Don’t get hung up on the plumbing!

Public Symposium

Converging on an NBN Future

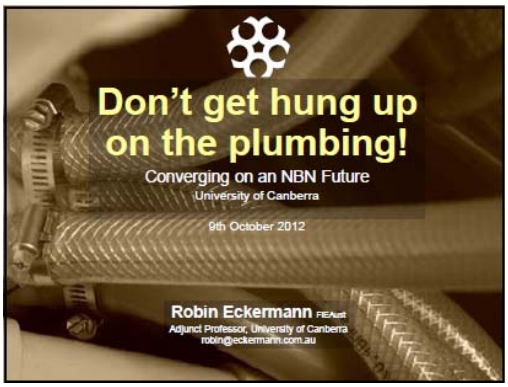
Content, Connectivity and Control

University of Canberra – 9th October 2012

Abstract:

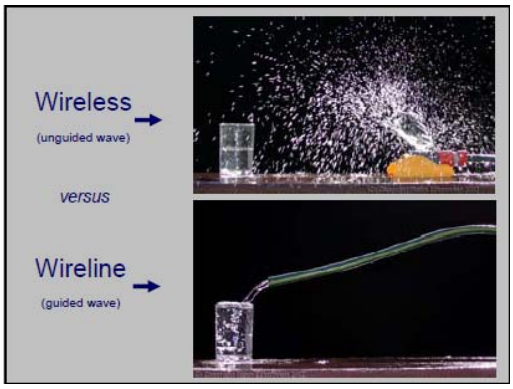
Fibre all the way to the end-user represents the ultimate in "future proofing" last-mile bandwidth, and the NBN is eagerly anticipated in many areas of the community. However, network infrastructure is little more than "plumbing" to eliminate speed limits that most Australians won't challenge any time soon! Transforming the way we live, work and play depends much more on digital literacy, the availability of relevant and affordable services and the ability to embrace new approaches. Holding back on the challenges that these pose until the NBN arrives is a recipe for slipping behind rather than getting ahead.

Presentation:



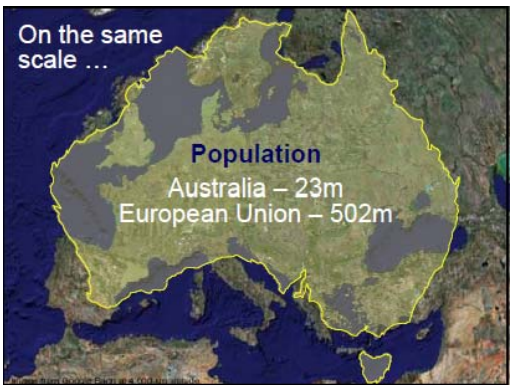
The digital economy is playing an ever increasing role in our future – and connectivity is one of its key foundations. The NBN promises a significant boost in the broadband connectivity available to Australians – but at the end of the day, it is just a means to an end. Focusing too much on the network infrastructure (that is, the “plumbing”) increases the risk of being distracted from other issues that are at least as important in determining what we make of the e-world of the future.

Let me start by confessing that I’m a plumbing man! I spent what was one of the most exciting chapters of my career thus far leading the establishment of TransACT in Canberra. Many view this as a fore-runner of the NBN a decade before the NBN was conceived. It delivered 52 Mbps to every home under an open access model, and was one of the first networks in the world to deliver high quality video services over broadband. As Chief Architect, network plumbing was a key focus of my role!



Let me also add that I support the NBN vision. Fibre gives the ultimate in communications capacity, and suggestions that it will be rendered obsolete by wireless technology any time soon are fanciful. There is simply no comparison between spraying a signal through shared airwaves to a large community of users and delivering it with surgical accuracy over a high capacity pipe. So there are few initiatives that could better future-proof Australia’s fixed line network infrastructure than taking fibre to the premises for 93% of users.

For the remaining 7%, the vast scale of Australia's geography – here overlaid on Europe – makes taking a fibre-grade cabled service to every last user impractical, at least in the foreseeable future. Wireless and satellite have a role to play in filling the gap, and under the NBN, most Australians can look forward to an improvement in connectivity whether served by fibre, wireless or satellite technology.



So why do I caution against getting hung up on the plumbing? Let me give you three reasons.

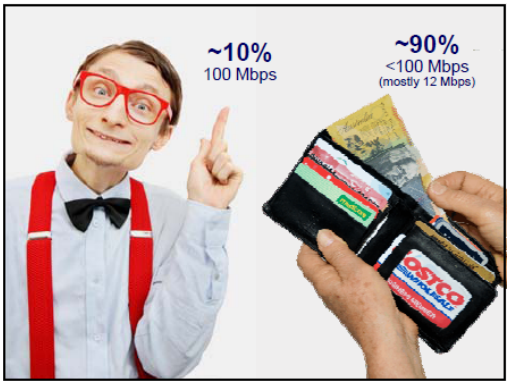
Firstly, there's an artificial and inappropriate focus on the speeds that fibre can deliver. The figure of 100 Mbps is regularly bandied around, but this figure is largely irrelevant:

- it is not the upper limit of fibre's capacity;
- most users will subscribe to lower speeds; and
- many of those who subscribe to 100 Mbps will rarely if ever see services operating at full speed due to other bottlenecks in their end-to-end connections.

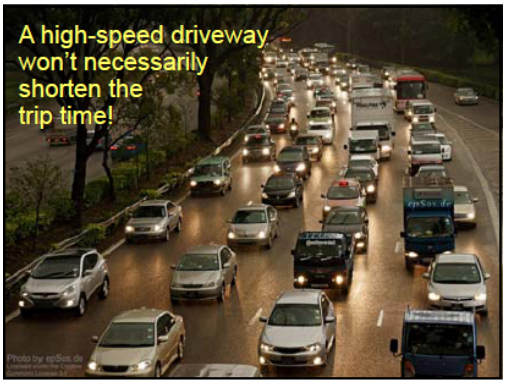
To explain each of these a little more fully:

1. The capacity of fibre is almost beyond the limits of imagination – speeds in the tens of Terabits-per-second have already been demonstrated. To put this in perspective, this heap of 120 DVDs (each with 4.7 Gigabytes of content) could be transmitted over a 10 Tbps link in a little over half a second. Of course, such speeds involve very expensive equipment at each end of the fibre – but even with the commodity equipment that NBN is using, speeds of a Gigabit-per-second are possible, and the limits can be expected to lift further as and when there is a large enough market for higher bandwidth.

2. TransACT's experience highlights the fact that only about 10% of users – geeks if you like – will enthusiastically embrace the *maximum speeds* available. A much larger proportion of users are driven by their hip pocket nerve and will choose the *lowest cost* option that meets their essential requirements. Accordingly the most popular connection speed is likely to be 12 Mbps downstream and 1 Mbps upstream. For many Australians living in metro areas, connections of about this speed are *already available* today using ADSL2+ or the best of cable modem technology.

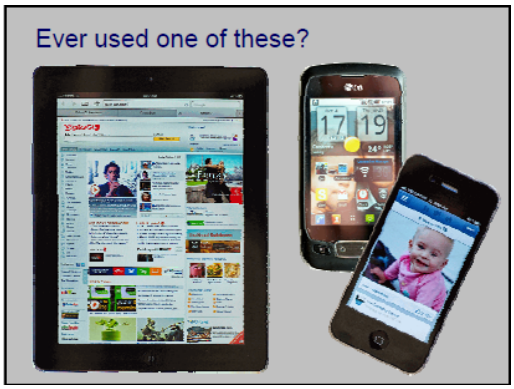


3. Fibre to the premises has the capacity to abolish speed limits in the "last mile", but the last mile is only one link in the typical communications path involved in most services. It is like having an eight-lane local street that gets you in quick time onto shared arterial roads where speeds remain limited due to congestion. Of course, the last mile is the most expensive link in the chain to upgrade – so an investment in improved last-mile capacity positions Australia well for the future. However, upgrades to national networks, to international links and ultimately to the world's network infrastructure is needed to consistently improve end-user experiences.



So I hope that I've shown that an excessive focus on the local access speed that becomes possible with fibre-to-the-premises is ill-placed!

The ***second*** reason not to get hung up about NBN plumbing is that the *fixed-line* connectivity which is being improved through the NBN initiative is *only one of the pillars* of the digital economy. The explosion in popularity of smart phones and tablets is being driven by the desire to access *any information, any where* and at *any time* – and much of this depends on connectivity provided through the mobile phone networks.



As I argued earlier, wireless capacity designed to achieve wide-area coverage will not rival what's possible on a cabled networks any time soon. However, countless innovative new applications are being developed to work effectively using the performance that *is available today* over mobile phone networks.

At the very bottom end of the performance scale, consider the value of a short SMS message telling me that one of the shareholdings in my portfolio has reached a threshold at which I'm willing to sell. Getting this message on my mobile phone whilst on the road allows me to initiate a sell order (also via my phone) and capitalise on the opportunity. Discovering the same information when I arrive home at the end of the day and finding that the opportunity to sell has been and gone is no substitute!

Thousands of new applications are emerging to unlock the value of the digital economy from mobile devices: for example, alerting farmers that an electric fence has failed and their stock may be vulnerable to wild dog attacks; providing spot prices for agricultural produce; using the device's inbuilt camera to solicit help with a problem – and the list goes on.

As a result, an increasing number of Australians are re-engineering their digital lifestyles to take advantage of mobile connectivity. For some, this offers a complete alternative to fixed-line connectivity, despite the huge performance difference. For most, it is an increasingly essential counterpart.

The digital economy rests on two connectivity pillars therefore – fixed line and mobile access. The Government's NBN initiative addresses some market failures in Australia's fixed line connectivity – ultimately ensuring that local access is not a limiting factor in the ongoing evolution of the digital economy.

In contrast, improving mobile connectivity remains a matter for commercial investment decisions by the mobile operators, and there are significant geographic areas (predominantly in regional Australia) where the market will not deliver what's required. These areas do not have the population density (and hence revenue potential) to justify any one of the mobile carriers investing in network coverage. I expect one of the later speakers, Rosemary Sinclair, may touch on this later today – areas not well served with mobile coverage will remain limited in their ability to exploit the digital economy to maximum.

The ***third*** reason not to get hung up about NBN plumbing is that the availability of higher bandwidth does not change anything in itself. I recently went from a connection giving me 8 Mbps downstream and 400 kbps upstream to a connection giving me 40 Mbps downstream and 4.5 Mbps upstream – that's 5-10 times faster and a higher speed connection than most Australians will opt even when the NBN becomes available to them. Was my life magically transformed? I'm afraid not – I did exactly the same things I've always done. It's true that the speed of response on *some* (but certainly not all) applications was a little faster, but within a matter of days, this was no longer noticeable and it was business as usual.

Bandwidth is only one of the ingredients needed for the digital transformation of our ways of living and working! There are far bigger challenges associated with changing to new ways of doing things.

Let me give an example! Armed with my improved capacity, I set about equipping myself with the ability to support high-definition video conferences from my home office. It sounds simple enough – and its one of the "showcase" applications that is often cited as a reason for the speeds that go beyond what most established infrastructure can deliver.

Anyway, over the next three months I battled with bugs in immature consumer-grade software and complex routing issues associated with the legacy protocols like H323 that many existing corporate systems use today. However, persistence paid, and eventually I triumphed with successful test sessions to AARNet and several other destinations. Sadly, the original reason for implementing a high-definition video conferencing capability had long-since passed by then – and today the system has fallen into disuse. The vast majority of individuals and businesses with which I could potentially interact are simply not geared up for it – they don't have the equipment, protocols are still far from plug-and-play, business procedures don't contemplate this form of connection, there are no video-conferencing equivalents of the phone directory and so on and so on.

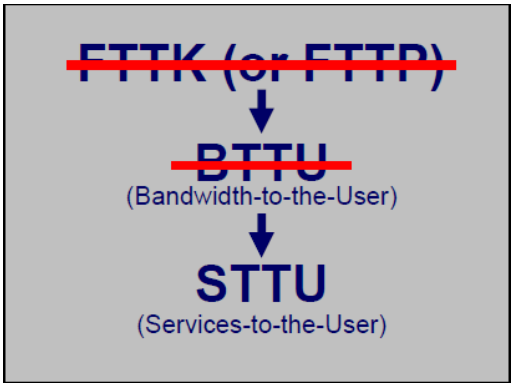
The lesson in all this is that the better network plumbing being provided by the NBN is welcome, but in itself it won't unlock the future. Far bigger challenges lie in transforming the way we live and work to exploit the digital economy to the full – and much of the needed progress can be made with the infrastructure that's already in place.

Last year I had the privilege of serving on the independent review committee that reports periodically to parliament on the state of regional telecommunications. One of the most disturbing observations for me was to hear some folk suggest that they needed a strategy to prepare for the digital economy because sooner or later the NBN was destined to roll into their community.

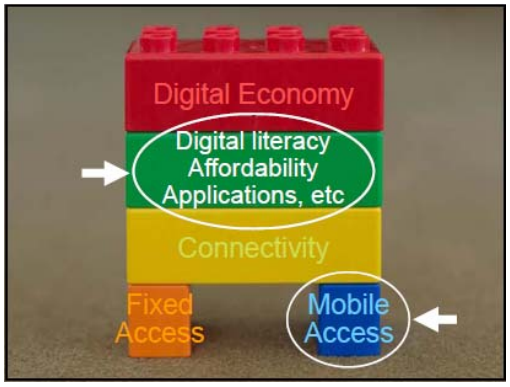
It's enough to make you tear your hair out in frustration! The digital economy has been evolving for at least 15 years – and anyone who hasn't yet discovered it has already missed the boat! It's a global phenomenon, and it will continue to develop with or without the NBN in Australia. Certainly the NBN will help to ensure that last mile infrastructure is not the bottleneck to certain forms of progress, but it won't dissolve the many other impediments and challenges that Australians face.

It's applications that dictate the sort of speeds are needed in the last mile, and most of these evolve at a pace and in ways designed to utilise the *typical* network speeds available around the world. Assuming the NBN runs the gauntlet of at least the next three terms of government and is built as planned, most Australians will have faster connections available to them than users in many other countries. This may lead to some unique, locally-developed Australian applications – but international developers are unlikely to rush into building applications that demand fibre speeds but for which there is only a limited global market.

During the creation of TransACT some 15 years ago – long before the advent of fibre access networks – I was quietly proud to be involved with one of the world's first and fastest fibre-to-the-kerb (FTTK) networks. As my thinking matured, it became clear that the technology really didn't matter – so long as it delivered adequate bandwidth. For a brief time I flirted with the acronym bandwidth-to-the-user (BTTU). I now think that the most appropriate focus is on services-to-the-user (STTU). Some applications will demand high speed connectivity – many will not. Some will work with connectivity tethered to particular locations – many will require the anytime anywhere connectivity of mobile networks.



By way of summary, to get the best outcome from a digital future it will be helpful if we moderate the hype about NBN plumbing and sharpen our focus onto the softer challenges that accompany large-scale change in both personal and institutional practices. We need to raise the level of digital literacy – we need to ensure that access is affordable even to the most disadvantaged without our community – we need to build new applications and systems – we need to improve mobile coverage – and so on.



It is fair to say that encouraging progress is being made on some fronts – for example, with efforts to transition to patient-controlled electronic health records. These initiatives highlight just how much time and effort needs to be invested in changing systems and practices that have served sectors of the economy well over many decades.

Let me also acknowledge that the Government does have some programs to promote usage, literacy and digital economy innovation. However these are tiny by comparison with the investment in NBN plumbing – and I believe Australia could benefit from some re-balancing of its investment priorities.

Thank you for your interest and attention!

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