

e-monitor

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FROM THE CHAIR

NEWS

NEW PRODUCTS

CALENDAR

August-September 2010

In this issue

- [ICT at the centre of political debate](#)
- [NBN ubiquitous, standardised and at 1Gb/s](#)
- [Innovators awarded](#)
- [New link to New Zealand and the US](#)
- [NBN rolls out in Victoria](#)
- [SMS from aircraft](#)
- [NBN facilities in universities](#)
- [Live demonstration data centre](#)
- [ASWEC goes to New Zealand](#)
- [Software engineering conference](#)

[New Products](#)

[Calendar](#)

ITEEC

2010
YEAR OF
ENGINEERING
LEADERSHIP

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from the chair

ICT at the centre of political debate

by Peter Hitchiner



It would be hard not to have noticed the attention that the National Broadband Network received in the election campaign. That the debate should be so focused on the technology and the bits and bytes rather than the services (noting there was some commentary on e-Health and e-Education) is perhaps missing the point.

Put simply, the national imperative is to be part of the digital revolution and understand the importance to the economy of being able to play in the digital world. It's about smart grids, smart water, smart infrastructure and so on. Apart from points of health and education delivery and for businesses, the need for high information rates rarely exists other than for entertainment purposes.

This is not to undervalue the importance of entertainment

(which can be educational in its own right), but the really significant economic benefits don't seem to require 100Mb/s to over 90% of the population, at least not until it's affordable and/or productivity benefits are clear.

Smart deliverables can be achieved generally at information rates readily available to most of the population today, so why the fixation on maximising the delivery of 100Mb/s? It is arbitrary because if the network is capable of delivering 100Mb/s (ie optical fibre end to end), it's just as likely to be able to deliver greater than 1Gb/s while requiring little additional cost.

The fact that other economies have a higher level of adoption of high information rate services does not necessarily translate to productivity benefits, although it may make life more liveable.

The outdoor culture of Australia is much more aligned with mobile devices and it is not surprising that an increasing portion of users are abandoning fixed lines to the home in favour of (lower information rate) wireless only. Wireless does require fair access to fibre in the backhaul networks, however users are content with wireless speeds and work is continuing in the area of compression technologies despite the almost limitless capabilities of fibre optic networks.

Perhaps there are better ways of applying the \$43 billion to deliver even greater economic benefits. Who will meet the costs of developing applications that use 100Mb/s or even 12Mb/s effectively? The digital economy requires products which meet needs in a cost effective and affordable way.

Engineers can make it so! There are simply insufficient ICT engineers in influential and leadership positions. Furthermore, we continue to be influenced by overseas equipment suppliers. The need for our indigenous industry to have a greater understanding of local needs is essential. We are steadily losing the capabilities to be leaders. Australia still has world-leading capability in fibre optics albeit this is diminishing since the work of the Australian Photonics CRC concluded.

In any case, we must take the opportunity to install fibre to the home in new developments and to progressively replace aging copper with fibre. Backhaul access and upgrade is what is required and whether 1Gb/s is delivered to the home, the backhaul (and international capacity) will remain the limiting parts of the network. Perhaps investing in capabilities in this regard is where some of the \$43 billion should be directed?

In my view, engineers should be providing leadership to ensure optimum delivery of ICT infrastructure and applications and avoid the trap of biggest is best.

This column also appears in the ITEE College Board Chair blog http://engineersaustralia.typepad.com/itee_college_chair/. Please post your feedback.

Peter Hitchiner is the ITEE College Chair 2010

[back to top](#)

news

NBN ubiquitous, standardised and at 1Gb/s

Speeds of 1Gb/s can be achieved over the National Broadband Network, according to NBN Co chief executive officer Mike Quigley.

Speaking at a presentation to the Australian Information Industry Association in early August, Quigley said: "We have an obligation as given by our shareholders to provide 100Mb/s to each premise, but we realised that with this technology there's no reason why we need to limit it to 100Mb/s. We can go to 1Gb/s on this fibre infrastructure, so there's no reason why we shouldn't make that available."

Under NBN Co's current proposal, 93% of Australian premises will be covered by fibre to the premises, an increase in 3 percentage points from NBN Co's previous target.

An additional 4% of premises will be served by a fixed wireless service and the remaining 3% of premises that are unable to receive a fibre or wireless connection will be serviced by a satellite connection.

NBN Co expects to launch two satellites, each with support for 200,000 users and guaranteed speeds of 12Mb/s. The choice to launch two satellites ensures that should a malfunction occur, the estimated 200,000 to 300,000 end-users will still have access to the network, even if at reduced capacity.

Quigley said it was important that a redundant system was available as it would take a long time to get a replacement satellite up into orbit.

Quigley also stressed the importance of having a ubiquitous and standardised network for retail service providers (RSPs) and for public applications such as e-Health and e-Education. He stated that these aspects of the network were as important as speed and throughput.

"We designed the network to provide an absolutely seamless integrated network for RSPs so they can serve it exactly the same way to end users not matter which technology they're on," he said. "It is very important to make sure to reduce barriers to entry".

Quigley acknowledged the argument that many Australians already have access to 12Mb/s connections over ADSL2+.

"You can do 12Mb/s at about 2.5km out from the exchange. I believe the average loop length in Australia is 2.8km so you'll have about 50% of people who can cover up to 12Mb/s on an ADSL2+ link."

However, he also pointed out that fibre is not distance dependent and that fibre loop length has no effect on speed.

"With fibre service you can do 1Gb/s for 15km," he said. "People at the end of the outer reaches will get the same as people in the middle."

[back to top](#)

Innovators awarded

The Australian Information Industry Association (AIIA) announced the top technology innovators for this year in Melbourne in early August.

The iAwards attracted a record number of entries this year. The awards were delivered across a wide range of 16 different categories such as e-Health, Industrial Application, and Communication, reflecting the relevance of ICT in different businesses and industries.

Winners for 2010 included iWebGate, which took out the Security Application Award for its "DMZ in a box" product.

It mirrors the trusted network and supplies services normally provided and located in the trusted network. Undesirables penetrating perimeter defenses remain stuck in a "ghost network" with nothing of value available and a lack of access to the trusted network or the ability to launch surrogate attacks on other networks.

Cool Door won the Tools and Infrastructure Award for its rack cooling system. Based on a refrigerated unit, the system is positioned at the front of a rack and enhances the cooling capacity of the facility to allow for, among other benefits, higher rack utilisation and lower power consumption.

Games development company Firemint also took out the Media and Entertainment Award for its 3D graphics game, Real Racing.

Companies awarded with merit or winning commendations in the 2010 iAwards will go on to represent Australia at the 2010 Asia Pacific ICT Alliance Awards, competing in Malaysia against the best technology solutions in the region.

AIIA has also developed a partnership with the Australian Computer Society to include recognition for professional achievements in addition to enterprise excellence.

For a full list of winners, visit the [AIIA website](#).

[back to top](#)

New link to New Zealand and the US

Asian telecommunications services provider Pacnet and newly formed fibre company Pacific Fibre Limited have announced plans to jointly build a city-to-city, low-latency subsea fibre optic cable to boost connectivity between Australia, New Zealand and the US.

The total project cost of the new cable is estimated at US\$400 million, and comprises at least two fibre pairs with 64 wavelengths per fibre pair. The cable is expected to have a capacity of up to 5.12Tb/s using 40Gb/s wavelength technology and will be further upgradeable to beyond 12Tb/s with future 100Gb/s per wavelength technology.

The 13,600km cable will connect Sydney, Auckland and Los Angeles, travelling over the most direct route between these landing points and delivering lower latency connections.

According to Pacnet, the new cable will support broadband networks currently under development in Australia and New Zealand and provide the necessary connectivity to international locations.

The new cable will be built on a partnership model that allows Pacnet and Pacific Fibre to each own and operate a fibre pair on the new cable system, but share responsibility for the cable supply contract as well as operations and maintenance costs.

This model has been used previously on the US\$300 million Unity cable connecting Japan and the US.
The new cable is expected to be ready for service in 2013.

[back to top](#)

NBN rolls out in Victoria

NBN Co has signed a contract with Telstra to construct a passive optical fibre network in Brunswick, Victoria.

Following the Tasmanian National Broadband Network (NBN) trial, Brunswick is the first of the five previously announced first-release sites for the initial NBN rollout. The other four first release sites are located at Townsville, Qld; Armidale, NSW; Minnamurra and Kiama Downs, NSW; and Willunga, SA.

These sites were selected to allow NBN Co to test the rollout in areas of different terrain, housing type and density, demographics, climate, existing infrastructure and other local factors.

NBN Co will be offering to install a free standard configuration fibre-to-the-premises connection to home and business owners within the Brunswick site. Those premises will then be NBN-ready when retail service providers (RSPs) start to use the network to offer high-speed broadband services. The construction of the passive optical network is the first of three phases of work outlined by NBN Co.

The second phase will see NBN Co deploy some of the active network equipment in the Fibre Access Nodes. This is the equipment that allows NBN Co to "light up" the fibre in readiness for service delivery.

Phase three will see the installation completed as NBN Co provides access to the network for RSPs and they in turn connect the end user to begin their trials.

A further 14 sites have been selected as part of the second release sites in Australia, with construction to start mid-next year.

[back to top](#)

SMS from aircraft

Australian airlines are another step closer to allowing the use of mobile phones in flight after the Australian Communications and Media Authority (ACMA) finalised radiocommunications licensing arrangements for mobile communication services on aircraft.

The ACMA worked closely with the Civil Aviation Safety Authority, which raised no technical objections to the new arrangements.

To allow for voice, SMS and GPRS services to be used, a small mobile base-station called a Picocell is installed on

aircraft during routine maintenance. It acts as a proxy, using the aircraft's satellite system to establish a connection between passengers' mobile phones and terrestrial networks. Direct connections from mobile phones to terrestrial networks are blocked to avoid interference.

ACMA's licensing arrangements allow airlines to deploy mobile communication services on their aircraft through special on-board systems so long as they are used in accordance with airline safety and operational procedures.

In establishing the licensing arrangements, the ACMA did not restrict the types of mobile communication services that could be offered on aircraft, including voice calls.

Despite this, several airlines have opted to offer only SMS and email services, possibly amid concerns for passenger discomfort or to maintain air travel as a "safe haven" from the connected world.

Overseas airlines have already begun using the technology to enable voice calls and broadband access to its passengers.

[back to top](#)

NBN facilities in universities

In response to an imminent shortage of skilled workers for the development of the National Broadband Network (NBN), technology vendors have partnered with Australian universities to offer courses, facilities and training centres.

In early July, Chinese manufacturer Huawei signed a memorandum of understanding with RMIT University to build a broadband training centre. The aim of the Next Generation Technology Training Centre is to provide technical training and develop a workforce capable of building and operating the NBN.

It will train 1000 students nationally, including 500 in Victoria, over the next three years.

At the University of New South Wales, Cisco has teamed up with the School of Electrical Engineering and Telecommunications and School of Computer Science and Engineering to develop a new postgraduate network systems architecture course.

The course will enable students to take a high-level view of networking systems. While students will learn about networking methods and technologies, it also teaches them how to use this knowledge to design, analyse and verify entire systems to meet business requirements and create scalable solutions.

At the University of Technology, Sydney, NBN equipment supplier Alcatel-Lucent will establish a facility for learning and professional development, focusing on the technologies used to form fundamental parts of a broadband-enabled Australia including voice over IP, video over IP, access IP technology, PON (Passive Optical Networks) technology and others.

The new facility will include a state-of-the-art laboratory and training rooms with equipment provided by Alcatel-Lucent.

Elements of undergraduate and postgraduate courses will be undertaken using the new facility in conjunction with Alcatel-

Lucent staff.

[back to top](#)

Live demonstration data centre

A new learning centre to help businesses optimise their IT infrastructure has been opened in North Ryde, Sydney.

The Emerson Network Power live data centre and demonstration facility has been equipped with the full range of Emerson's infrastructure including power protection, cooling, remote monitoring and system management technology.

The mid-range data centre covers an area of 125m² and provides businesses with an opportunity to run through scenarios such as running out of capacity, managing rack-space and scaling power and cooling requirements. The data centre runs live, with equipment upgraded and updated in regular development cycles, to provide businesses with a model for planning development in their own facilities.

One of the features of the facility is a cut-out switch to demonstrate what happens in the event of a total power outage.

The facility took 18 months to construct and has a cooling capacity of 30kW per rack. 60kVA UPS units operate in a dual-bus configuration providing eight hours of back-up power per bus.

To arrange a visit or for more information, contact [Russell Perry](#).



The data centre allows businesses to plan development in their own facilities.

[back to top](#)

ASWEC goes to New Zealand

By Ewan Tempero and Ian Warren

Established in 1986, the Australian Software Engineering Conference (ASWEC) is a leading technical forum for the exchange of peer reviewed research outcomes and industry best-practice in software engineering. ASWEC 2010 was hosted in Auckland, New Zealand, on 6-9 April, 2010.

A highlight of the ASWEC 2010 program was the keynote speakers Phillipe Kruchten, K. Rustan M. Leino and Gareth Cronin.

Kruchten has been at the forefront of developing quality software with his work directing the development of the Rational Unified Process. His keynote presentation addressed the question of what characteristics a software development project should have if using an Agile development

methodology is to be successful.

Leino discussed his work at Microsoft Research on experimental notations for contracts in .NET and other code for improving software quality by reducing the chance for errors.

Cronin discussed the many fascinating issues that occur in the production of corrugated packaging – cardboard boxes – and how software systems have been developed over 30 years to manage these issues.

The conference received 66 research submissions and 17 industry submissions from 18 countries. In addition to keynote presentations, 24 research and 13 industry papers were selected for presentation at the conference.

In addition, there were two tutorials, a workshop on software engineering education, and a panel on the conference theme involving members from New Zealand industry. These presentations, plus the other delegates who attended, made for a lively and stimulating conference.

ASWEC will take a break during 2011 due to the Asia-Pacific Software Engineering conference being held in Sydney in December 2010. There is already a strong bid being put together for the following year in Australia, and so we look forward to seeing everyone in 2012!

[back to top](#)

Software engineering conference

The 17th Asia-Pacific Software Engineering Conference (APSEC) will be held in Sydney from 30 November to 3 December.

Established in 1994, APSEC is an international conference in software engineering and technology for the Asia-Pacific region.

This year the theme is "software for improving quality of life".

APSEC 2010 will feature papers for research and industry, workshops, tutorials and a doctoral symposium. A conference dinner will be held on 2 December.

Keynote speakers include NICTA chief executive officer Dr David Skellern, IBM Rational chief technical officer and vice-president Martin Nally, and Microsoft External Research director computer science Judith Bishop.

[back to top](#)

new products

Getting more from desktop computers

Linux Desktop Virtualisation company Useful Corporation has developed a multiseat Linux computing software that turns 1 computer into 10.

Useful Multiplier increases access to computing in classrooms, computer labs, and libraries by enabling multiple people to connect to a single host PC, each with their own monitor,

keyboard, and mouse.

Each user individually controls his or her own station and applications. To the users, it seems like they each have their own dedicated PC, but in they are actually sharing the resources of a single computer.

Setup is plug and play, and configuration is automated. Users plug in USB multiseat devices into the host PC, plug a monitor, keyboard, and mouse into each USB video device, install the software, and the system is ready to support multiple users at the same time.

A preview of Useful Linux MultiSeat 2010 is available for pilots and customer trials as an Edubuntu 10.04 integrated install DVD. To download a copy, visit Useful's website.

www.userful.com



The software allows multiple people to use the hardware of a single machine.

Blades for military, transport and communications

ADLINK Technology has released its cPCI-6510 Series of 6U CompactPCI blades featuring a 32nm Intel Core i7 processor with 2.53GHz clock speed and up to 3.2GHz maximum turbo frequency.

The cPCI-6510 supports up to 8GB DDR3-1066 ECC soldered memory. With all components soldered onboard, it is ideal for the military, transportation, and communications applications.

The cPCI-6510 provides two 64-bit/133MHz PMC sites and an optional PCI Express x8 XMC site.

A 2.5" Serial ATA hard drive or flash disk can be equipped on the cPCI-6510V version. One CompactFlash socket is also available onboard. RAID functionality can also be supported via optional rear transition modules.

www.adlinktech.com

The 6U CompactPCI blades are ideal for



transportation and communications applications.

Hard drives get smaller

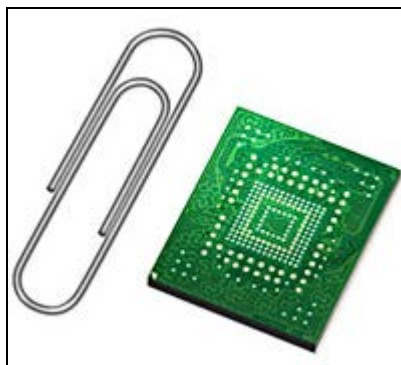
Flash memory card manufacturer SanDisk Corporation has developed a new solid state drive (SSD) that is smaller than a postage stamp and offer higher capacities and performance than its existing storage solutions.

The SanDisk integrated SSD (iSSD) is a flash SSD device supporting the industry standard SATA interface in a small BGA (Ball Grid Array) package and can be soldered onto any motherboard.

It has been designed for use in mobile computing platforms such as tablet PCs and ultra-thin notebooks and to deliver the durability needed by portable devices that are frequently dropped or jostled.

It offers 160MB/s sequential read and 100MB/s sequential write speeds and has no moving parts. The SanDisk iSSD measures 16mm x 20mm x 1.85mm and weighs less than one gram. The drive is available in capacities ranging from 4GB to 64GB.

www.sandisk.com



The new drive is smaller than a postage stamp and lighter than a paper clip.

[back to top](#)

calendar

Engineering Education Australia

Slide rule thinking in the internet age (half day) Hobart 13 Sep
Engineering planning and design (1 day) Melbourne 9 Sep,
Adelaide 20 Oct, Perth 11 Nov
Fear free presentations (1 day) Brisbane 25 Nov.

For further information on these and other events organised by Engineering Education Australia go to www.eeaust.com.au.

Engineers Australia conferences

The 17th Asia Pacific software engineering conference will be held in Sydney 30 Nov to 3 Dec. Inquiries: www.apsec2010.com.

The 19th Australian Institute of Physics Congress incorporating the **35th Australian Conference on Optical Fibre Technology (AIP/ACOFT 2010)** will be held in Melbourne on 5-9 December. Inquiries: www.aip2010.org.au.

The 15th International conference for women engineers and scientists will be hosted by Engineers Australia's National Committee for Women in Engineering and the International Network for Women Engineers and Scientists in Adelaide 19-22 Jul 2011. Inquiries: www.icwes15.org. The deadline for submission of abstracts is 1 December 2010.

For a more comprehensive list of Engineers Australia's conferences, visit www.engineersaustralia.org.au/conferences.

Other events

The Electromagnetic Compatibility Society of Australia in conjunction with the IEEE EMC Society Victorian Chapter will hold its **9th Annual Symposium on EMC** in Melbourne on 8-10 Sep. Full details are on www.emcsa.org.au.

The 2011 World Engineers' Convention will be held on 4-9 Sep 2011 in Geneva, Switzerland. Titled "**Engineers power the world - Facing the global energy challenge**", the convention seeks to encourage innovative engineering aimed at solving the problem of globally sustainable use of energy. For more information go to www.wec2011.org or contact info@wec2011.org.

[back to top](#)