



## NetEvents APAC Service Provider Summit

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Immediately following that, the UK-based Net Events International also held the Asia Pacific Press Summit where these industry professionals and experts presented their findings, opinions and experiences to members of the information and communications technology media from across the region.



Ted Dean

"The year 2009 has been a challenging for the industry, as telecom revenues have slowed with operators worldwide having cut capital expenditure for 2009," said Ted Dean, president and managing director of BDA China in his opening keynote address. BDA advises investors in the telecommunications, media and technology sectors in China and India, as well as other high-growth segments.

Planned investments by major carriers in Europe were down by as much as 34% in 2009 over 2008, in Latin America down by as much as 25% and by as much as 3% down in Japan. However, recovery and opportunity are on the horizon, especially in emerging markets, in wireless and in services & applications.

"However, the Asia Pacific was the fastest growing in terms of capital expenditure and wireless services and the only region which has been growing," said Dean.

The Asia Pacific (APAC) accounted for 41% of all capital expenditure (CapEx) in 2008 compared to 29% in the

Europe, the Middle East and Africa (EMEA) region, 8% in Latin America (LatAm) and 22% elsewhere. CapEx in the Asia Pacific grew by 16.2% in 2008, followed by 10.7% in LatAm and 9% in EMEA, while it was down by 3.8% elsewhere.

Also, only APAC experienced year-on-year growth in wireless sales across five consecutive quarters from Q1 2008 through Q1 2009, while EMEA was mostly down by as much as 10% in a quarter, while growth in sales in LatAm went progressively down from strong growth of around 50% in Q1 2008 to a drop of around 50% in Q1 2009, while sales were down in all of these five quarters and by as much as over 20% in Q2 2008.

The shining stars were China and India, which respectively added between 7 and 10.5 million and between 7.8 and 15.6 mobile subscribers each month from July 2007 to September 2009 despite the economic crisis and the bankruptcy of Lehman Brothers in September, 2008.

In a particular case, growth in China Mobile's revenue in China slowed but remained positive and grew by 8.9% from 195.5 billion yuan overall in the first half of 2008 to 212.9 billion yuan in the first half of 2009.

The bulk of this was 134.9 billion yuan in revenue charges and 59.9 billion yuan in value-added business in H1 2009. Usage charges rose by 11.2 billion yuan in H1 2009 over H1 2008, while value-added business grew by 7.2 billion yuan in these two halves and only monthly charges declined by 1.4 billion yuan.

"Once it launched its restructuring plan, China Mobile's growth trend recovered," said Dean.

Among equipment suppliers, Huawei was the shining star, with it reporting US\$15.7 billion worth of orders in H1 2009, an increase of 28% over the corresponding half in 2008 and Dean believes it could come close to its target of US\$30 billion in contract orders if it maintained this momentum in H2 2009.

Huawei's growth is driven by 3G deployments in China, investments in Long Term Evolution and Passive Optical Networks (PON), Huawei benefits from government financial support with more finance from the China Development Bank over the next five years which would help it attract clients and provide a reliable and inexpensive source of capital for growth.

The fourth driver is carriers' cost control strategies, where carriers are centralising their sourcing of equipment from countries or regions with low tax rates so they can reduce their procurement costs and tax expenses while benefiting from low price vendors such as Huawei.

China is building three 3G networks worth US\$60 billion between 2009 and 2011. They are a Wideband-CDMA (WCDMA) and a Time Division-Synchronous CDMA (TD-SCDMA) network, both of which will cover most cities in 2011 and a CDMA EV-DO network which would cover the country in 2010.

Global expenditure on LTE networks began in the latter part of 2009 and will continue to grow over the next two to three years. Verizon Wireless planned commercial LTE launch in the U.S. in the fourth quarter 2009, Russia is expected to follow this second quarter, while other operators in the US, Japan, South Korea and Romania plan LTE launch this coming fourth quarter.

CapEx on LTE will be exceeded US\$8 billion over the next five years, with NTT DoCoMo having announced expenditure of US\$4 billion to install 20,000 LTE base stations covering over 50% of Japan's population, while China Mobile will build a pre-commercial field test of TD-LTE (Time Division-LTE) in Shanghai this year.

"Global investments in PON will surge over the next few years and Huawei is well positioned to benefit from this both in China and abroad," said Dean.

Global PON (fibre-based passive optical network) sales are forecast to grow at 20% compound annual growth rate (CAGR) from 2007 to US\$5.2 billion in 2013, while Gigabit PON (GPON) will replace Ethernet-PON (EPON) in fibre networks, including to the home. EPON which also supports gigabit speeds employs the Ethernet protocol, while GPON supports multiple Layer 2 protocols including ATM (Asynchronous Transfer Mode), GEM (GPON Encapsulation Method) and Ethernet, as well as greater security.

Huawei is the world's largest GPON supplier and the largest in China in 2008 with 40% market share, followed by ZTE with 35% and with increased credit line from the China Development Bank, Huawei will be able to finance its customers with loans to buy its equipment.

For example, in 2007 Huawei funded its customer Reliance in India with a loan worth US\$750 million to fund its GSM network rollout and that same year it funded Play in Poland to the tune of 640 million euros for its 3G rollout and in 2009 it funded Russia's MegaFon with US\$300 million for its wireless network rollout.

Huawei ranked fourth in telecom equipment sales in 2008 after Ericsson, Nokia Siemens and Alcatel-Lucent. Ericsson's sales was worth US\$27 billion that year, while Huawei's was US\$15 billion. However, Huawei is expected to leapfrog the latter two to second place after Ericsson, mostly from its sales to emerging markets.

However, Dean expects Huawei to remain in second place, though it will become one of the top three equipment suppliers in Europe after dominating emerging markets. Huawei is expected to become the world leader in wireline equipment, displacing Alcatel-Lucent and provide powerful competition to Ericsson.

However in the softer department, Huawei is expected to continue to lag Ericsson, Nokia-Siemens and Alcatel-Lucent in professional services.

Huawei's profit margins will improve as it competes on product quality rather than price, while rival ZTE will continue to compete on price, though Dean does not expect this strategy will work in the developed markets.

### **Getting ready for LTE**

Tim Dillon, AVP research, IDC chaired the fourth conference debate – Getting Ready for LTE (Long Term Evolution), while the panelists were Kevin Vachon, chief executive officer of the Metro Ethernet Forum (MEF), David Gehringer, vice-president Marketing at Fanfare Solutions and Natasha Tamaskar, vice-president of Marketing at Genband.

“The biggest driver for telecommunications companies is how services are growing and the number of new broadband services in the Asia-Pacific excluding Japan (APEJ) is growing, driven by embedded devices such as notebook & netbook PCs, wireless modems and smartphones,” said Dillon in his opening speech.

Findings from IDC Fixed Line, Mobile Wireless and Carrier CapEx Tracker reports show the number of HSPA (3G High Speed Packet Access) subscribers across APEJ region growing more or less at a linear rate from around eight million in 2007 to around 29 million in 2009 and projects around 51 million subscribers in 2012.

Over the same period, the number of Internet protocol TV subscribers will grow, also in linear fashion from under five million in 2007 to around 25 million in 2012, while the number of WiMAX subscribers will grow more sedately but in a somewhat exponential fashion from about one million in 2007 to three million in 2009 to around 15 million in 2012.

Monthly mobile voice ARPU (average revenue per user) will remain flat or even fall slightly in several countries across the region with the exception of Singapore where it has hit bottom at around US\$20 in 2009 and 2010 and will rise to around US\$22.50 in 2012 though no reason was given.

Voice ARPU differs hugely in the different countries, with lows of around US\$2/mo in the Philippines to a high of around US\$25/mo in Australia.

On the other hand, data ARPU is growing in all countries across the region, with the exception of India where it will remain flat and low at around US\$1/mo between 2007 and 2012.

However, in most countries, data ARPU still lags voice ARPU over the period. The biggest growth in data ARPU, as well as quantum is in Australia where was around US\$8/mo in 2007 and is projected to grow to US\$25/mo in 2012, with 80% driven by the mobile broadband business, with the rest driven by replacement rural dialup and satellite access.

South Korea and Singapore have data ARPU within the US\$5/mo to US\$10/mo band over most of that period, with Singapore's data ARPU projected to rise to around US\$12/mo in 2012. As for the rest, their data ARPU will all be below US\$5/mo over that period, with the exception of China's which would reach US\$5/mo in 2012.

While the smartphones such as the Apple iPhone 3G were found to have driven mobile data traffic up by as much as 200% in Europe, they will no doubt exert a similar affect at least in the more affluent countries in the region.

### **Rise of machines**

Nortel figures show growth in machine-to-machine data traffic, which began to increase somewhat exponentially from almost zero normalised traffic in 2005 to around 42 in 2012, while person-oriented data grew in somewhat linear fashion from a normalised figure of 2 in 2001 and is projected to reach around 23 in 2012 and when combined, overall data traffic will reach around 65 in 2012 and all this places demands on network capacity.

"However, in this regard, 3G LTE will be part of the solution," said Dillon.

Recent LTE trials by Verizon Wireless in Boston and Seattle have achieved average downlink speeds of up to 10Mb/s and average uplink speeds of up to 2 Mb/s. Peak speeds achieved were up to 50Mb/s and up to 20Mb/s downlink and uplink respectively.

Telstra also began LTE trials in 2009, while Century Tel, NTT DoCoMo, KDDI, Rogers Wireless, Telus, Bell Canada, telecom New Zealand and TeliaSonera in Sweden and Norway will conduct trials in 2010. Other big operators including AT&T Mobility, T-Mobile, Orange, China Mobile, China Telecom and Hutchison 3 Ireland are scheduled to begin LTE trials in 2011.

However, speed isn't the only benefit. Rather it's the cheaper cost per megabyte over mobile data. Cost per megabyte ranged between US30 cents and US\$20 with 2, 2.5, early 3G and HSPA networks but as 3GPP UMTS technology evolves through LTE into 4G systems between 2012 and 2015, also known as IMT-Advanced, per megabyte costs will fall to between US1 and 7 cents, according to IDC.

### **LTE vs WiMAX**

LTE will initially take off in high GDP (Gross Domestic Product) markets with broadband penetration between around 24% and 37% of the population, mostly in Europe as well as Hong Kong and South Korea, while WiMAX

will initially take off in low GDP markets where broadband penetration is below 5% and all emerging markets where LTE will only be relevant from 2015.

The APEJ region had around 100 million 3G and over 25 million HSPA subscribers in 2009 and these are projected to grow to over 250 million and around 50 million in 2012. On the other hand, WiMAX subscribers in India 500,000 in 2009 and are projected to grow to around 3.4 million in 2012.

“Besides addressing capacity pressures on 3G, LTE will also enable mobility, while WiMAX addresses underserved capacity demand and its value proposition is portability but LTE will not kill WiMAX,” said Dillon.

However, like with WiMAX today, LTE will face problems of a short range, especially with its use of 64-QAM (quadrature amplitude modulation) and it will also face similar problems penetrating walls, especially at high frequencies such as 2.6GHz but the use of femtocells would be a solution.

“The increased bandwidth will give rise to killer apps and the benefit of LTE is its backward compatibility with 2G networks, since if phones don't work, users will complain to the operator,” said David Gehringer in the panel discussion.

“Mobile voice ARPU is dropping due to infrastructure costs because of customers who are unwilling to pay such prices and especially those in North America tend to go for the cheapest prices,” said Natasha Tamaskar.

However, the money will be made on the sale of mobile applications rather than the volume of data transferred.

As for the future, 4G networks will be pervasive networks that provide ubiquitous broadband, peer-to-peer and “aware” wireless access to the Internet via IPv6 (eventually) and is an extension of the fixed line planetary information grid.

4G services will be multi-rate, informational, and multimedia wireless services that provide end-user devices/sensors with access to other authenticated, authorised peer-to-peer nodes on the planetary grid.

4G radios will support data transmission rates up to 1 Gb/s per user for short-ranges (100 meters) transmission and from 5 to 100 Mbps to multiple users at longer distances from 1 to 10 Km.

Many 4G base stations and some end-user terminals/devices will have the added feature of being reconfigurable and/or cognisant radios through the use of wideband (400 MHz – 6 GHz) software defined radios (SDRs) technology.

### **Key radio technologies to watch**

Key radio technologies to watch include, Ultra-Wideband (UWB) with a range 1 meter, MIMO (Multiple Input Multiple Output), Advanced Radio Chipsets for handsets and dongles that incorporate MIMO, Adaptive Antenna Systems (AAS), Smart networks (sector load balancing, spatial/freq/time load balancing, self-tuning, dynamic resource management), Network MIMO & Heterogeneous Deployment (Pico+Micro+Femto), Orthogonal Frequency Division Multiplex (OFDM) used in xDSL, WiMAX, WiFi 802.11a,g; LTE, spectrum flexibility including software defined radios (SDRs), base stations, and customer premises equipment (CPE), and cognitive radios

Spectrum flexibility includes flexibility in band-of-operation, flexibility in bandwidth, dynamic spectrum usage, reconfigurable radios and cognitive radions and flexibility in duplexing ie. between Frequency Division Duplex which uses paired spectrum and Time Division Duplex which uses unpaired spectrum.

## What does Green IT really mean for the enterprise?

Being based in Beijing, Ted Dean is exposed to its legendary haze and persistent air pollution, often associated with energy intensive heavy industries such as iron, automobile and coal burning plants – ill- side effects which has have plagued many industrial nations of the West in the past.

However, while seemingly clean and white collar, the ICT industry is no angel either.

“If you spend a significant time online maintaining your Second Life avatar, you’re using the same amount of electricity as the average citizen of Brazil. So for every thing that one person in Brazil does all year long, you’re consuming the same amount of electricity maintaining your Second Life avatar, which is significant power consumption,” said Dean.

Studies worldwide have shown ICT energy consumption and then by extension carbon, CO2 emissions, to be at about 2% or 2.5% of the global total, so it is a significant industry in terms of energy consumption and a significant industry in terms of CO2 emissions.

So the question is whether companies want to become green due to genuine concerns for the environment or just to save costs. It's an area which can be looked at in terms of driving down power consumption and energy costs, while also reducing the company's carbon footprint.

“Moreover, we could go in a lot of directions talking about a green IT. Obviously the IT industry itself and we as consumers of IT, products and services want to look at how we can reduce the emissions in those activities, while at the same time, the IT industry provides all sorts of solutions that can make us more efficient and more productive and may reduce our emissions in other things we do,” said Dean.

“For example, we can pick up the phone instead of driving over to see someone, we can use telepresence instead of flying to attend a meeting. We can also look within the datacentre or within the desktop computing environment, at what we can do to reduce energy consumption and reduce CO2 emissions,” he added.

The panelists were Christopher Steffens, director, Telepresence Public Room Services, Tata Communications; Bob Mandeville, president and founder, Iometrix; and Tim Dillon of IDC.

IDC is an industry analyst, Tata Communications provides telepresence (ie. high-end video conferencing) rooms and Iometrix is a certification test laboratory of the MEF.

Bob Mandeville, Christopher Steffens and Tim Dillon

That morning (19th Nov, 2009), IDC had just released results of a global green IT survey of 1,600 chief information officers for global enterprises about the technology issues they were looking at and the biggest issue cited by around 60% of them was their company's energy efficiency from an ICT perspective.



For example, power charges for businesses in Australia are expected to increase by between 30% and 50% over the next three to five years and this would impact the operational costs of data centres and anything which can be done to achieve greater efficiency in power consumption would have benefit for two reasons.

First is the cost perspective in the Australia and New Zealand context, which is especially critical in light of the current financial scenario.

Second is that datacentres in Australia are running at the limit imposed on their power consumption and cannot even add another server rack, so they must improve their power efficiency to be able to deploy more solutions, initiatives or whatever.

“Bob, you’re talking about measuring the efficiency and I don’t think organisation really have approached this, that they haven’t really thought about it from that perspective,” said Dean.

“Well first of all you have to define metrics but you have to frame the metrics in terms of the problem and the industry does have a problem that governments today are paying a lot of attention to. For example in Europe EFSI and the European Commission are starting to steer their attention and their intentions towards regulating the amount of power that a service provide in Europe can consume to furnish a broadband customer with broadband,” said Mandeville.

The Environmentally Friendly Software Initiative (EFSI) in Europe and the American National Standards Institute (ANSI) in the U.S. are both developing metrics that address this issue. For now they are not identical but there’s very strong pressure from vendors for them to harmonise their standards, so they don’t have to build to meet two different standards.

There are several efforts and initiatives in this direction and lometrix had built a very substantial test bed, while Angus Robertson of Spirent who was on the previous test bed had supplied lometrix with test centre equipment which allowed lometrix to scale up to 256,000 subscribers and run them on PPPOE (Point-to-Point Protocol over Ethernet) services, one MPLS (Multi-Protocol Label Switching) layer to VPN (Virtual private Network) services and on VPLS (Virtual private LAN Services) so lometrix could compare and contrast.

“We were able to scale from zero to 256,000 subscribers and to scale from very small loads, that little drips of traffic going through on the one hand and all the way to full load on the other and it turns out it was close to 100 Gb/s of traffic. We then measured the energy efficiency and built a whole bunch of tables to compare and contrast,” said Mandeville.

lometrix found some metrics such as milliwatts per Gb/s to be primitive, since large switches and routers have a control plane which does some really heavy-duty work managing 256,000 subscribers, which is much more than just passing a lot of traffic through.

“So what we were trying to pinpoint was to isolate energy efficiency in so far as the data plane was concerned and as far as the control plane was concerned, and hope to contribute to the work that’s ongoing,” Mandeville added.

As for easy ways to reduce power costs, IDC found by talking to data centre administrators that about one in 20 of servers are idle and can be turned off and the simple way which many organisations don’t use is to enable is to enable their power management functions which can yield very quick gains and this approach could be employed anywhere, such as in an office and not just in data centres.

With today’s dispersed workforce, where colleagues collaborate from different countries and don’t see each other sometimes for over a year, Tata Communication’s Telepresence solution, based very much on Cisco’s telepresence systems can help colleagues attend realistic meetings virtually.

For example, both corporate travel management companies American Express Travel and Carlson Wagonlit Travel have integrated Tata's telepresence solution into its traditional travel packages, including plane, rail and car, driven by its own corporate clients who have realised the benefits in terms of efficiency and productivity in using teleconferencing systems.

So these two travel companies now recommend whether a meeting should best be conducted virtually or in the flesh, depending on the level of employee and other factors.

"Telepresence is the most efficient way, and they're even looking at it by level of employee, by type of meeting, what's the optimum way. Is it a face-to-face meeting, is it telepresence or is it voice," said Tata's Chris Steffens.

As for energy consumed during telepresence sessions, Steffens said that there are numerous constituencies looking at that right now.

"One of the figures I've got from Cisco is about 64 kilograms per hour of CO2 emissions, for a CTS 3000 telepresence room, and this is issues still being looked at by a number of different constituencies.

"For example, if you eliminated five trips and replaced that with say 14 hours of telepresence there might be a net benefit of about 1000 kilograms of CO2 emissions saved, which is around 20,000 trees," Steffens added.

"This is actually the last NetEvents event that I'm going to attend in person to but I will be beaming in from a Tata telepresence centre somewhere in Asia for next time," said Dean.

### **Smart grids and networking**

Smart grids and the role of networking technology as an overlay of electrical power grids will soon be a hot.

"Power distribution today is largely unintelligent. The power grid, the grid that is responsible for the transmission of power between the sources which could be any – well today are relatively primitive, to the ultimate consumers is not intelligent. And so we're taking baby steps today in inventing the smart grid," said Mandeville.

The smart grid has a lot of work to do. It has amongst other things the task of intelligently bringing power in from many new sources that have fundamentally different characteristics.

Batteries can store power, that's a very unusual new characteristic and power can not only be taken off the grid but also put back on to the grid from homes and residences over night. That requires a huge amount of intelligence which can only be laid on top of the intelligent power grid with the significant involvement of the networking industry, so telecommunications networks will have to bring all of their know-how to become an overlay of the smart grid, or onto rather the smart grid.

"Very early meetings are beginning to take place between exploratory groups within associations, that are coming together and trying to bring or rather create discussions between very different communities, which hitherto aren't used to integrating their technologies together, and the media, especially the networking media should pay attention to this development which could well be as significant a revolution in power distribution as the Internet was in IT." Mandeville added.

### **Are low powered, low heat motherboards enough?**

"Manufacturers like Hewlett Packard and Sun have been developing servers and related equipment which

consume less power and generate less heat, so as to reduce overall power consumption and heat load on air conditioning systems but even then, there are opinions which hold that it's not going to be enough to reduce power and air conditioning costs," said *Comm & Tech Asia*.

At the same time, microprocessor manufactures such as Intel have developed the Pentium M and Core Duo processors for lower energy expended per instruction (EPI).

According to paper by Ed Grochowski and Murali Annavaram of Intel's Microarchitecture Research Lab in Santa Clara, desktop microprocessors were expending large amounts of power for relatively small improvements in scalar performance.

Relative to the Intel 80486 processor used as a reference, the 65nm technology-based Pentium 4 (Cedarmill) processor delivers 7.9 times the normalised performance of the 80486 but consumes 38 times more the normalised power, while the also 65nm technology-based Core Duo (Yonah) delivers 7.7 times the normalised performance, which albeit is marginally less but it consumes only eight times the normalised power, through a lower EPI of 11 nano Joules per instruction versus 38 nano Joules per instruction with the Pentium 4 and this translates into both power consumption and heat.

In many ways, data centres face the kind of dilemma humorously featured in an old copy of *MAD Magazine* where the wife complained that the heating in the home was too high and the husband said, "well turn on the air conditioner, honey."

"Server and related equipment inevitably consume power and generate heat, which has to be removed by air conditioning which in turn consumes power in doing so, which presents a double whammy," *Comm & Tech Asia* added.

"Well, the good news is that you can try to progress at many point of the chain, so companies way up the value chain, like Intel for instance are working on this, while down the value chain somebody's thinking about whether the airflow in their data centre could be better, how to configure their air conditioners or whatever else it is," replied Dean.

### **Cloud computing not quite there**

Moving on to datacentre transformation and what's called by the latest buzzword as "cloud computing," -- basically centrally hosted applications accessed via the Internet from thin clients, usually a web browser or a piece of client-side software.

"While there are many service providers and technology providers offering their new fangled services and technologies, however I've seen the mediocrity of actual experience when it comes to the implementation of certain technologies," said Camile Mendler, vice-president for Global Service Strategies, the Yankee Group, who chaired the debate.

There is a high standard to meet to convert enterprise ICT (information and communications technology investment) to the new type of operational model that cloud computing proposes and enterprise IT (information technology) is always under some level of pressure because of market issues, economic issues and a changing business culture.

However, the reality is that there's not necessarily more money available for enterprises ICT budget but instead, it's about shifting investment away from datacentres, hardware, services, professional services and so on to this

new operational model – ie. cloud computing – which basically represents a shift away from capital expenditure (CapEx) to operational expenditure (OppEx).

Without going into the definitions of what cloud computing involves, Mendler provided a view of the different layers and the services which they address. For example, the virtualisation layer refers to the datacentre infrastructure, which supports the delivery of these different services, be it infrastructure as a services (IaaS), platform, or software as a service (PaaS or SaaS) and there's also the need to provide security, compliance and governance around those different services.

However, while that all sounds good and like a nice idea, the reality is something else.

The Yankee Group surveyed enterprises for their motivations behind adopting one or more of these cloud services and found that most of them are motivated by cost reduction, management agility, business agility and once again, the transference from transferring CapEx to OpEx.



Camille Mendler

“The reality in terms of delivery of those types of services to my mind is a Cloud vendor community that is adolescent in its approach. It’s cliché, squabbles over things such as standards, service definitions and having spent some time on Twitter, the discussion is focused on the technology and not the paying consumer and there’s a lot of immaturity,” said Mendler.

“Some of the common failings around cloud computing are trust, transparency and professionalism, and I say this as someone who has audited almost 50 different cloud vendors contracts, their service level agreements, their privacy conditions, the contractual terms and the gap that exists today in terms of cloud computing contracts are considerable.

“Enterprises are certainly wise to some of the realities of the cloud service availability and results of this survey show that they want service level agreements around network and applications, redundancy of the

connectivity, redundancy around servers, back up but none of this is guaranteed contractually by cloud vendors,” Mendler added.

It’s important to realise that with a cloud services, one is not buying anything physical but a license to use a services and the term “as is” is important legally, since customers aren’t getting any warranties and while cloud computing is trying to displace some existing methods of doing business, yet it adopts much of the legal environment from software to disavow much of its contractual responsibilities, so customers are buying a license with very few guarantees in terms of the support they get.

“As an example of the general standard of the cloud business, a major IaaS provider called GoGrid heavily markets the fact that they provide a 10,000% service level agreement (SLA), so if the service is unavailable for 15 minutes the customer gets a services credit of 15,000 minutes which sounds great until it looks at the details of the contract and finds that irrespective of how many failures it suffers, it will only get a maximum of two months

credit,” said Mendler.

“With another company, SalesBoom, customers cannot get any type of liquidated damages for any problems that may occur in the service. It’s the customer’s problem and its sole recourse is terminating the contract or some level of service credit, so its risk and its alone, as well as risk from the legal perspective.

“Also, the regulatory perspective and the privacy perspective around cloud computing is unexplored territory as laws and regulations did not anticipate cloud computing and are very unclear, irrespective of the jurisdiction one is in, how laws should apply to data in the clouds, moving between clouds, the involvement of third parties and cloud computing vendors again are trying to disavow any responsibility in these types of areas.

“Also, customers will find that very few that have actually gone through and gotten any level of certifications around security compliance and very few cloud vendors can claim that they have any of these types of certifications in terms of quality processes, security and service management and data protection.

“Verifiable assurance when it comes to Cloud computing is not there yet and even on the issue of data backup don’t assume that that cloud vendor has actually backed up your data, in most cases they haven’t, the responsibility again is yours, so there are all sorts of issues that need to be addressed and it’s a black hole.

“It’s my personal view, that comparing telcos with non-telco vendors and what they’re providing in the cloud, I think that telcos could actually have a potential to fix some of these problems and telcos need to respond to the Cloud environment, partly because they’re being disrupted by cloud players, whether they be Amazon or Google or some of the SaaS players who are effectively challenging telcos on the peripheries of the market.

“Telcos have a role to make the cloud work a lot better and their role is to be a trusted intermediary for the cloud, not a broker of service. Telcos can be a single contract, a single SLA and allow enterprises to swap between cloud vendors based on whatever rules of cost, governance and risk the enterprises might want to establish.

“Already some telcos are moving into this space, including BT and Deutsche Telecom, while in Asia, companies like SingTel and NTT potentially have got some of the assets to provide that intermediary role and they are going to have to work with several vendors to achieve that, including third parties which provide IaaS,” Mendler added.

Kevin Vachon, Angus Robertson, Ami Nissimov, Roark Pollock & Fabrizio Civitarese

The panellists were Fabrizio Civitarese, vice-president Asia Pacific for Reliance Globalcom; Roark Pollock, global director of Product Marketing, TippingPoint; Ami Nissimov, vice-president of Managed and Software Services - Global Services Division, ECI Telecom; Kevin Vachon, chief operating officer, MEF; and Angus Robertson, director, Spirent Communications.



“We don’t want to be caught in the big hype that there is in cloud computing and then lose focus on what is our mission, especially with regard to the enterprise market that needs to provide high quality services to the enterprises as there’s an opportunity to grow our business using this new wave of cloud services but we position our self in the collaboration space with the cloud providers to provide enterprises with a network solution that will enable them to run mission critical application in the cloud,” said Civitarese

“The biggest issue is just helping the market understand what is cloud computing and in defining what the different services are that are available,” said Pollock.

“From a security standpoint, the biggest issue is not necessarily the technology and most of the technologies for cloud computing and virtualisation are evolving very quickly.

“However, it's the business issues which are behind it. In a hosting environment like cloud computing, there's a shared responsibility for the security, so the contracts make up for that. Questions to ask are is it defined, who's responsible for what from the security standpoint, what's the provider responsible for and what's the end user responsible for?

“So contractually, there are some major issues around making sure that security is actually accounted for, that the audit measures are in place, that companies that are going to use cloud computing services have in place ways to ensure that they're compliant to regulatory requirements that they need to be compliant with,” Pollock added.

On making cloud vendors more professional, Civitarese said, “Enterprises need find a service provider that is responsible as most cloud services being provided now happen in a no-man's land where nobody knows where the responsibility is and a lot of companies can add their value in taking away the no-man's land and providing their infrastructure, the service of the cloud.”

On testing, Robertson said, “We see dramatically more complexity and scale in cloud enabled datacentres, so instead of having perhaps a hundred blade servers with a gigabit uplink using 5% of the network, now on that same 100 blade servers you'll have 2,000 virtual servers with 10-gigabit uplinks, hence dramatically more scale and complexity, the need for testing comes in.”

“Also as current contracts don't provide for much, an enterprise wouldn't want to be locked into a cloud service provider however low their charges but the technology enables the migration of virtual servers out of the private cloud and into the public cloud and as there's more standardisation around that as well.

“There'll be more competition as customers move virtual servers from one cloud service provider to another cloud service providers, which will put pressure on cloud vendors to provide better contractual agreements,” Roberston added.

### **Monkeys for peanuts?**

“Assuming we realise that level of cloud portability, you've got to really think about whether the savings you're going to make on one hand are going to be more than compensated against the business risk you're taking on board as a result. Basically, will you be paying peanuts to get monkeys?” asked Mendler.

“Also, let's not forget that whilst a lot of the cloud developments and investment is around the datacentre, it's going to have to be around the network as well and in terms of the growth of networking, high speed networking and high performance networking environment, there's a lot of planning that I think Telcos need to support the data interchange and a variety of other things,” she added.

“Actually I can see it's the more technology that drives the business model than the business driving technology,” said Ami Nissimov. “The next generation of the cloud will have more services around the cloud, managing what services the customer is going to get or more specifically, designing what performance or what SLA the customer is going to get out of this cloud,” he added.

Rather than providing best effort service, cloud vendors will provide customised service levels in terms of performance, how they will be achieved, the design of specific areas around the clouds and what the customer will get from it.

### Management and security in the cloud



Vidya S. Nath

Vidya S. Nath, Senior Industry Analyst, Digital Media, Team Leader, ICT, Frost & Sullivan moderated the debate on management & security issues of cloud computing.

The term “cloud computing” is generally understood to mean centrally hosted applications accessible online through a thin client such as a web browser and quite often provided as a subscription service, which is an operational rather than a capital expense.

However, even till today, there's no clear perception as to what cloud computing exactly is.

“So, as you can see that the concept of cloud computing is still very blurry, everybody has their own perceptions. The industry has defined it in a number of steps that it could be offered as infrastructure as a service, platform as a service, application as a service. But when a service provider or a vendor enters the office of an enterprise customer they have their own concepts. And the vendors have, unfortunately or fortunately, added to that confusion and evolved it a number of solutions in the space, which are not exactly cloud computing but are related to cloud computing. So over-time it has evolved as concepts around private clouds, virtualised private clouds so on, and so forth,” said Vidya.

However, despite its cost advantages, there remain challenges to its acceptance, especially among large enterprises which are extremely risk averse, especially with regard to their content protection and they regard security as the number one risk. They're also concerned the privacy of their data on a shared network, especially when it subject to governing rules of national governments, industry bodies and others which could demand access to it.

The final issue is who's responsible for security and confidentiality of their data – is it the service provider which hosts the data, or is it the customer.

“It's been heard that there have been some instances of breakdowns in the recent past with respect to cloud computing, not only security-related but to other causes such as power outages and performance-based issues which have compounded the perception of the riskiness of cloud computing on an enterprise's business,” said Vidya.

Customers are asking whether if they are in a shared environment and if there is a security threat intended for another enterprise, is it going to cause a breakdown to their data and other such concerns.

Also, cloud computing appears to be very attractive to small enterprises in the United States, which are trying to adapt to it quickly but this could be a problem for their internal IT departments or for IT security within their

organisation.

These issues include identity and access management, data encryption, data compliance, interoperability, virtualisation, security, risk management, network breakdown, infrastructure reliability and shared servers.

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Eu Ween Kang, Stephen Hopkins & James Collinge

Vidya threw the issue to the panel, which comprised Eu Ween Kang, enterprise marketing director, APAC, Juniper Networks; James Collinge, director of Product Line Management, TippingPoint; Stephen Hopkins, head of Business Development, Business Continuity, Security & Governance Practice (BCSG), BT Asia Pacific.



“What are the priorities customers should have when it comes to security?” asked Vidya.

“These security concerns are real but cloud computing a range of infrastructure application business process outsourcing, which the industry has been delivering for many, many years, so a lot of the issues are common. So if you have experience in working with other service providers and most large enterprises do, then you have some preparation for the issues that you are likely to encounter with cloud computing,” said Hopkins.

The key things are issues like privacy, protection of information, availability of services, service provider's ability to recovery in disaster scenarios, the physical security of the equipment and the premises that they use. These are all common to outsourcing, but cloud computing brings some particular nuances.

So, for example, in relation to legislation and regulations for data protection around individuals, if you are processing data that pertains to people coming from places like Japan or Australia, Hong Kong or the European Union then there are specific laws about how you are allowed to process and handle that information.

However, the challenge for Cloud Computing is will you ever actually know where that data physically resides, because you can process it in certain jurisdictions. So that's one of the nuances, another one is around e-discovery or legal challenge. Will you ever know where the information that you require actually sits, and will your provider be able to gather that information for you in a timely manner.

“You were discussing earlier in the morning when we were talking about this topic that the onus is on the customer also to find out what is the check list that they should look into with respect to security in the SLA. So, who actually determines what is the check list, because there is a lot of reference points here for them to consider<” asked Vidya.

“We tend to find people want absolute answers, but they want to deal in black and white. Questions like what's the most important security feature that we have to consider when we want to use cloud computing. The reality is there is no black and white answer to this. There is a real shared responsibility between customers of cloud computing providers but also the service providers themselves,” said Hopkins.

So the most fundamental important thing is that before an organisation embarks on a journey to take cloud services they really need to fundamentally understand the nature of the IT applications, the business processes or the data that's going to be handled by a cloud provider. It's very important to say well, what's the business

barrier of this thing that we are effectively outsourcing? Does it contribute to revenue streams? Does it bring us cost savings?

There needs to be dialogue between IT and the business to really ascertain what are the business impacts if we have a loss of confidentiality or integrity or availability in these processes, applications or data, because that's the starting point for the conversation with the service providers.

You can go out and do a Google search for check lists of security things that are important, but what's important for one customer is not important for another. So, for example, if you're bound by PCI compliance you'll have a different set of requirements to a customer that isn't. So it's really dangerous to talk about absolutes.

So you must understand what you are trying to outsource, understand the barrier of that to the business, engage with the business in conversation to say what are the impacts, involve your legal regulatory and compliance department, because they will have specific views about absolutes that you must attend to, and then you can start pulling in these various check lists that are publicly available and build your list of requirements on must-haves and nice-to-haves.

If a service provider can't meet the absolute must-haves then you need to filter them out and find the ones that can meet your requirements and if you find the situation where cloud providers can't meet those absolute requirements then you can look to fall back to premise-based services from service providers who may have a higher level of maturity and be able to offer you the absolute assurances that you need.

"However, the point of that most of the technology decisions lie in the hands of the IT department, so how do you actually try and bridge the gap, and allow the -- impress upon the customer the need to bring the business advocates on board?" asked Vidya.

"That's not specific to cloud computing as that's the age-old securing of any critical business asset and what we've seen is typically if they don't have senior management buying in for any type of security-based solution or mitigation strategy then it's likely that it probably won't work," said Collinge.

"Just to add, I think the dialogue between business and IT people in the business happens, but the IT people remain heavily involved. It's not so that they don't feel threatened but they will tend to think that is a trap with their own job," said Eu. "So the dialogue that happens must help the IT department ascertain where they play a role in cloud computing and I also understand that this is important like just to emphasise the one that Stephen said, I think I believe that Cloud Computing will not go in a way where an organisation will outsource everything to cloud computing and do everything in the cloud."

It depends on the business and the fundamentals of the company as well. Small-medium business (SMBs) typically want to outsource everything to a provider because they don't have resources to manage data and security, so they go for the cloud.

On the other hand, data typically becomes very critical for large enterprises, so for them it would be a hybrid model, such as a private cloud service which the enterprises owns and operates itself to provide cloud services to its employees and associates.

"How about a simple application like e-mail which may not be resident on the enterprise's own server but on a shared server in a data centre and you can access it bypassing the enterprise server through webmail," asked Vidya.

“Email is probably the second most important application in an enterprise environment after voice, so organisations should ask about the availability level of the email service since its downtime means money,” said Hopkins.

“So customers must ask how well protected is their information that's flowing through that off-site email service, their rights to privacy when a service provider is handling their email, what does it do with them, will it use it for marketing purposes for example and what are the implications for the service provider in case of privacy breaches,” he added.

### Carrier Ethernet Exchange



Nan Chen

The Ethernet market is moving and providers are investing in Ethernet gear, according to Nan Chen, founding president of the MEF as well as president and chief executive officer of CENX, Inc (Carrier Ethernet Neutral Exchange).

According to Infonetics Research, providers will invest a total of US\$146 billion between 2008 and 2013, while revenues from Ethernet services will be in the billions of US dollars worldwide.

Many non-Ethernet services are being offered and more are planned over Ethernet, with multiple types of services such as voice, video, data, storage, security and EPL (Ethernet Private Line) carried over all packet-based Ethernet networks and service providers are increasing their network capacities to provide connections for businesses, broadband for consumers and backhaul connections for mobile traffic.

Enterprises are using networking to transform their businesses and see Internet Protocol (IP) -based communications as a means to improve their revenue, operations, profitability, and their customers' experience.

They're also planning to use it to consolidate their fragmented legacy networks onto a single IP or Ethernet-based network.

Ethernet global interconnect service revenue will grow from US\$220 million in 2009 to US\$4.7 billion in 2013, while total Ethernet interconnect service revenue - ie retail, wholesale and global – will grow from around US\$16 billion in 2008 to around US\$38 billion in 2013.

The first phase of Carrier Ethernet began with its specifications in 2001 and it was defined in 2004 and this phase will continue into 2010.

Its second phase began with MEF certification programme and large scale deployment from 2005 into 2010

Under its third phase, global interconnect specifications and certification tools begin from 2008 and will continue into 2014

CENX announced the world's first carrier ethernet exchanges in Los Angeles, New York and Chicago on 19 November, 2009 and these will allow interconnection of multiple services between telcos worldwide, including

Telekom Malaysia.

## **100Gb/s Ethernet**

Many still say that 100Gb/s Ethernet is overkill while many are still migrating to 10Gb/s Ethernet but a recent CIR report found large Internet-based companies such as Google and Amazon.com already need 100Gb/s bandwidths, so it's current high price during tough economic times won't be a deterrent to its adoption.

Some say why adopt 40Gb/s Ethernet when 100Gb/s is on the way but CIR predicts that 40Gb/s Ethernet adoption will first be used to connect high end servers and high-performance computing applications and 80% of the market will be 40G Base-SR4 until 40G Base-CR4 over-copper becomes more viable. However, their use will make way for serial 40Gb Ethernet becomes a reality in 2014.

In 2006, a High Speed Study Group decided that two speeds were needed - ie 40Gb/s for server and computing applications and 100Gb/s for network aggregation applications.

In his presentation, Transition to 40/100GbE ... and beyond?, Matt Walker, principal analyst, Network Infrastructure with technology analyst firm Ovum cited the NTT technical journal of March 2009 as saying, "A notable feature of 100G Ethernet standardisation is that for the first time the data rate for wide area networks has fallen behind that of local area networks."

However, the International telecommunication Union is working on the ITU-T G.709 standard which will rate optimise and otherwise conform OTU4 to the IEEE's 100GbE when it is finalised in mid-2010. OTU1, 2 and 3 correspond to STM-16, -64, and -256 in SDH world.

The number of 40G metro and backbone DWDM (Dense Wave Division Multiplexing) linecards excluding Datacom optical network units shipped in 2010 are expected to be around 50,000 versus close to 400,000 10G linecards.

The relatively high price of 40Gb Ethernet has limited it to niche commercial applications to date, such as router interconnections, terrestrial backbones and short distance undersea links, but as prices fall, it's expected to become more competitive through 2010 with wider use in backbone links, especially for 10Gb multiplexing and in Metro Ethernet connections.

Global 40Gb and 100Gb will grow at a compound annual growth rate of 45% from around US\$250 million in 2008 to around US\$2.5 billion in 2014 with significant shipments of 100Gb/s linecards beginning from 2011.

In 2007, Verizon began experimental tests with live traffic of a 504 km Alcatel-Lucent 100Gb Ethernet connection between Tampa and Miami, Florida. Demonstrations were held by several companies in 2008. Trials were conducted and first products were introduced by several companies in 2009 and the IEEE 100GE standard is expected to be approved this June and early deployments include NYSE Euronext and network-wide deployment by Qwest.

From the 100G outlook and lessons learned from 10G/40G, interest in 100G is clear, but comparative port ASPs matter a lot. Flexibility is critical, For example, mixing waves in a shelf, in a span. Telco operationalizing can take years. Datacom is the volume market for 100GE and 40GE. Components can be critical path. Overall market health (or lack of) can drastically affect the pace of innovation and deployments.

Venture capital firms' telecommunications investment trend is worrying. More technology options aren't

necessarily better. Being first to market doesn't guarantee market leadership, instead volume does.

However, is 100Gb/s is not the end of the road or is 400Gbps and higher next?

Among new technologies we'll see is Optical Orthogonal Frequency Division Multiplexing (O OFDM), where data on one channel is broken up into hundreds or even thousands of subcarriers. Companies are actually developing this for 100 Gb/s but it's also an option for 400 Gbps.

An alternative is to use 256 QAM (Quadrature Amplitude Modulation) but this is challenged because because it can take five years or more for the required analog-digital converter to be available and these are not available for 40 or 100 Gb/s either.

So is traffic trends continue and fiber remains costly to deploy – and it will – there may be a real need for 400 to 1,000Gbps transmission by 2020.

While there are limitations on fiber carrying capacity but using multi-level coding schemes helps to push the boundaries.

### **The take aways**

In summing up the key messages at NetEvents, Camile Mendler said, "Telecommunication operators' revenues are on quicksand and their profitability will be pretty mediocre. There will be more used of managed services to reduce operational expenditure. European governments gouge operators for license fees, while Asia-Pacific governments don't and the industry must satisfy green credentials in procurement."

Vidya S. Nath, senior industry analyst with Digital Media said, "Users of the Apple iPhone are driving service providers to increase the capacity of the of their infrastructures."

With regards cloud computing, providers should look beyond applications to enabling business processes, providing storage and so on. For example, a post production house could lease the infrastructure for one-third the cost of their own system but it will require a high bandwidth connection.