops. The two bodies intend to organize periodic leadership workshops to focus on specific aspects of proposed collaboration relating to the adoption of ITU-T and MEF standards in the areas of Carrier Ethernet and the next generation of agile, assured and orchestrated connectivity services.
- Standards references and contributions. The organizations intend to focus on enhancing contributions to the ongoing work of relevant ITU-T Study Groups and maximizing the MEF work that can be referenced by ITU-T documents. ITU-T Study Groups expected to play leading roles in ITU-MEF collaboration include:
- Study Group 11 – protocols and test specifications
- Study Group 13 – future networks, including cloud computing, mobile, and next-generation networks
- Study Group 15 – networks, technologies, and infrastructures for transport, access, and home
- Certification and Conformance Testing. The MEF and ITU-T intend to investigate collaborative certification and conformance testing activities and promote the availability of training and certification to maximize the impact of the MEF Certified Professional program. It is a globally recognized, vendor-neutral certification program designed to ensure that organizations have a common baseline of technical Carrier Ethernet skills across many job functions. Both organizations see an opportunity to broaden the base of expertise to additional ITU Member States with the goal of promoting network-driven economic growth.

"This renewed commitment to cooperation between ITU and MEF is a very welcome development," said ITU Secretary-General Houlin Zhao. "MEF offers valuable support to ITU's standardization of Carrier Ethernet, assuring the ICT industry that well-coordinated standards development will drive the evolution of Carrier Ethernet and the emergence of integrated fixed-mobile hybrid 5G networks."

Nan Chen, President of the MEF, said, "MEF's concept of 'The Third Network' – with agile, assured and orchestrated services enabled by LSO (Lifecycle Service Orchestration) – describes a vision for the development and deployment of connectivity services necessary to build infrastructure which can be leveraged for economic opportunities that a hyper-connected world provides. Alongside ITU-T, the MEF is defining the technologies that effectively makes for a level playing field, bridges the standardization gaps, and fosters opportunities for everyone to participate in the digital economy."

"We see standardized Carrier Ethernet and standardized connectivity as a strong basis on which ITU Member States can build a large part of their sustainable economic growth over the coming decades," said Chaesub Lee, Director of ITU's Standardization Bureau. "Rapidly emerging requirements in the arenas of digital trust, Internet of Things, 5G and virtualization will be better met through rapid alignment between ITU-T and the MEF, and this in turn will translate into immediate benefits for the ITU-T membership along with more effective long-term standardization."

Odds stack up for OpenStack in Asia Pacific

The OpenStack Tokyo Summit held at the Grand Prince Hotel in Shinagawa was a sellout with 5000 attendees, testimony to the growing popularity in Asia of the OpenStack open source cloud software.

The 5,000+ summit attendees came from 56 countries and represented 736 different companies, including 86 sponsoring companies. For 50 percent of attendees it was their first summit. The top 10 countries represented, in descending order were: United States; Japan; China; India; Korea; Canada; Israel; France; Australia; Germany.

Regionally the breakdown was: Asia Pacific (46 percent); North America (38 percent); Europe 13 percent; Middle East (two percent); Latin America (one percent). Twenty eight percent of attendees were developers, 25 percent operators /users/ operations/ sysadmin. CEOs, CIOs and IT managers accounted for 10 percent.

Presenters revealed the very large scale of some regional OpenStack rollouts, particularly the four finalists for the SuperUser award. Hironobu Saitoh, technical evangelist of GMO Internet Group a global Internet services provider based in Tokyo, told the summit that GMO had four OpenStack-based cloud/hosting products, running on over 1,400 compute nodes, available in four global geographies and used by over 15,000 customers.

Japan based smartphone game developer, Aiming, supports its games on GMO Internet's OpenStack Cloud, and some of its most popular games have been downloaded several million times.

Project Navigator to smooth the OpenStack journey

At the Summit the OpenStack Foundation launched a new tool, Project Navigator, designed to give users easy-to-understand information to help them make informed decisions about how to consume the software. The Foundation also made updates to and added products to the OpenStack Marketplace. These are designed to help users more easily adopt the software.

The Foundation explained Project Navigator by saying: "With more than 25 cloud-related services or projects now under the OpenStack

umbrella, one challenge for OpenStack users has been understanding the breadth of functionality available and maturity of each of these services. Project Navigator helps solve this by aggregating important information about each project — such as maturity, release schedule, packaging and documentation support — into an easy-to-navigate interface."

OpenStack Foundation COO, Mark Collier, explained: "One of the primary reasons that the community reorganized the project into core and optional services was to simplify the process of architecting and deploying OpenStack-powered clouds. Project Navigator takes this a step further by giving users new to our community a simple, graphical presentation of core and optional project information to help them quickly make informed decisions about the components they need in their own deployments."

Project Navigator helps new users easily differentiate between core services — the six projects most commonly deployed across every OpenStack cloud — and optional services they may or may not elect to deploy, depending on their use case. Data used to power the Project Navigator website is provided by the OpenStack Technical and User Committees.

In addition to providing data about each project, the Project Navigator shows sample configurations based on real-world user case studies and white papers. These include big data, web hosting, eCommerce, high-throughput computing, public cloud and video processing and content delivery.

OpenStack foundation introduces certification

The OpenStack Foundation also announced a new professional certification program designed to provide a baseline assessment of knowledge and be accessible to OpenStack professionals around the world, as part of its strategic efforts to grow the OpenStack talent pool and global community. OpenStack Foundation executive director, Jonathan Bryce, said the first certification,

Certified OpenStack Administrator (COA), would be available in 2016.

"The Certified OpenStack Administrator is a professional typically with at least six months OpenStack experience and has the skills required to provide day-to-day operation and management of an OpenStack cloud," Bryce said.

According to the Foundation, "There are dozens of companies around the world that currently offer OpenStack training and representatives from that ecosystem across 10 countries have been involved in a community working group to help define skills and capabilities of a Certified OpenStack Administrator. In addition to helping create the test curriculum and questions for the COA program, these companies will provide training and preparation for the COA test once it becomes available."

Certification testing will be administered with the help of the Linux Foundation, which has created a virtual testing platform, making it possible to access the COA test anywhere in the world at an affordable cost. Testing for COA is expected to be available in Q2 2016."

"This OpenStack professional certification program addresses

the need for well-trained and highly qualified OpenStack administrators," said Bryce. "We expect COA certification to become a valuable credential that any hiring manager would want to see on the resume of viable candidate. Further, it is our hope that the OpenStack professional certification program will encourage new entrants into the OpenStack community and expand the talent pool within the industry."

The organisation has also just released its latest version of the software, Liberty. Bryce said: "It was our 12th release and our biggest yet. Over 2000 developers contributed and it had over four million lines of code."

Taiwan's inwinSTACK the latest Gold Member

The Foundation's board, meeting at the summit, approved inwinSTACK as a Gold Member of the Foundation. Announcing the move, the Foundation said: "Although a startup, inwinSTACK is already the largest OpenStack service integration provider in Taiwan. It serves clients in manufacturing, finance, telco, public and education markets. The company employs the largest OpenStack R&D team in Taiwan and was an early leader and organizer in the Taiwanese OpenStack community. "

It added: "inwinSTACK has organized and sponsored OpenStack Taiwan Day twice, put together the OpenStack Programming Contest with HP, trained hundreds of people on OpenStack skills, and contributed to the upstream code base, ranking among the top 12 in bug fixes, the top 10 in lines of code, and the top 18 in code commits.

OpenStack Foundation COO, Mark Collier, said: "inwinSTACK has already been an active and engaged member of the OpenStack community in Taiwan. Their team has made a big commitment to the project by organizing events and hosting training sessions, in addition to their upstream work. The board's decision to elect them our newest Gold Member reflects their community leadership and commercial success."

inwinSTACK's general manager and CTO, Minolu Chung, said: "As a Gold Member, our goal now is to lead more vendors in Taiwan to join the OpenStack ecosystem while we introduce OpenStack to more enterprises in the APAC region."

Foundation membership is limited to 24 Gold Members. The other current Gold members are: Aptira, CCAT, Cisco, Dell, DreamHost, EMC, Ericsson, Fujitsu, Hitachi, Huawei, Juniper Networks, Mirantis, NEC, NetApp, Odin, Symantec and Yahoo!.

Mirantis, UCloud push OpenStack in China

Mirantis, the provider of a distribution of the OpenStack open cloud infrastructure software, and UCloud, China's largest independent public cloud provider, announced at the summit that they had formed a joint venture, UMCloud, to accelerate uptake of OpenStack by finance, telecom, stateowned enterprises and large internet businesses in China.

UCloud CEO and founder, Xinhua Ji will lead the joint venture, which will be headquartered in Shanghai. He said: "Mirantis is the open cloud technology leader with deep and rich OpenStack deployment success over many years in many different enterprise production environments. As the largest independent public cloud service provider in China, UCloud deeply understands customer requirements for cloud computing in China. Our combined strength will allow UMCloud to become the foundational technology provider for China's Internet Plus Initiative, providing the most reliable, secured, and stable OpenStackpowered

cloud service to China enterprises."

Mirantis claims to have delivered successful OpenStack implementations to some of the world's largest cloud customers, including AT&T, Ericsson, Walmart and Wells Fargo. The company is one of the top two open source software code contributors to OpenStack and has raised nearly a quarter of a billion dollars in private investment since 2012.

The Shenzhen Stock Exchange, one of China's three main public stock exchanges, is among a half dozen early Mirantis customers deploying OpenStack clouds in China. Other recent Mirantis customer wins in China include Jigsaw, a provider of telecommunications hardware and software; Huawei and ZTE.

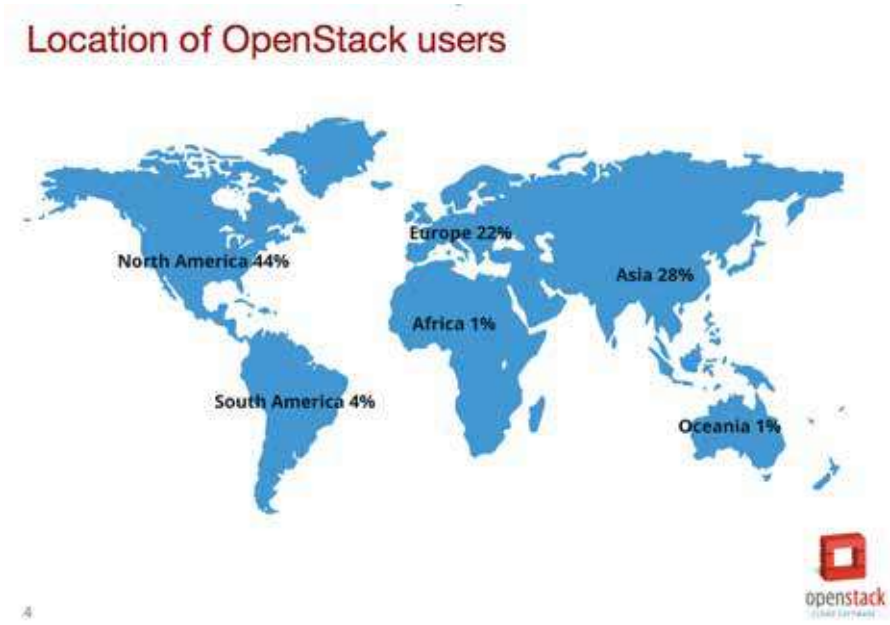
UCloud was founded in 2012 by former Tencent executives. It operates data centers in China, Hong Kong and the United States. The company announced a $100 million Series C financing round earlier this year and has raised $160 million to date.

Ericsson & AT&T virtualize telco network functions

Ericsson and AT&T demonstrated the deployment of a telco virtualized network function (VNF) in a Platform-as-a-Service (PaaS) environment integrated with OpenStack.

According to Ericsson, the proof of concept (PoC) showcased a fast and secure deployment of the virtualized Web Communication Gateway (vWCG) — a Telco VNF — in Apcera's container-based, policy-driven PaaS environment that is fully integrated with OpenStack. It showed audio and video communications between multiple web browsers using the vWCG deployed in an OpenStack-integrated PaaS environment.

Magnus Arildsson, Ericsson's head of IaaS and PaaS, said Ericsson was leading the development of both Infrastructure-as-a-Service (IaaS) and PaaS environments integrated with OpenStack for deploying VNFs on telco networks. "This demonstration showed how a complex VNF such as vWCG can be deployed using Apcera's PaaS technology with a few clicks of a mouse," he said, adding: "This is an important step toward fast, secure and policy-integrated deployment of Telco VNFs on micro-services-based containers."



Derek Collison, CEO and founder, Apcera, said the PoC would pave the way for cost-effective, efficient deployment of VNFs and further collaboration with telco operators to integrate carrier-grade requirements with Apcera's cloud platform.

NTT Com, NTT Resonant score superUser award

NTT Communications (NTT Com), the ICT solutions and international communications arm of NTT, and its subsidiary, NTT Resonant, scored the OpenStack Superuser Award at the Summit, becoming the Asia-Pacific's first recipient of the award.

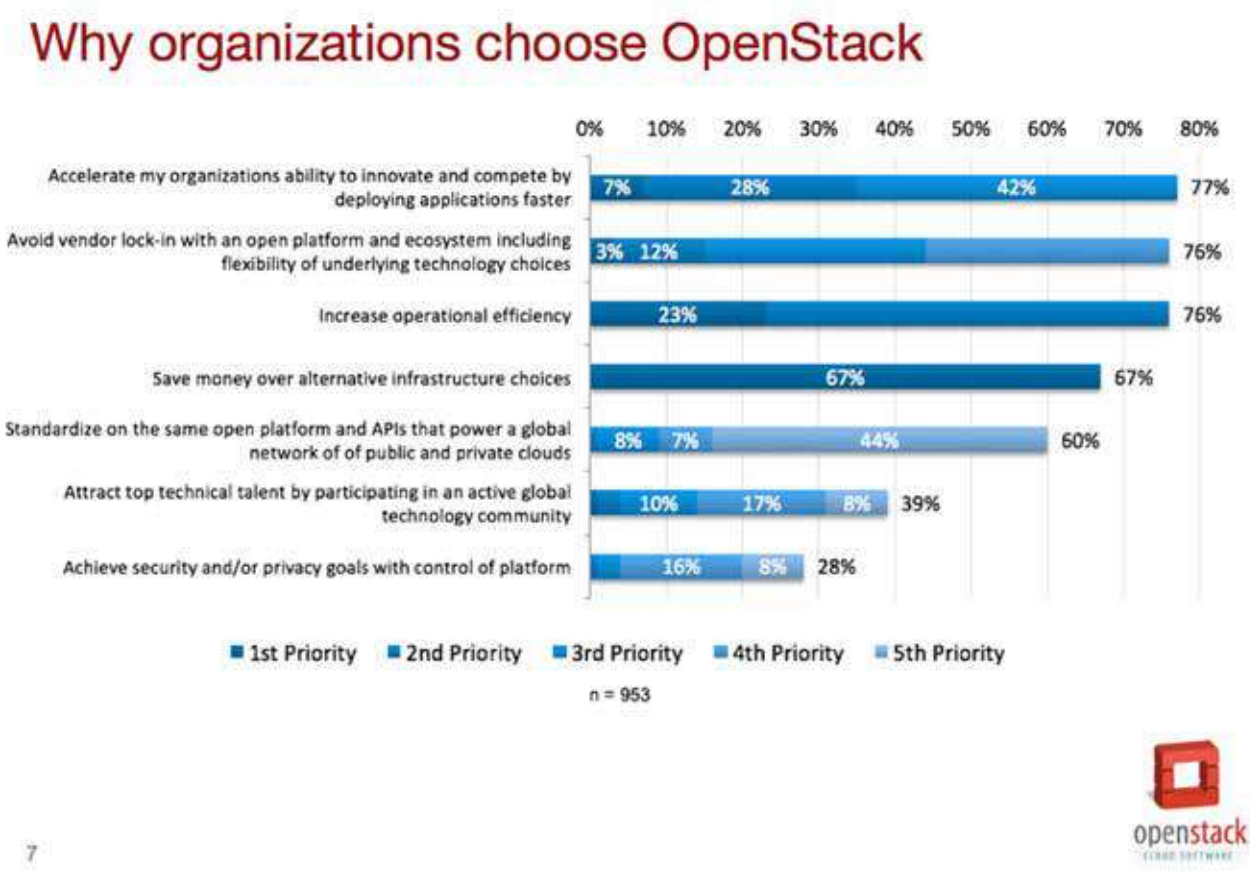
NTT Com's cloud service became the first public cloud in Japan to use OpenStack as its core software and NTT Resonant is using OpenStack to strengthen the operational infrastructure of its 'goo' web portal, which boasts some one billion page views per month and 1.7 billion unique browsers per month. NTT Com and NTT Resonant are also using OpenStack for the introduction of distributed storage and integrated management of networking equipment, bare-metal servers and virtual servers.

NTT Com says it will apply know-how gained through these initiatives in its Enterprise Cloud, now under development. By so doing, the company expects to realize more flexible and secure on-premises cloud systems for enterprise users by means of SDN-connected hosted private (eg bare metal) and multi-tenant environments. It will also deploy OpenStack to manage multi-tenant environments, and NTT Com will provide OpenStack APIs to establish an ecosystem in which various third-party products are connected together.

NTT Com and NTT Resonant says they are committed to accelerating their contributions to the OpenStack Foundation and promoting wider use of the OpenStack cloud-computing software platform.

FalconStor brings software defined storage to OpenStack

Software defined storage company, FalconStor debuted the Cinder Integration for its FreeStor intelligent software-defined platform at the Summit. It claimed that the combination of FreeStor and OpenStack would enable organizations to move data management operations to the cloud to deliver efficient replication, protection, disaster



recovery and optimization across their infrastructure.

"Cinder virtualizes pools of block storage devices while allowing end users to utilize this storage pool without the need for actually knowing where or on what type of device this storage resides," FalconStor said. "By providing an integration driver to Cinder, FreeStor's seamless unified data services, such as deduplication and compression, replication, application-aware snapshots and mirroring, can be converged and virtualized across all storage environments utilized within the OpenStack framework."

FalconStor's Cinder driver enables access to FreeStor's data services including support for application-aware snapshots, sync mirroring and replication and will be submitted to OpenStack for ratification as part of the March Mitaka OpenStack release.

HP upgrades Helion

HP announced the availability of HP Helion OpenStack 2.0, based on the OpenStack Kilo release of October 15, describing it as "a production ready, open source based cloud platform designed to meet enterprise requirements."

HP Helion OpenStack 2.0 includes a number of new features:

- Easy provisioning of new infrastructure and the ability to repurpose existing infrastructure to meet scalability needs without impacting availability;
- Rolling upgrades which facilitate entire cloud environment software upgrades without requiring planned or unplanned downtime;
- Continuous patch management allowing security patches and updates without application interruption;
- Easy to use administrator interface, centralized logging and monitoring at scale across a cloud environment;
- Network configuration flexibility to enable connectivity with existing IT environments;
- Strict OpenStack API adherence to enable cross-cloud compatibility and ability to leverage the upstream ecosystem of third party plug-ins.

It also enables customers to create and manage software defined networks (SDN) in a distributed, multi-data center environment through integration with HP Distributed Cloud Networking (DCN) and Nuage Networks Virtualized Services Platform. According to HP, this removes the boundaries of traditional networking, unlocking the full automation and agility needed for hybrid cloud.

According to Aman Dokania, vice president and general manager, HP Cloud Division, Hewlett-Packard Asia Pacific and Japan: "The configuration, security and scalability advances in HP Helion OpenStack 2.0 enable organizations to deploy OpenStack technology into production with the confidence that they are backed by the experience and support of a trusted end-to-end technology partner."TR

Achieving a competitive advantage in the big data era

The Chief Digital Officer Forum Asia held in Singapore earlier this year highlighted the importance of digitising our economy, developing a strong data strategy, and managing digital data effectively by digital experts. Justin Bock, ANZ regional manager, MapR, looks at the benefits of data analysis for telcos.

The unprecedented volume of data sources is transforming the way the economy works. A multitude of information sources can provide valuable insights into various aspects of our lives and businesses. With the rise of technologies designed to make the world around us more efficient, such as the Internet of Things (IoT), what we are seeing today is just the beginning of this new era: the big data era.

In June 2015, Cisco released its Visual Networking Index study, which estimated 6.2 billion networked devices would be in use in APAC by 2019. Over the same period APAC IP traffic will increase threefold and mobile and Wi-Fi connected devices are expected to generate 88 percent of all IP traffic.

In September, a global Teradata survey found that around 90 percent of organisations had invested in big data, with one third reporting 'very significant' investments. Additionally, APAC respondents were almost twice as likely as other regions' respondents to say that big data analytics represented the most important path to competitive advantage.

Businesses unable to master this new 'data parameter' and unable to harness data analytics effectively to gain insights into their business and customers will struggle to succeed against their more data-driven competitors.

In particular, this data revolution is making a profound impact on telecommunication providers. With the explosive growth of smartphones and tablets, communications service providers (CSPs) are managing exponentially growing volumes of data travelling across their networks. The data is also significantly more complex than before, and now consistently includes photos, video, links, music and location data in addition to billions of plain text emails.

Most APAC CSPs know they need a strong and comprehensive data strategy to address data complexity challenges. Unfortunately, traditional storage and analytics solutions cannot adequately manage the expanding and diverse volume of data. In this big data era, many organisations are still struggling to find a platform for real-time data analysis on their massive amounts of and continually growing customer data.

Turning challenges into opportunities
Managing big data can be an overwhelming and daunting task. However, data can be a goldmine if used effectively with the right data platform. CSPs have a major opportunity to leverage data and gain valuable customer insights for marketing, product development and network operations, as well as for sales and risk management.

By tackling their big data challenges, CSPs benefit in many ways, such as gaining operational intelligence, reducing customer churn, and enabling sophisticated fraud detection, as described below.

Gaining operational intelligence through big data analytics provides telcos with a deeper understanding of switching, frequency utilisation and capacity planning and management. Also, capturing and analysing data produced by infrastructure and IoT sensors can enable more timely and effective network troubleshooting.

Reducing customer churn is another major priority for CSPs, and many would say this is a long-standing challenge. Technologies are now available to enable accurate diagnosis of customer churn and enable alerts for particular behaviour patterns. By looking at multiple factors, such as comments on social media and declining usage, along with historical data comparing behaviour patterns of customers that switched service providers, companies can predict when a customer is at risk of defecting, and proactively intervene to prevent that from happening.

Sophisticated fraud detection is another major benefit CSPs can gain from using a big data analytics platform such as Hadoop. The recent solution developed by MapR with Australian telco Macquarie Telecom is a great example of this. Macquarie Telecom implemented a Hadoop platform to collect Internet traffic travelling through its gateways into a centralised data lake. The platform is then used to run analytics that can determine very specific threat factors and make predictions on when, where attacks may come from. It provides insights into how Macquarie Telecom can anticipate threats and proactively secure the communications system

of its clients, which are mostly in the government. This is just one example of fraud prevention and proactive security, which should be priorities for every telco.

CSPs can also use data to improve the customer experience. For example, clickstream analysis can enable a highly personalised engagement with customers. This could involve targeted promotions and offers, and the optimisation of web pages to increase conversions including cross-sell opportunities — both of which can lead to revenue growth. Also, a big data platform can develop accurate, relevant and real-time recommendations to customers by analysing call logs, usage and satisfaction data combined with social media data, to understand their preferences and behaviours.

Extracting the hidden value in big data and acting on the new insight quickly will provide a competitive advantage for CSPs in this new big data era. Having a data platform in place that can scale and perform is a critical decision.

Getting the right platform, with Hadoop
According to a report undertaken by Big Market Research, Hadoop usage will grow at a compound annual growth rate of 58.2 percent from 2013 to 2020 with the biggest growth being in the service industry and the APAC region. Hadoop removes many of the barriers that businesses typically encounter in effectively processing big data and enjoys an active open-source developer community that continues to deliver innovative complementary data management technologies.

With all the benefits big data can provide for CSPs, it is important to consider data objectives and how these can impact operations. Selecting a utility-grade Hadoop architecture that will support and sustain those initiatives is key.

Hadoop can serve as a highly scalable and high performance data storage and data analysis platform, offering an optimal environment for long-term growth and return on investment. The rich Hadoop ecosystem can provide data exploration tools, such as Apache Drill, that can enable highly granular analysis of both structured and unstructured data in a variety of formats.

New processing engines, such as Apache Spark, can be used to conduct fast analysis of real-time data to reveal sudden disruptions, including reactions to a new service offering or recently launched product. Looking at newly created data for real-time feedback and insights can be a real game-changer.

Finally, businesses can rely on Hadoop to make their network ready, safe and steady. The platform enables CSPs to store and, most importantly, analyse historical data and maintenance information. This analysis can then be used to predict hardware failures and system overloads, as well as develop a deep understanding of how a failure will affect the capacities and health of the network overall.

Using a solution that can perform rich granular analysis on all data formats, and on a large and growing scale, will improve efficiencies, mitigate and manage mission-critical risks, and more profitably serve customers with a high level of personalisation. Additionally, real-time data analysis can provide real-time customer service, which is the ultimate competitive advantage for telecommunications providers in the big data era. TR

Telcos, data analytics and development

The use of data analytics by telcos was the subject of a panel session at ITU Telecom World in Budapest in October, chaired by Telecom Review editor-in-chief Toni Eid. Here's how the ITU reported the session, arguing for the importance of data analytics in meeting development goals, and for the role of organizations like the ITU in facilitating greater usage.

Big data is increasingly being used in interesting and creative ways not just for commercial purposes but also to improve policy making around the world, in developed and emerging nations alike. From health to transport planning, emergency response, agriculture and food, there is hardly an area of government that cannot benefit from big data.

And it is big data, of course, that is driving smart cities right now, and will do so to an ever greater extent in the future. According to Ole Bjorn Sjulstad, deputy director of corporate development, Telenor Hungary, "Many cities now use big data to do their planning; this will increase a lot in future."

Call data records a good source

Among the most widely used sources of big data for policy are call detail records (CDRs) from mobile operators. CDRs also provide the most widely and easily available access to data in developing countries, making them arguably more representative than other big data sources. For this reason, suggested the panelists, mobile operator data could, to a certain extent, be considered a public good.

That very availability means developing countries with poor quality, unreliable or outdated access to statistics through traditional sources such as surveys and censuses could harness big data from CDRs to complement existing national statistics and leapfrog statistical systems. National statistical offices could play a role in terms of ensuring data quality and sharing methodologies.

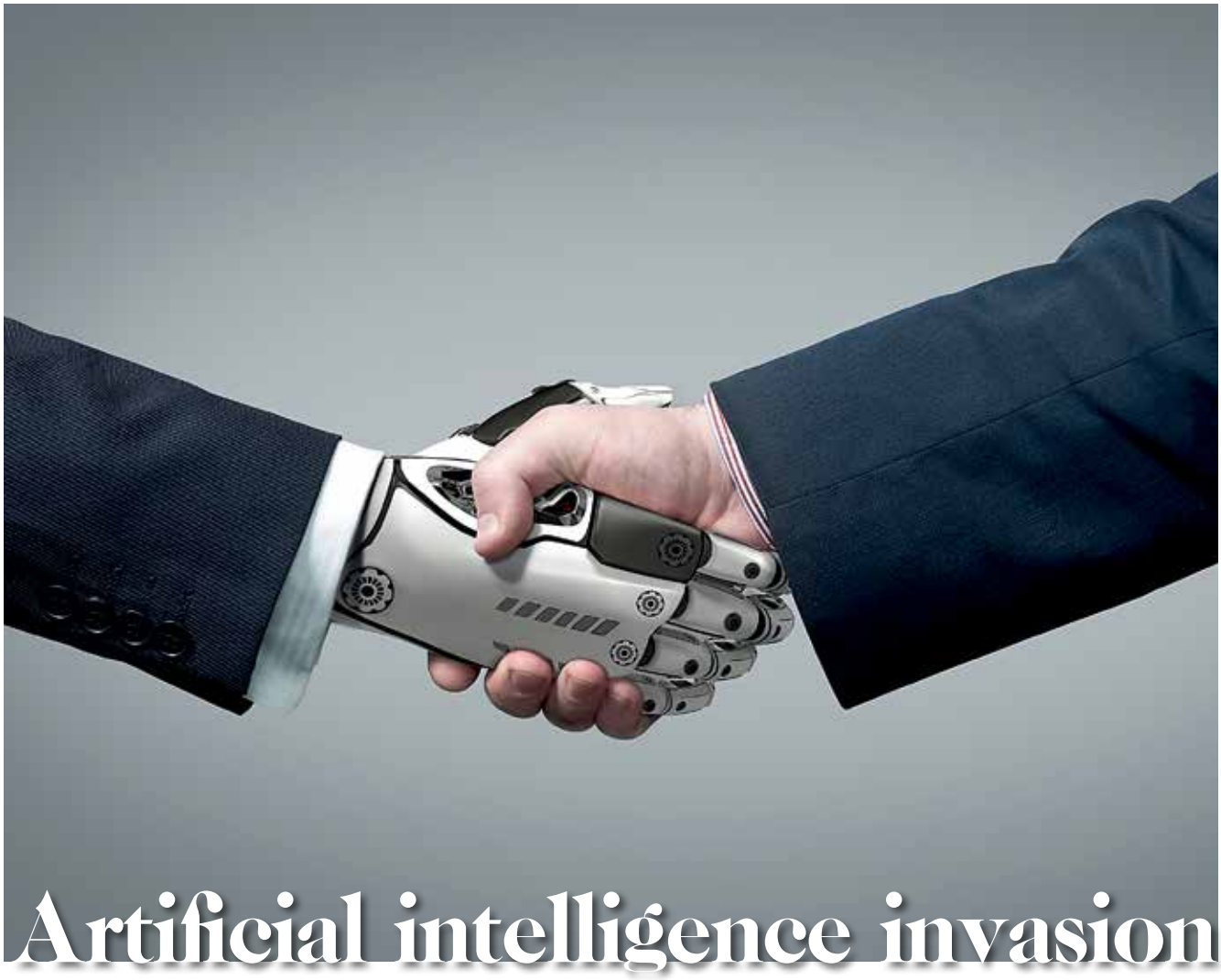
Big data challenges

Nevertheless, challenges remain in the use of big data, most notably in addressing issues of security, privacy and related ethical issues on ownership of data. Plus, notions of privacy can vary widely across cultures and generations, making regulations on personal data use difficult to standardize, let alone apply in practice. Helani Galpaya, CEO of LIRNEasia, called for an attempt to standardize at national, regional or international level: "We need more guidelines for data sharing," Galpaya said.

David Manset, CEO & entrepreneur, GNUBILA, argued that any decisions on the sharing of personal data should be left to the informed end-user: "Informational self-determination is a key principle when it comes to big data," he said.

However, René Arnold, head of department markets and perspectives, WIK, pointed out that in practice this is not easy to implement, saying that individuals could not be expected to negotiate privacy with everyone who might want access to their personal details.

Given the importance of big data in meeting developmental targets, it is critical to bring together different stakeholders, including private sector, governments, NGOs and others, to enable all parts of the ecosystem to benefit. In this context, international agencies and neutral third parties such as the ITU can play an important role in facilitating the dialogue and cooperation. TR



Artificial intelligence invasion

Operators often find diesel generators for off-grid base stations expensive to maintain, have high carbon emissions and are inefficient. Michael Kutschenreuter, general manager of Heliocentris, tells Telecom Review Asia Pacific that the German company's fuel cells and remote management system are the answer.

Artificial intelligence started to emerge several years ago, when engineers and scientists began talking about thinking machines. This innovative idea has become our reality; we are living in a century where the most transformative computer technologies and innovations are become part of everyday life. Drones, smartphones and social networking all involve AI; anyone using a smartphone, for example, is already using some sort of machine intelligence.

Google Now's suggestions or Apple Maps' determination, and the ability to get computers to infer information that they are not directly supplied with, and to act on that information, are all proof that machine intelligence is on the rise and is going to be pervasive.

Within a few years, the smartphone's AI will have power enough to understand the context of what people are doing, figure out how it should help and act on those conclusions. People will be able to choose whether they want that assistance provide by an app on their phone, or from the cloud.

The cloud-based version will be smarter, because it will have access to much more data and processing power whereas the phone-based version will be much more personal and will function even without a network connection.

Both the CIA and NSA have interest in AI for data-mining reasons, and the

NSA has a track record of building massive computing clusters costing billions of dollars.

Self drive cars by 2020?

Google, for instance, is highly involved in AI innovations: a number of robotics startups have been acquired by Google and the company has already demonstrated the Google Self-Driving Car, a project that involves developing technology for autonomous electric cars.

The software powering Google's cars is called Google Chauffeur and the lettering on the side of each car identifies it as a self-driving car. In May 2014, Google presented a new concept for their driverless car that had neither a steering wheel nor pedals, and unveiled a fully functioning prototype. Google says these cars will be available to the public in 2020.

Facebook, on the other side, has created a standalone application that uses artificial intelligence. The media giant's latest product, Moments, uses facial recognition technology to identify the friends in a photo. People can then share the pictures with the friends in that shot. The Moments application, available in the US on iOS and Android, uses the same facial recognition technology that powers the photo tagging suggestions on Facebook.

Facebook uses deep learning as a way of recognizing images on its social network, and it's exploring the technology as a means of personalizing the Facebook News Feed so that people are more likely to enjoy what they see.

The next big step for Facebook is natural language processing, which aims to give machines the power to understand not just individual words but entire sentences and paragraphs. Additionally, Facebook is building a dedicated AI team and opening a new artificial intelligence lab in Paris.

More than 1.4 billion people use Facebook and hundreds of millions rely on its messaging services: What's App, Facebook Messenger and its photo sharing service, Instagram. In order to help it sift through this flood of text, pictures and videos Facebook built a program called Facebook AI Research, and is investing heavily in artificial intelligence.

More proof of AI's invasion can be found in military robotics, one of the more advanced uses of autonomous AI. The US Navy wants to integrate robotics and artificial intelligence into its systems, from war fighting missions to non-combat support roles, and is seeking input on what types of AI research are worth investing in.

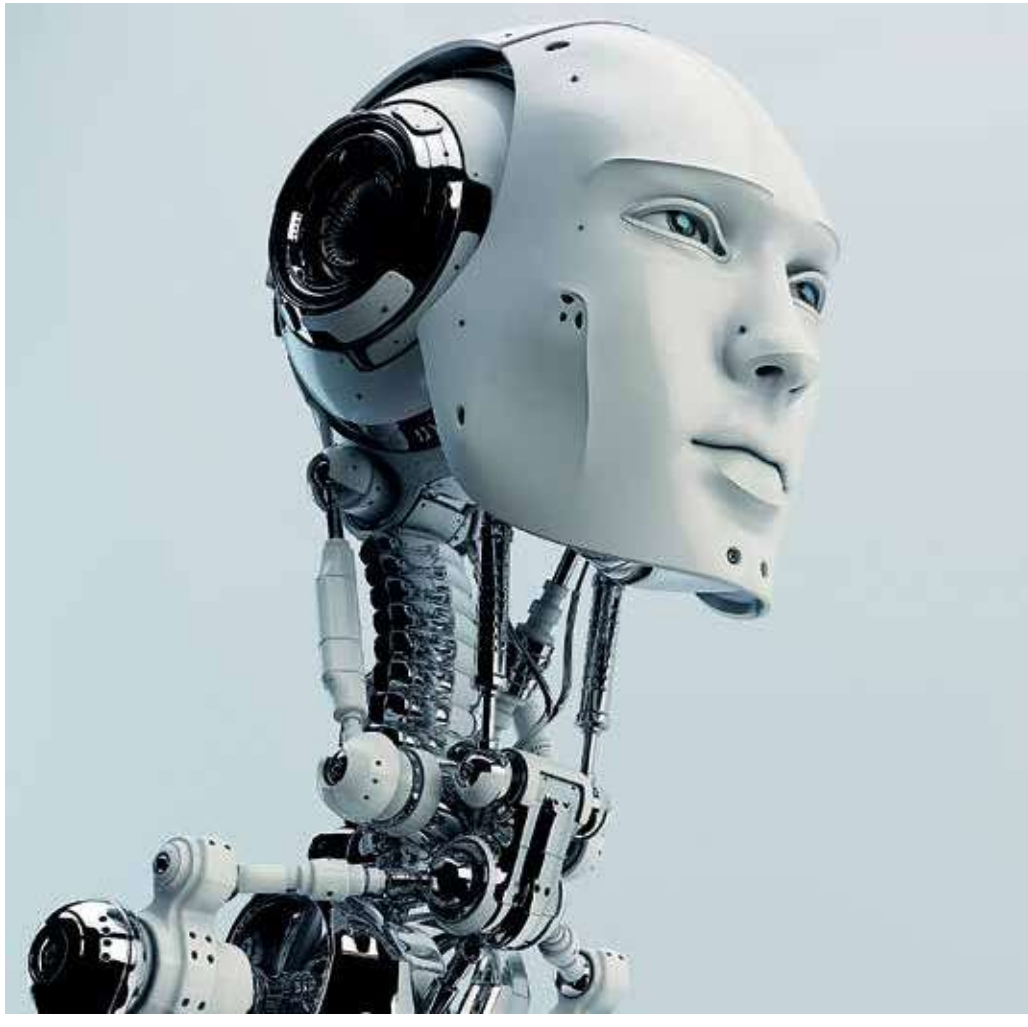
Beware the killer robots

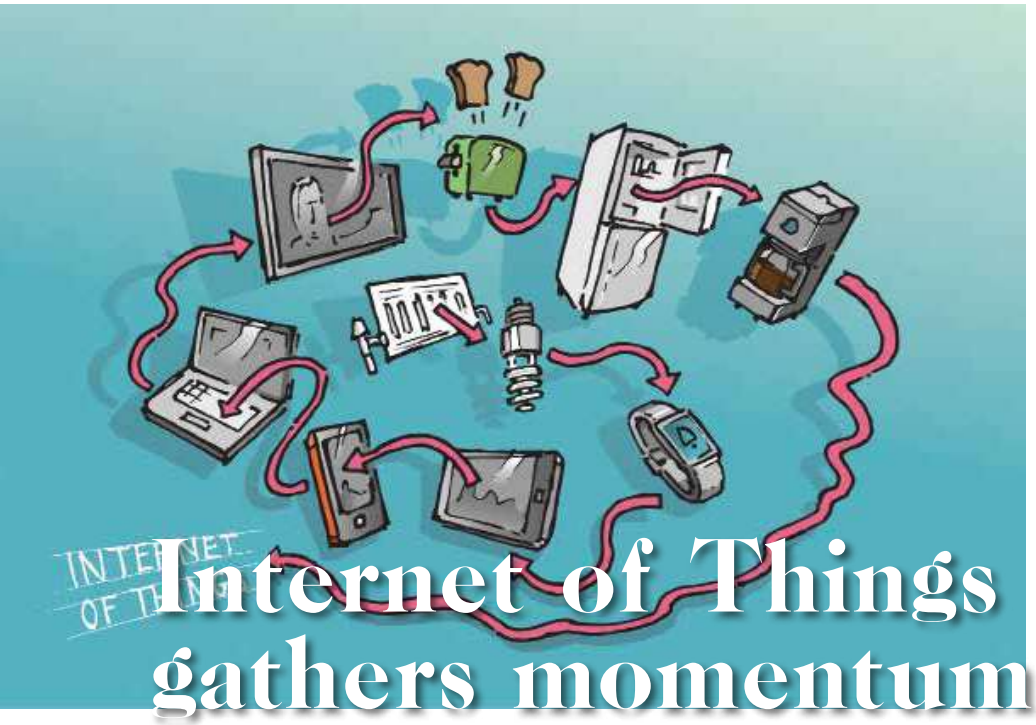
Recently, military robots have been employed for various tasks, such as carrying supplies and exploding landmines, and militaries are also developing robots that could identify and shoot targets on command.

The US military already has its Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS), a Large Diameter Unmanned Underwater Vehicle (LDUUV) and the Swarmboat unmanned vehicle on the surface.

Countries have been deploying semi-autonomous drones for several years now; up to 87 countries already use drones, and there is increasing pressure for militaries to adopt this technology.

However many eminent people are warning that precautions are needed before the technology controls us. These technological developments will give us three different realities: robotized humans, thinking robots and artificial intelligence. So, the question to be asked is, "What will AI look like over the coming years?" TR





Internet of Things gathers momentum

Everywhere you turn someone is touting the "Internet of Things" as the next big deal. A globe-spanning network for the Internet of Things (IoT) has been built over the past 20 years that provides the coverage, security and reliability needed to connect us and bring intelligence to the things that surround us.

Cellular networks already cover 90 percent of the world's population, but even with the networks in place, a number of roadblocks to supporting mass-market adoption of IoT have remained.

Iain Maloberti, senior vice president Orange Labs Networks, says: "The Internet of Things has so much potential. We are committed to working with key IoT companies to support innovations that enhance the day-to-day lives of our consumer and business customers.

"We are really pleased to see Ericsson working with leading ecosystem players to address the cost, coverage and battery life issues that have hindered broader mass uptake of IoT applications. We see that the best is yet to come."

Park Jin-hyo, senior vice president and head of Network R&D Center, SK Telecom, says: "Our ambition is to set the pace for mobile networks, so we are already proactively building toward 5G technology, which will include an evolution of today's LTE and innovations driven by new IoT use cases. Connectivity underlies everything we do and Ericsson's latest innovations enhance both networks and devices so that we can develop new IoT opportunities in Korea. This is sure to accelerate uptake of IoT and allow us to quickly reach our customers with useful IoT services."

There are already more than 230 million cellular machine-to-machine (M2M) subscriptions for IoT devices, but certain challenges have limited the potential for large-scale adoption across a variety of use cases, namely: the cost of IoT devices, device battery life, and cellular coverage in both remote areas and deep inside buildings.

Matt Hatton, Founder & CEO, Machina Research, says: "For IoT to truly erupt, standardization is vital and interoperability is key. By working with big names like Intel and other IoT ecosystem players like Altair, Sequans and Telit, Ericsson is ensuring that opportunities for efficiencies are not missed and that the device and network ecosystem develop in synch."

Ken Stewart, chief wireless technologist and fellow, Intel Corporation, says: "Connectivity is critical to mass adoption of new IoT applications for smart cities and industries. Intel is helping clear the path for IoT's rapid growth through its research and development of cutting edge new technologies, and by working closely with ecosystem partners.

"We are pleased to collaborate with Ericsson to jointly drive standards adoption of solutions that can be used immediately on existing operator networks."

An additional capability included in this software release is the enablement of service prioritization to optimize network resources while addressing the diversity of IoT use cases. As more IoT devices connect to the network, it is important that they and the services they provide can be prioritized, especially during times of heavy traffic.

IoT QoS Admission Control for GSM enables the prioritization of devices trying to access the network, such as giving medical equipment priority over a utility meter, and it can even disconnect low-priority devices temporarily to mitigate any capacity limitations. This functionality is already supported in LTE.

Arun Bansal, senior vice president and head of business unit Radio, Ericsson, says: "We are accelerating IoT growth on existing LTE and GSM networks to ensure a global foundation for a vast range of new consumer, industry and government applications, from Smart Cities to connected farms.

"With our leading national and multinational operator customers, like SK Telecom and Orange, and ecosystem partners like Intel, we are co-creating end-to-end IoT network and device solutions that harness the power of reliable, globally scalable, standards-based systems and services. These innovations put our mobile operator customers solidly on the road to 5G."

Gartner predicts that IoT will provide a USD1.9 trillion increase in value across sectors in 2020. Ericsson plays a role in all levels of IoT transformation, from rollout to enterprise and business processes, platforms and cloud and radio connectivity.

Ericsson's IoT Connectivity Brings Efficiency to Winemakers

IoT can help in many ways but some people say when it improves your wine it is time to pay attention. Ericsson has announced a collaboration with Intel, Telenor Connexion and MyOmega System Technologies to build a secure Internet of Things (IoT) connectivity service that supports more effective wine production. The service will enable winemakers to collect data on air and soil humidity and temperature, as well as solar intensity, using IoT sensors and Intel based IoT gateways connected to a cloud service.

The data can be used to perform predictive analysis and to support resource management and real-time remote monitoring, leading to higher quality production, lower costs and reduced environmental impact for winemakers.

The size of the wine industry export globally is EUR 26 billion according to a market research International organization of Vine and Wine (OIV), which indicates the potential to scale these types of solutions. TracoVino services and solutions will be offered by MyOmega towards the winemakers. Telenor Connexion includes Ericsson's secure IoT service in its offering. This service is based on the Ericsson Device Connection Platform (DCP) integrated with the Authentication Federation Gateway.

Built on the 3GPP standard Generic Bootstrapping Architecture for LTE, the implementation features the world's first end-to-end security and authentication capabilities for transferring sensor data to the cloud for processing and analysis.

Ericsson DCP is a cloud-based IoT/ machine-to-machine (M2M) platform that handles connectivity management, subscription management and OSS/ BSS, enabling automation of business processes between operators and enterprises. Intel will supply processors and LTE modems for the IoT gateways and MyOmega System Technologies, headquartered in Nuremberg, Germany, will provide sensor and gateway hardware and software.

"The Internet of Things is poised to change our lives by connecting isolated objects to gain valuable information and improved efficiencies," Rose Schooler, vice president of IoT Strategy at Intel, says.

"Together, Ericsson, Intel, MyOmega and Telenor Connexion are demonstrating with TracoVino an end-to-end solution connecting nature to the Cloud." Mats Lundquist, CEO, Telenor Connexion, Telenor Connexion, says: "By selecting DCP, Telenor Connexion can feel secure while delivering global connectivity that supports business critical applications. Telenor Connexion and Ericsson have a long tradition of working together to set the standards for IoT. Thanks to Ericsson's long experience in the field, we know that the solution can evolve and if necessary support additional revenue models and data-transfer solutions in the future. In addition, having one single global provider of connectivity enables the solution to be standardized no matter where it will be sold or used."

Anders Olin, vice president, product area network functions, business unit cloud & IP, Ericsson says: "By delivering standardized, secure end-to-end connectivity from IoT sensors to the cloud, this partnership represents a strong proof point for Ericsson's IoT leadership. We see great potential for scaling the service to winemakers globally and to additional industrial applications in the networked society, such as real estate management."

Bernd Möller, CEO, MyOmega System Technologies says: "Quality tools for the winemakers that are reducing their risks and improving the yield is our key offering. We are building with the TracoVino services and solution a first scalable IoT offering that combines sensors, IoT gateways and a secure and powerful communication solution. Thanks to Telenor's DCP and the Ericsson network technology we can scale towards the entire wine market. We base our gateways on technology provided through Intel."

Four winemakers in the Mosel Valley, Germany are participating in the field trial already. TR

Efficient enterprise connectivity via software defined radios

In an interview with Telecom Review Asia Pacific, Dr Charalampos Papanastasiou, product line manager at Intracom Telecom, talked about the company's software defined radios and how they can enable telecom operators to offer competitive enterprise connectivity.

What are the major challenges that telecom operators go through?
The first challenge is how to scale network expansion along with business growth and avoid any expensive initial investments. The second challenge for operators is how to reduce operating expenses. The third challenge involves quick network setup/expansion and service activation.

Could you give us details about the two new radio hardware factors that Intracom Telecom has recently introduced?
These two new radio hardware factors employ the software defined architecture to be able to realize point-to-point (PtP) or point-to-multipoint (PtMP) connectivity and create hybrid connectivity.

The outdoor software defined radio (OSDR) is more appropriate for rooftop MW radio deployments, as WiBAS solution, while StreetNode is a customized solution for deployment within the street environment in lampposts and building walls, operating in the 10.5/26/28/32/42 GHz frequency bands.

The unique innovations of the OSDR/StreetNode platforms lie in their capability to operate in PtP or PtMP connectivity through the simple activation of various features using software keys, and also the ability to be upgraded with new capabilities. In a typical telecom network both PtP and PtMP connectivity are necessary. PtP can create longer radio links, while PtMP can achieve area wide connectivity at a significantly reduced cost per link.

What kind of services do you provide?
The OSDR/StreetNode solutions have the techno-economic characteristics to efficiently reach customer locations, offering scalable carrier ethernet services up to 0.88Gbps full-duplex, virtual private network (L2) services, voice, video and legacy (E1 PWE) services over ethernet, best-in-class quality of service and very high availability along with minimal latency for critical applications.

It is very important to note that the business segment includes a variety of customers, some of which have very strict service KPIs. The platforms offer very advanced and intelligent mechanisms to multiplex all these diverse service requirements in the same platform, while fully meeting all individual customer needs.

Successful multiplexing of diverse customers, such as industrial parks, residential compounds, banks, retails chain stores, hotels, restaurants, corporate networks, municipalities, universities, hospitals, individual SME customers and rural broadband initiatives (eg Europe 2020), in the same infrastructure, is imperative for telecom operators to implement pay-as-you-grow strategies and improve cost efficiency.

What features differentiate the StreetNode?
OSDR/StreetNode offers unique features that can be customized to provide cost-efficient, business-grade broadband services: up to 4096-QAM/0.88Gbps full duplex PtP throughput; up to 1024-QAM/540 Mbps per PtMP sector; unlimited scalability and only two frequency channels; carrier-grade link availability up to 99.999 percent, high equipment reliability with more than 50 years mean time before failure (MTBF) and 1+1 configurations if needed; very low latency for critical applications; a three-stage traffic QoS classification with quality assurance mechanism that includes an ethernet traffic polisher and a MAC/L2 scheduler with 8x queues.

What is OSDR capable of?
A very important feature of OSDR is its capability to switch from PtP to PtMP topology resulting in the average link cost dropping significantly. Consider a realistic operator new "service area" scenario where initially there is a single customer connected via a single PtP link. When more customers join the service, eg in locations C and D, the equipment at point A is switched to PtMP Hub operation and then TS equipment is deployed at the new C, D locations. (see figure 1)

The operator has the flexibility and capability to switch to PtMP immediately after finding a second customer and avoid the deployment complexity of a second individual PTP link, while reducing the link cost. In this case, there is one unit in the aggregation side for many endpoints; hence, the equipment count is 1+N.

As the number of customers increases, the average link cost drops by 40 percent. Furthermore, the operator saves space, site expansion costs and power consumption in the aggregation side and reduces costly future site visits by 50 percent.

The OSDR technology allows for a true, unconditional pay-as-you-grow

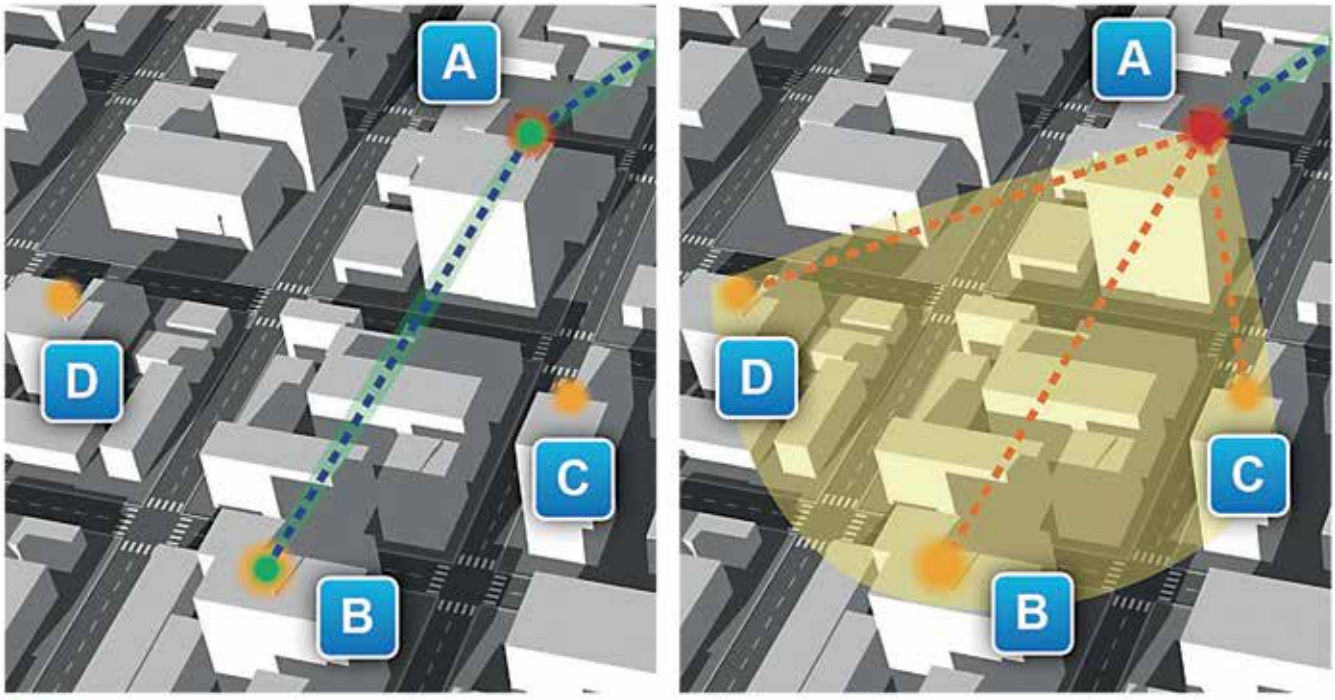


Fig.1: First customer is connected with PtP (left) and subsequent customers with PtMP (right)

strategy. As more customers are connected, switching to PtMP reduces the average link and cumulative link CapEx.

The OSDR platform offers a variety of operational benefits. Could you give us an idea about it?

In terms of low technology complexity, a well-known problem for operators is that business customers sign and leave contracts in an unpredictable manner. Therefore, equipment transfer from old to new customers is a common activity.

The OSDR platform allows equipment to be re-used either as PtP or PtMP without having to maintain two different product types. The common OSDR H/W also results in having to maintain less spare units for advanced service restoration.

Moreover, a unified FCPS functionality management platform for all OSDR solutions and other Intracom Telecom products ensures a holistic view of network operations. It should be mentioned that the OmniBAS solution also includes indoor aggregation units that may be required by the customer instead of other L2 switches, which can be managed by the management system in an E2E manner.

The unified management platform has a common, intuitive interface and offers full management capabilities at reduced costs. Regarding E2E (end-to-end) configuration, it is possible, as previously mentioned, to use OSDR solutions at the same site or network and create a hybrid PtP/PtMP architecture. The E2E configuration manager allows easy service creation from one customer point to another, ie a L2 VPN, while all intermediate equipment configurations, such as traffic flows, are done automatically.

Finally, upgrading the service in a particular OSDR link (PtP or PtMP) is very easy and can be completed remotely via uni|MS. Capacity can be increased at any later stage and additional functionality can be added (eg OAM) by simply unlocking the equipment's capabilities using software keys.

BOX (don's use logo in TR as it is for middle east, use the one I have supplied)

About Intracom Telecom

Intracom Telecom is a global telecommunication systems & solutions vendor operating for over 35 years. The company innovates in the areas of small-cell backhaul, wireless transmission and broadband wireless access and has successfully deployed its point-to-point and point-to-multipoint packet radio systems worldwide.

Intracom Telecom offers a competitive portfolio of revenue-generating telco software solutions and a complete range of ICT services, focusing on big data analytics, converged networking and cloud computing for operators and private, public and government clouds.

The company invests significantly in R&D developing cutting-edge products and integrated solutions that ensure customer satisfaction. Over 100 customers in more than 70 countries choose Intracom Telecom for its state-of-the-art technology. The company employs more than 1,900 people and operates subsidiaries in Europe, Russia and the CIS, the Middle East and Africa, Asia and North America. TR

Cloud RAN virtualization, centralization and coordination

According to Ericsson, mobile broadband is approaching a point where cellular infrastructure will be a viable substitute for fixed broadband in many markets.

In this new environment, mobile operators are seeking ways to increase network capacity and coverage while reducing time to market for new services and achieving lower total cost of ownership.

By introducing cloud RAN architectures, operators will be able to meet accelerating demands through the use of network functions virtualization techniques and data center processing capabilities in their networks, enabling resource pooling, scalability, layer interworking and spectral efficiency.

Ericsson is forecasting phenomenal growth as the development of networks; economic growth and opportunities create more connectivity potential.

As cities around the region work progressively towards smart city status, a unique new ecosystem of stakeholders, technology and information is being formed where innovation can flourish at another level, and M2M connectivity can enhance the experience in many industries while addressing the many global challenges such as sustainability.

Residents are stepping into a revolutionized future where convenience is transformed by the Networked Society." The question now is how operators can best make use of virtualization technologies in RANs while at the same time building cost-, spectrum- and energy-efficient networks that offer a seamless user experience.

However, there are major distinctions between cloud computing in the RAN compared to the core network and service layer.

For example, the bulk of the cost of a mobile network lies in the large number of distributed base station and antenna sites, as well as in the last mile transport network links – not in central nodes and sites.

Consequently, to calculate the return on investment benefit of implementing cloud RAN, the costs associated both with the central parts of the network and its distributed elements and last-mile links must all be taken into account.

Cloud RAN options and challenges

The main challenges for mobile network infrastructure over the next five years will be to: manage large amounts of new spectrum, primarily on higher bands (> 4GHz) and then combine these with existing bands, so that by 2020 a typical mobile network operator could have access to more than 100MHz in five to 10 bands; deploy new sites to support new

use cases – such as wireless offices and connected cars – which may also require new business models; develop efficient hardware and software solutions that enable the speedy introduction of new services in a sustainable way, from both an energy and cost perspective.

5G use cases and technologies, such as critical machine-type communication and full dimension multiple-input, multiple-output (FD-MIMO) may also drive the further evolution of the RAN architecture, exploiting advances in backhaul and antenna systems, among other things.

Cloud RAN architecture framework

Driven by greater needs for coordination as well as increasing resource efficiency and advances in network virtualization, cloud RAN architecture allows for the use of NFV techniques and data center processing capabilities such as coordination, centralization and virtualization in mobile networks. This supports resource pooling, scalability, layer interworking and spectral efficiency.

A Cloud RAN should support the following: separation of control and user plane to support flexible scaling of capacity for different functions of the RAN; a variety of deployment options for anticipated network scenarios, including a wide range of transport network solutions, base station configurations and user applications; alignment with legacy deployments, which reduces the overall network complexity thanks to a unified network architecture.

Implementation aspects

In general, virtualization is a technique that can mean different things in different scenarios, and it is unlikely to mean the same thing in a RAN context as in, for example, a data server context. The reason for this is the substantial difference in real time requirements imposed by the radio access protocol. Many of the synchronization requirements that ensure the performance of the radio access protocol are on the microsecond level and, in some cases, the nanosecond level.

Thus, RAN functionality is not easily hosted by the so-called virtualized platform as a service (PaaS) model, as is possible with straightforward applications and server-type functions. On the other hand, there is no need to virtualize all RAN functionality to provide the benefits of Cloud RAN.

Virtualization as an execution environment technique can be used to provide isolation, scalability and elasticity, among other things, for the Radio Resource Control (RRC) protocol layer. When applied in this manner, virtualization can be used to simplify the management and deployment of the RAN nodes, for example, by allowing the definition of arbitrarily-sized base stations and for more flexible scaling of higher layer functionality, separate from the scaling of other layers. Virtualization can also be used to leverage a common execution environment for RAN, core and application functionality, providing the ultimate in execution proximity and ensuring maximum responsiveness of, for example, a certain service.

The possibility to virtualize network functions in this way makes it feasible to place the functionality on a more generic and generally available execution platform together with cloud core applications and other latency critical services, sometimes even in a PaaS environment.

Centralization in Cloud RAN

Centralizing base station processing with Cloud RAN simplifies network management and enables resource pooling and coordination of radio resources. Pooling, or statistical multiplexing, allows an execution platform to perform the same tasks with less hardware or capacity. This is of greatest interest for tasks that require a large number of computational resources. It also means that the most desirable pooling configuration is a fully centralized baseband approach with a star connection long-haul CPRI between the pooled baseband and the distributed remote radio heads.

This is because processing of the lower layers constitutes such a large part of the computational effort. As mentioned earlier, however, there are not many cost-efficient solutions for long-haul CPRI. By using separate (data center) processing capacity for higher layers, new features can be introduced without affecting the performance and capacity of distributed baseband units.

The introduction of massive MIMO configurations – which will be of increasing interest with the move into ever-higher frequency bands – will also further highlight the need for optimized transport and baseband processing for centralized baseband configurations.

Coordination in Cloud RAN

Radio coordination between cells and bands is used to maximize spectrum efficiency and user experience. It is anticipated that there will be a need for different bandwidths of cells in different bands, as well as increasingly heterogeneous network deployments, and this will call for increasingly tight interworking between technologies and cell layers to ensure a seamless user experience.

Centralized coordination functionality is advantageous in order to simplify and maximize performance of the network, including handovers, carrier aggregation and interference management. Again, the centralized baseband configuration provides great potential to leverage interference management, joint processing and reception-combining techniques. But it is also still possible to have many levels of coordination in cases where centralization is limited to other higher layers of the radio protocol stack.

A Cloud RAN timeline

There are three primary developments that will shape the Cloud RAN environment going forward: deployments of heterogeneous networks with a mix of macro and small cells, and new bands with substantially different coverage will benefit significantly from radio resource coordination, which becomes more effective with the centralization of the execution of the resources seen in Cloud RAN; the imminent adoption of NFV into mobile core networks.

With the knowledge gained from this, focus will naturally shift towards the introduction of cloud RAN, which will enable operators to offer new services more rapidly over the future mobile broadband networks that will form the backbone of the networked society. TR

ITU Telecom World 2015 opened for business

ITU Telecom World 2015, the global ICT innovation event for SMEs, corporates and governments took place in Budapest from 12 to 15 October in the presence of HE Viktor Orbán, prime minister of Hungary, ITU secretary general, Houlin Zhao, and a host of other distinguished high-level participants from governments, enterprises, SMEs and startups from around the world.

ITU Telecom World 2015 was an exhibition for digital solutions, a forum for sharing knowledge and a networking hub for governments, and industry — from established players to SMEs and startups – and academia. Its aim is to help ideas go further, faster and to promote the innovative, transformative ICT-enabled solutions that will make the world better, sooner.

The exhibition feature over 230 exhibitors, sponsors and partners from over 40 countries, the Forum and Leadership Summit included 200 speakers and 44 panel sessions, workshops and sponsored sessions. Over 250 leaders from 88 countries across the globe took part in the week's proceedings. The event's Young Innovators Competition also celebrated six winning young social technopreneurs, selected from a total of 493 entries from 74 countries.

Addressing a packed auditorium, Hungary's prime minister, HE Viktor Orbán, spoke of past and present Hungarian innovators and outlined plans for Digital Hungary, saying that Hungary could be as proud of its role in the ICT sector today as it was in the past. "We have grounds to be proud of the fact that the digital economy of Hungary is one of the fastest developing in the EU," he said.

Speaking via a video link, UN secretary general Ban Ki-moon encouraged government and technology industry leaders gathered in Budapest to "foster greater innovation and entrepreneurship in the ICT sector, especially among small and medium sized business."

Ban Ki-moon calls for universal connectivity

He urged participants to "consider what more you can do to ensure universal connectivity, close the digital divide, open doors to knowledge and ensure the full participation of women and girls in the ever growing digital economy in support of the 2030 agenda for sustainable development."

Kerstin Günther, managing director of Deutsche Telekom's Pan-Net and chairperson of Magyar Telekom, said: "I think it is a powerful message and feedback for Hungary and the whole region that ITU brought its jubilee world conference to Budapest. The future is present in Hungary, and Hungary is a hub of the European ICT industry right now."

Echoing a core theme of the event, she said: "Digital Hungary will be a real European success story that may serve as a role model for any country in the world and as a blueprint of how government and industry can work together."

The opening ceremony marked the start of an action-packed few days of high-level debate, dialogue between long-established business, SMEs and governments, showcasing and networking. Through an interactive program of debates, the Forum tackled central issues affecting the ICT ecosystem today, opening with a top-level Leadership Summit on accelerating digital innovation for social impact. Discussions comprised panel debates, workshops, high-level round tables and keynotes.

The event also included an exhibition for digital solutions from emerging and developed markets, showcasing the smartest ideas and entrepreneurial spirit of startups from countries, regions and top industry names from across the world.

It also hosted a number of key networking opportunities, including activities that enabled delegates to engage on a B2B or B2G level, such as B2G and B2B dialogue and lunches, bringing together government, industry and SMEs. TR

Start your all-flash storage journey here

Paul Shaw, general manager, storage with Hewlett Packard Enterprise, South Pacific offers five tips for organizations contemplating the move to all-flash storage.

Finding smarter and more efficient ways of managing data overload is now dominating investment decisions in technology departments across the region. With the digital universe experiencing unprecedented digital growth of roughly 40 percent a year[i], the demand for data storage has never been greater.

Coupled with ever-increasing expectations around "instant responsiveness" and "always-on availability", many businesses are looking for a miracle solution to alleviate their storage burdens.

Enter flash-based storage solutions – particularly all-flash arrays. These are being heralded as the way of the future, critical to helping organizations stay ahead of the data onslaught and accelerate business critical applications. In fact, Gartner predicts that by 2020, the number of data centers that will use only solid-state arrays (SSAs) for primary data, instead of hybrid arrays, will increase from zero percent today to 25 percent.[ii]

However, many businesses have been hesitant to adopt all-flash solutions because of the perception of high costs and concerns about the reliability of all-flash storage technology.

The truth is that the cost of all-flash storage is lower than ever and performance has never been more robust. Ignoring the truth around all-flash storage means that you could be hampering your business's ability to effectively manage data and power the new workloads that drive innovation – thus giving your competition a head start.

Debunking the myths of all-flash storage

Concerns over the high cost and reliability of flash storage compared to hard disk drive (HDD) solutions have been key barriers to organizations

> The cost of all flash storage is lower than ever and performance has never been more robust.

embracing newer storage technologies. For many, the prevailing attitude has been to play it safe and stick with the proven technology – or use flash storage solely as point solutions.

But if you want to stay ahead of the competition you need to change your position quickly. Next-generation all-flash storage array architectures are now delivering greatly improved functionality and dependability – all at a lower price. Even IDC believes that any enterprise that still thinks flash is too expensive to deploy as its primary storage environment is doing itself a disfavor.[iii]

Higher performance levels are driving down the cost of all-flash storage to a competitive price point compared to HDD-storage arrays – in some cases to as little as $US1.50 per useable gigabyte of storage. Deduplication and data compaction technologies such as thin provisioning and granular allocation allows your investment to be stretched even further.

Unlocks opportunities, power innovation

The primary benefit of flash storage is increased speed: extremely rapid data transfers at sub-millisecond latency. This opens up performance capability so your business can leverage new applications and workloads such as real-time, predictive data analytics.

While speed is important, the value of all-flash storage technology goes far beyond this. It also opens the door to innovation by creating new capabilities for business processes and opportunities.

A high density, large capacity flash array can reduce the storage footprint within your data center by as much as 80 percent, with flow-on reductions in power and cooling costs.

Five tips on getting started

You might be asking yourself: "How do I choose the right all-flash solution for my business and where should I get started?"

With good planning, the switch to all-flash storage can be straightforward. The key is to identify an all-flash storage array that is architected to optimize flash's performance while delivering the required level of mature data and storage management services.

Here are some simple steps to help you decide what's right for your needs and start your all-flash transition:

1.Look for an all-flash storage solution that offers a combination of speed, resiliency, affordability and scale:

- Speed – Aim for high input/output operations per second (IOPS) at predictable response times under one millisecond to drive more revenue-generating transactions.
- Resiliency – Insist on enterprise-class mission-critical availability with zero data loss recovery from backup storage. Arrays should be proven capable of 99.9999 percent availability.
- Affordability – Ensure there is price parity with high performance HDD.
- Scale – Look for a flash storage system with petabyte scale to enable enterprise growth. The ability to scale is not always a given, but there is no point having the power of flash if future capacity is restricted.

2. Once you've chosen the right all-flash storage platform, catalogue your workloads and applications. Identify those that have the strongest links to customer satisfaction and employee productivity.

3. Prioritize these customer/employee-facing applications or workloads and move them to the all-flash platform first. Accelerating these workloads will have a positive impact on two important groups of users, and will provide confirmation to the business that all-flash storage really does work with both immediate and long-term impacts.

4. Ensure that your all-flash storage solution integrates seamlessly into your existing data center infrastructure. Otherwise, you'll find yourself with isolated storage silos and an inability to migrate valuable business data in or out.

5. Anticipate future needs to predict the type of storage capacity your organization will require over the next 3-5 years. Ensure the potential solutions you investigate can meet these needs simply and affordably within the system you decide on from the outset.

Enterprises that have been agonizing over a shift to all-flash storage technology can relax and follow the above tips to start planning their transition with ease.

With all-flash storage arrays becoming more affordable, you can confidently invest in the latest flash storage platforms and start reaping immediate benefits of accelerated business performance.

All-flash systems are demonstrating proven reliability and can now be embraced by any company, regardless of size, budget, growth rate or quality of service requirements.

Investing in the right all-flash storage technology that is most relevant for your workloads will deliver scalable, flexible solutions that are reliable, efficient and easy to manage.

Ultimately, you'll be able to focus on driving outcomes that matter to your business and use your storage infrastructure to open the door to innovation in today's hyper-competitive environment.

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[i] Digital Universe Study, with data and analysis by IDC, April 2014
[ii] Gartner Magic Quadrant for Solid-State Arrays, June 2015
[iii] IDC Evolving Flash-Optimized Storage Architectures, Doc # 256994, June 2015. TR

ITU and MEF to co-operate on connectivity standards

The ITU and the Metro Ethernet Forum (MEF) have concluded an agreement to advance the worldwide development and deployment of emerging connectivity services — designed to be agile, assured, and orchestrated — in addition to standardized CE 2.0 (Carrier Ethernet) services.

The agreement focuses on opportunities for mutual standards referencing for CE 2.0 and LSO (Lifecycle Service Orchestration), standards compliance/certification and global education as well as alignment in emerging areas such as trust in the information society, orchestration and virtualization and 5G cloud access.

The ITU Standardization Sector (ITU-T) and MEF will establish a joint steering committee composed of two representatives from each organization that will supervise the overall implementation of the collaboration. Also, the two bodies intend to organize periodic leadership workshops to focus on specific aspects of proposed collaboration relating to the adoption of ITU-T and MEF standards in the areas of Carrier Ethernet and the next generation of agile, assured and orchestrated connectivity services.

EU and China to co-operate on 5G standards

The EU and China have signed an agreement on 5G cellular standards that they say commits both parties to reciprocity and openness in terms of access to 5G networks research funding, market access and membership of their respective 5G associations.

The joint declaration was signed by Günther Oettinger, European Commissioner in charge of the Digital Economy and Society and Miao Wei, Chinese Minister of Industry and Information Technology. It follows similar agreements with South Korea and Japan signed by the Commission in recent months.

The EU said the two would strengthen co-operation to:

- reach a global understanding, by the end of 2015, on the concept, basic functionalities, key technologies and time plan for 5G;
- explore possibilities in cooperating and implementing joint research actions in the area of 5G and to facilitate bilateral participation of enterprises in 5G research projects in China and the EU;
- jointly promote global standardization for 5G, in support of ongoing standardization work in relevant organizations such as the 3rd Generation Partnership Project (3GPP) and the International Telecommunication Union (ITU);
- cooperate in facilitating the identification of the most promising radio frequency bands to meet the new spectrum requirements for 5G;
- explore jointly the possibilities for cooperative research on the services and applications for 5G, especially in the area of the Internet of Things (IoT).

ZTE's D-MIMO delivers ninefold improvement at cell edge

ZTE says it has made a significant breakthrough in research on next-generation radio access networks by completing the world's first pre-commercial test of D-MIMO (distributed multiple input and multiple output) technology.

ZTE said the field test had been conducted jointly by it and a partner — which it did not name — had demonstrated an up-to-nine times increase in the data rate at the cell edge in single-user and multiple-user scenarios in an environment with multiple overlapping base stations, and using commercially-available mobile devices.

A mobile network contains many base stations whose signals can interfere with each other at the cell edge. According to ZTE, D-MIMO technology improves the data rate at the cell edge by coordinating the transmissions from adjacent base stations to minimize this interference.

"The indoor D-MIMO test result shows that the MU-JT technology can form null steering toward multiple users to guarantee good multi-user joint transmission in an enclosed and small space," ZTE said. "The service data rate of a single testing cell has been at least quadrupled in an ideal non-interference situation, and a number of testing cells have enhanced their resistance to interference by more than a hundred times.

Ericsson and Cisco forge close ties

Ericsson and Cisco have made a surprise announcement of a wide-ranging global strategic partnership. While few specifics have been revealed, the announcement suggests that the relationship will be close and far reaching.

Ericsson says it expects to generate $US1 billion or more of additional sales by 2018 and to extend its addressable market, primarily in professional services, software and resale of Cisco products. "The partnership will combine the best of both companies: routing, data center, networking, cloud, mobility, management and control, and global services capabilities," the announcement said.

In a blog post, Ericsson CEO, Hans Vestberg, said: "Cisco brings their leading position in IP and a strong presence in enterprise. We bring our leadership in mobile networks, our strength in global services, and strong relationships with the world's leading service providers."

In a joint statement the two companies said: "The multi-faceted relationship will offer customers the best of both companies: routing, data center, networking, cloud, mobility, management and control, and global services capabilities."

Together the companies plan to deliver customer value by:

- Offering service provider customers an end-to-end product and services portfolio, and joint innovation that accelerates new business models;
- Creating the mobile enterprise experience of the future through a highly secure technology architecture for seamless indoor/outdoor networks;
- Channeling the combined scale and innovation of both companies to accelerate the platforms and services needed to digitize countries and create the Internet of Things.

5G organizations to stage global events

5G organizations from Europe, USA, Japan, South Korea and China have signed a MoU under which they will jointly stage "Global 5G Events" designed to build global consensus on 5G.

Signatories to the MoU are: 4G Americas, The Fifth Generation Mobile Communications Promotion Forum (5GMF) (Japan), 5G Forum (Republic of Korea), IMT-2020 (5G) Promotion Group (China) and The 5G Infrastructure Association - Public Private Partnership (5G PPP) (Europe).

In a joint statement they said: "Due to the growing number of regional 5G events currently occurring, the parties have agreed to jointly organize two 'Global 5G Events' per year in the coming years to focus their efforts and leadership … [and] to support multilateral collaboration on 5G systems across continents and countries."

These events will be hosted on a rotating basis between the signing associations during each half of the year on a different continent between the Americas, Asia and Europe.

The first two will be held in the first half of 2016 in Asia under the responsibility of IMT-2020 (5G) Promotion Group and in the second half of 2016 in Europe under the responsibility of The 5G Infrastructure Association.

Basic areas of interest for these events include, but are not limited to:

- Vision and requirements of 5G systems and networks
- Basic system concepts;
- Spectrum bands to support the global regulatory process
- Future 5G global standards;
- Promotion of 5G ecosystem growth.

Samsung "world's most agile brand"

Samsung has taken the top ranking in a Global Agile Brand Study undertaken by brand consulting and design company Landor, beating Apple into sixth place. In the second to fifth positions were Android, Wikipedia, Google and Dyson. YouTube came seventh followed by Microsoft, Ikea, and Disney.

Landor claims that its Global Agile Brand Study is the only report ranking global brands on their agility, which it says is "the newest indicator of brand strength and financial success." It lists the six traits that help a brand be agile as: principled, adaptive, responsible, multichannel, global, and open.

"The 10 brands selected exemplify agility by consistently demonstrating these six traits in a range of market behaviors, from product development to advertising to customer interaction," Landor said. "Each brand has mastered all six behaviors, but uses them in different measures, depending on their business, market, and target audiences."

Nokia names APJ head post AlcaLu merger

Nokia today named Paul Tyler head of Asia-Pacific and Japan as part of the planned combination of Nokia and Alcatel-Lucent. He will oversee the combined company's customer operations across Asia-Pacific and Japan. He is currently senior vice president for Asia-Pacific and Japan at Nokia Networks. From 2009 to 2011 he was head of sales for the Asia-Pacific Region and prior to that was head of Australia, New Zealand and Pacific Islands at Nokia Networks. He will report to Ashish Chowdhary, Nokia's chief customer operations officer.

Nokia announced on 7 October that, following completion of the merger, its Networks business would be conducted through four business groups: Mobile Networks, Fixed Networks, Applications & Analytics and IP/Optical Networks. Nokia Technologies will remain as a separate entity within the combined company. In addition, effective after the closing of the exchange offer.

Telkomtelstra appoints new president director

Telkomtelstra, the Jakarta-based joint venture between Telstra and Telkom Indonesia, has named Erik Meijer as its new president director. He will take up the role on 1 December 2015 replacing Phill Sporton who has led telkomtelstra since its inception and who will return to Australia to join Telstra.

Meijer has spent the past 22 years in Indonesia where he has held various senior management positions in the ICT industry.

According to Telstra, telkomtelstra now employs more than 70 people in a new facility in Jakarta and has a fully operational business, a number of large enterprise customers and more than 200 sites under contract and is delivering the first phase of products and services (managed network services, integrated service management and professional services) to Indonesian business customers.

The company will release its second phase of products including managed cloud, unified communications and an integrated suite of managed security products in 2016. It also recently opened what is claimed to be Indonesia's first and only immersive customer experience centre, Telstra's largest CEC outside of Australia.

Nokia Networks names new customer team head

Nokia Networks has appointed Wayne Moulton as the head of its customer team for Australia and Asia, in which role he will "manage and nurture the company's business relationship with Telstra, with a specific focus on the designated regions." His job entails the creation of a dedicated Telstra team, which will be focused on fostering innovation and collaborative practices to tap new markets and generate incremental revenue. He joins Nokia Networks from Ciena, where he was managing director Australia and New Zealand.

ShoreTel targets North Asia with new role

Business phone system manufacturer, ShoreTel, has named Joe Tam to the newly created role of area sales manager, North Asia. He will be based in ShoreTel's Singapore office and will oversee ShoreTel's distributor and partner relationships in Hong Kong, Mainland China, Taiwan, South Korea and Japan. Prior to joining ShoreTel he was the director of business development at eBuy168.com (Canada) where he recruited and trained partners in China, Hong Kong and Taiwan. Frederic Gillant, ShoreTel's vice president and managing director of Asia, said his appointment was key to ShoreTel's strategic development plan in Greater China.

Veritas appoints new APJ channel leader

Veritas Technologies has named George Wong as its new channel leader for the Asia Pacific and Japan (APJ) region, responsible for "conceptualising and leading the APJ channel strategy that will spur Veritas to increase its customer reach and market scale across the region." He will also focus on "developing and nurturing an ecosystem of trusted partners to build capabilities in delivering innovative solutions that cover all platforms from backup and recovery, business continuity, software-defined storage and information governance." He joins Veritas from Oracle where he was responsible for the business development and partnership functions. TR

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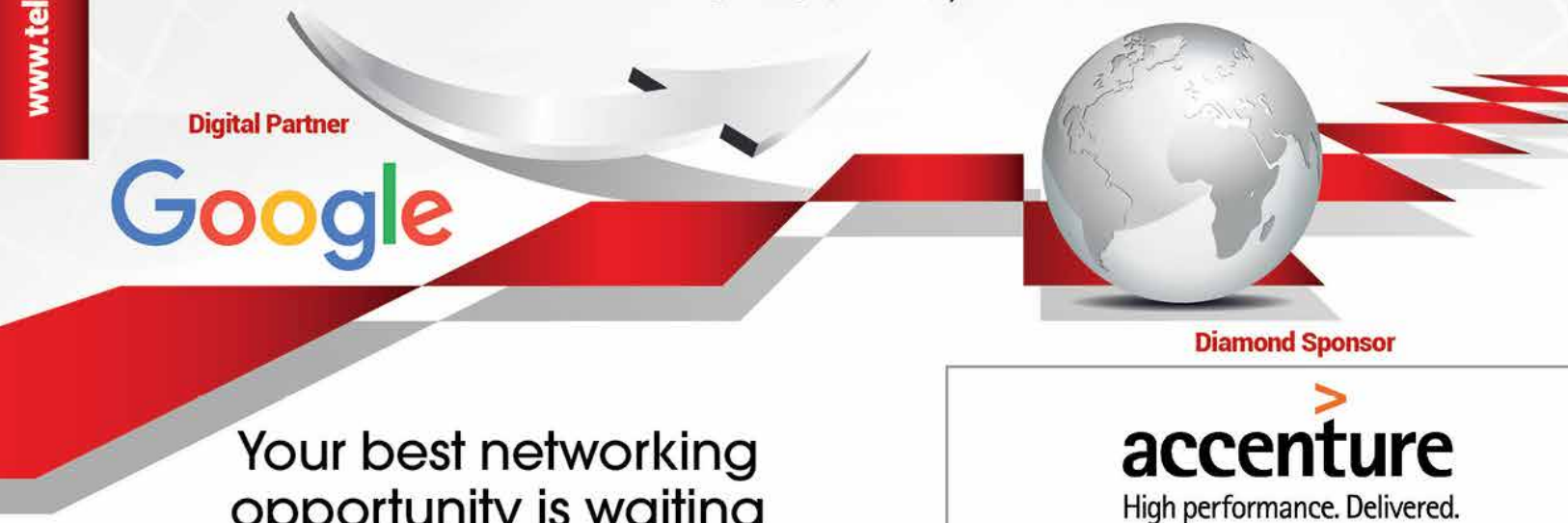

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