

Submission to the expert panel on the National Broadband Network

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Executive Summary:

*“It ain't what you don't know that gets you into trouble.
It's what you know for sure that just ain't so.”
- Mark Twain*

In the debate, and the considerations, around how to build the next generation of broadband access network in Australia, one key belief - indeed it is fair to call it a myth - exists. It is a myth that *just ain't so*.

This myth has tremendously deep consequences for the network that is being contemplated. Correcting this myth leads to enormously improved outcomes for the network, for consumer benefit, and indeed is so important that it is a likely critical success factor for the whole enterprise.

Here is the myth, in its simplest form:

“To build a new FTTN network, it is technically and economically necessary to physically unplug (and strand the investment in) all of the existing competitive ADSL2+ services provided from exchanges today. In effect, to build the new, we must destroy the old. We must accept that destruction in the name of progress”

This just ain't so!

So what is the truth? Again, in its simplest form, it is this:

“It is entirely possible (and, for pro-competitive outcomes, it is *necessary*) to *indefinitely preserve* the existing facilities based investment framework (ULL & LSS based services including ADSL2+), in parallel to building and operating a future FTTN based National Broadband Network”

Simply accepting the myth will lead to a raft of unfortunate consequences that are detrimental to consumers - and which may well be so serious as to derail the entire NBN

process due to legal, regulatory, and access battles that will otherwise ensue, regardless of the winner of any tender process to build it.

In the rest of this submission, we will:

- Prove this contention (that parallel operation of the old and new *is* possible),
- Explain the consumer benefits of doing so - and show how this is in fact a critical success factor, and
- Address some counter-arguments to accepting this position, and explain how to overcome each of them

If we accept the myth, what bad things happen?

Before we meet this myth head-on, we will start by examining the consequences of the status quo - of letting this myth colour our forward plans.

If we start from this mistaken belief that we must completely disconnect all of the copper wires leading back to the exchange, from every area in which we deploy a new Node (that we must do a full Node 'cut-over' when building FTTN), what are the consequences?

They are:

- 'Stranded Investments' : Massive investment made for many years to date - and continuing today - in the existing facilities based access regime will be *destroyed*.
- Regardless of who wins the tender, other impacted parties will take legal action to address their lost investments and/or their lost future earnings. These actions will substantially delay the building of the new network.
- Consumers lose access to existing ADSL2+ services, and critically to *existing ADSL2+ service price points*. The risk exists that the new services that replace ADSL2+ may offer worse price/performance - and hence actually drive consumer benefit *backward*.
- In losing those existing services, we also lose all of the competitive tension created by their presence. No amount of adjustment of the regulatory framework can adequately insulate against prices rising above their current level in a monopoly situation such as this. Only the continued presence of competitive services in the market can provide sustainable protection against monopoly rent being ultimately extracted from consumers.

Preserving an existing technology for an extended period in the market when a new technology appears is a normal and productive process.

The central myth discussed in this submission may be used as an excuse by some parties to justify throwing out the existing services in the name of moving forward in this

case. They may justify the most extensive re-monopolisation of telecommunications services in Australian history on the basis that it is just ‘technically unavoidable’.

However:

***This re-monopolisation is in fact completely unnecessary.
We can have our cake and eat it too.
And consumers will benefit in vital ways if we do so.***

So : How can we preserve the existing (ADSL2+) and the new (FTTN)?

It is clear from existing work being undertaken by the Communications Alliance (CA) - formerly ACIF - in the area of VDSL2 standardisation, that the most logical mechanism to ‘drive’ the shorter copper loops of an FTTN network is the ‘VDSL2’ DSL standard.

VDSL2 is essentially the next incremental evolution after ADSL2+; It offers still higher peak speeds than ADSL2+, by operating across a far wider range of frequencies ‘on the wire’. It offers the potential of maximum copper-line based speeds in the order of 50-100 megabits per second (compared to the theoretical maximum for ADSL2+ of 32 megabits per second, and the practical maximum of around 24 megabits per second in most cases).

It has been argued by various parties that to install VDSL2 equipment in a ‘Node’ cabinet (mid way along the existing run of copper cables from an exchange to customer premises), makes it necessary to completely cut the copper cable runs back to the exchange, with the ‘unfortunate’ consequence of disconnecting the existing ADSL2+ deployments in those exchanges.

This is, of course, the central myth we seek to ‘bust’.

Let us start with that most critical contention:

The claim that deploying Node based VDSL2 without removing exchange based ADSL2+ is technically necessary:

This is simply not true.

This belief has become popular over the last few years. However, in the intervening period, more research (see References at the end of this submission) proves that this is a red herring. It proves that smooth coexistence is entirely achievable.

Operating VDSL2 equipment mid way along copper cable runs from an exchange (called ‘mid-span injection’) creates interference, if it is done indiscriminately (at full transmit power over the full spectral mask available).

This interference, in principle, leads to lower speeds for both the 'existing' (ADSL2+ exchange) services and also for the 'new' (Node based VDSL2) services.

However, VDSL2 deployment performance far in excess of the NBN target performance does *not* at all depend on operating at full transmit power over the entire spectral mask concerned.

The technical modeling and development of appropriate deployment modes to allow concurrent deployment alongside existing uses of the copper line PSTN network is one of the main reasons that the Communications Alliance (or "CA" - formerly ACIF) exists;

Working groups in the CA have developed the deployment rules for the use of ADSL2+ services in the copper line network (and in the market), without significant detriment to other existing copper line services.

And at present, the Communications Alliance (CA) has a current working group designing the new, legally enforceable network deployment rules for VDSL2 in Australia.

These rules will define how a future VDSL2 Node deployment would need to be configured (in terms of transmit power distribution and spectral masks) in order to exist cooperatively with an existing exchange-based ADSL2+ deployment.

Papers submitted to the VDSL2 working group by NEC (a member of the working group) and supported by other working group members including Internode, prove that mid-span injection of VDSL2 can be done in a manner which has practically zero impact in terms of interference (and hence performance), while operating at the same time as existing exchange-based ADSL2+ services.

This is the critical point of this entire submission:

Exchange based ADSL2+ services can coexisting with Node based VDSL2 services, with practically no performance impact to either service type

The NEC submission is listed in the References section of this submission and a copy has been attached to this submission for reference.

In addition, this work by the Communications Alliance (CA) has international precedent; Work done in 2005 by the UK by British Telecom and Ofcom (the UK regulator) provide support for this hybrid operational mode - and indeed the NEC proposals for CA have been significantly based on the existing UK work.

A copy of the Ofcom paper describing this work and including relevant diagrams and PSD masks is also listed in the References section of this submission. Again a copy of the document is also attached for reference.

Finally, Internode has recently taken delivery of VDSL2 DSLAM equipment from our primary DSL equipment vendor (Ericsson) and has commenced the lab testing of that equipment. Our aim is to use the equipment, via various appropriate tests, to demonstrate this coexistence to our own satisfaction.

Other counter arguments (and their solutions):

There are some other arguments asserted that argue against preserving the existing ADSL2+ competitive framework, despite the 'mid-span injection problem (as above) having now been shown to be avoidable.

We will address some of these below and provide the reasons why they are not a barrier in practice:

1) The contention that Overbuild Protection is necessary

It has been argued that it is necessary to have 'overbuild protection' for the new network to ensure that there is an economically viable business case. Clearly, the risks inherent in any changes needed to the law (and the potential loopholes if a carrier decides to overbuild 'anyway') are enormous.

We submit that if a network requires such overbuild protection to survive, its existence is in a strong sense an 'un-natural' one - and it is vulnerable to any other party finding (and exploiting) any legal loophole in any legislation that may be enacted to provide that protection.

Instead, via the preservation of existing investments - and the continued support of new ULL and LSS based investments - we have a scenario in which overbuild is actually *designed in* to the process - and hence in which the entire issue of overbuild is essentially defused.

2) The contention that full Node 'cutovers' are economically required in an FTTN network to avoid the labour costs of visiting the Node to connect each customer later

The contention has been made that all copper lines in a Node cabinet must be cut over to the equipment in the Node cabinet at once (stranding the existing access regime and removing consumer choice permanently) because this offers a lower labour cost than patching customers in to the new network one-at-a-time.

All advances in broadband services have transition costs. Today, ADSL2+ competitors pay per-connection/per-cutover fees to migrate customers to their ADSL2+ DSLAM ports. They simply factor these costs into their retail models and pay those costs.

And so, service installation or churn (migration) fees are charged today, and those fees are sufficient to fund the 'truck roll' (technician visit) to patch a customer from one set of infrastructure through to another, either in an existing exchanges or a street cabinet.

The market already contains many retail offers featuring "\$0 setup" costs - where those costs are recovered over the course of a contract. Hence the wholesale installation cost is not a practical retail barrier to the new network, as it has not been for the existing ADSL2+ services.

Continuing to have those visits made (to Node cabinets, instead of exchanges) in the future represents a trivial cost compared to the cost of losing the existing access regime in the process of creating the new one.

Indeed, the labour cost to do an entire Node cutover would have to be funded 'up front' and would arguably act against the viability of an FTTN investment model.

Why would an FTTN operator want to incur that additional up-front investment when their future customers will pay for the labour costs concerned incrementally - on demand - in the future?

3) The claim that the hybrid model does not support older ADSL services, only ADSL2+, so that customers with older modems would not be able to be serviced

This is debatable - but assuming for the sake of argument that it is true - this is really not a significant issue.

Practically 100% of all ADSL devices sold in Australia since circa 2005 have supported ADSL2+ (whether customers are using them for ADSL2+ connections or not).

By the time a new network is fully deployed (which existing estimates suggest will take 3-5 years from today at the minimum), any customer devices left in the network that do not support ADSL2+ will be at least six years old - or about twice the usual technology life cycle for such devices.

If ISPs (to preserve their existing ADSL2+ deployment investments) need to provide great deals to their customers to upgrade to an ADSL2+ customer-end device (whose costs are trivial at this point), they will simply do so.

It is, therefore, easy to address the (by then) minority of such customers who don't already have those devices, by offering them a good deal on an upgrade (or by providing hardware 'free' in exchange for a renewed contract term commitment).

4) Transposition back to exchange copper will need to be supported

To allow customers the option to move to a competitive ADSL2+ provider if they do not find an FTTN based offering to be sufficiently attractive for their needs, an order placed to connect an exchange-based ADSL2+ service to an exchange point of interconnect will need to rely on a process called 'Transposition'.

'Transposition' in this context refers to the notion of patching a customers' connection at the Node cabinet back to a pair of copper wires that leads back to the central exchange concerned.

Fortunately, this process is an existing, established one - Telstra attempt such a transposition process routinely, and at no extra cost, when a wholesale customer submits a connection request for ADSL services today.

Hence, it is reasonable to expect that regulatory changes inherent in bringing in the FTTN network would include the requirement that the FTTN operator implements that transposition service (automatically and within the existing connection fee) to access seekers who order an exchange-connected ULLS or LSS service.

This means that future customer connections on to an exchange-based ADSL2+ service may continue to be made in areas in which an FTTN Node has been deployed.

Likewise, a customer ordering an FTTN based service and whose line is currently attached to an exchange-based copper line would have the same Transposition applied automatically (in the other direction) to re-patch their copper line to active equipment located in the Node cabinet.

What are the benefits of preserving the existing competitive ADSL2+ market?

The benefits of preserving the existing competitive access market - using ULL and LSS Declarations to deploy ADSL2+ and related services - are enormous.

They are:-

- * Avoiding a deep policy conflict between the NBN (if it does mandate or permit destroying ADSL2+ services) and long term federal government and regulatory policy since 1991 (to support the continued existence and development of such services in the network).
- * The preservation of competitive tension at the retail level (including, critically, price)

All the changes to the law, and all the ACCC probity in the world, won't ultimately stop a monopoly 'gaming' the system and extracting monopoly rents - as the last decade has shown very clearly, in areas where such rents are still being charged.

What *does* avoid the retail price of new FTTN based services spiraling upward, however, is the presence of a competitive alternative. That competitive alternative is provided via the existing ADSL2+ facilities based competitive market.

If we preserve that existing market, with its existing price points, we you guarantee (in a manner that is both necessary, and sufficient) that any new network will not be able to embed any unreasonable 'monopoly rent' in its pricing structure.

Finally, in preserving the existing services, we ensure that consumers avoid having an existing service forcibly removed from them 'in the name of progress'.

It is hard to argue to consumers that the new network is pro-competitive when it is allowed to be used as an excuse to un-necessarily destroy the existing ADSL2+ services they can purchase today.

* The avoidance of massive legal battles

In essence, whoever winds a tender to build an FTTN network (if it is allowed to destroy the existing access framework) will become the subject of concerted legal action (along with the government and the regulator) from those who aren't getting to build it and/or from other ISPs/Carriers whose services are about to be forcibly disconnected.

Having spent a decade investing with the encouragement of successive federal governments and the regulator, it beggars belief that those investors will simply and happily have that investment destroyed without acting to seek compensation for its loss.

However, if one does not disconnect the 'existing' while building the 'new', this entire issue simply disappears - existing investments are not destroyed, and the transition to an FTTN based future network can occur over an extended period (10-20 years or more), as is entirely appropriate for a change of this magnitude.

* The preservation of innovation

If the FTTN process and the entity controlling the network doesn't support the operation of a new and innovative access mode on the copper network, the potential remains for a competitor using its own infrastructure in exchanges to offer that innovation instead.

Preserving existing exchange-based access allows the 'gene pool' for innovation to be larger than just the ideas advanced by (or supported by) the FTTN operator. Clearly this increased potential for innovation in services to be provided in multiple ways is a pro-consumer outcome.

* The avoidance of most (possibly all) substantial changes to the law

If we preserve the existing access regime, we obviate most (if not all) of the need for likely heavy-handed, deeply intrusive, and potentially flawed, changes to the laws that govern telecommunications competition in Australia.

It seems to be a huge - and avoidable - risk, to contemplate the otherwise needed, and fundamental, structural change to the telecommunications access law, in a short time-frame.

Turning off facilities based competition via such legal changes is an exceptionally risky exercise.

Why do so at all?

Conclusion:

It is in the interests of consumers, of competition, and ultimately of the FTTN network, for the new network to be deployed along with mandated continuation of existing service types, for those consumers who wish to use those existing services in the future.

This 'hybrid' operation - preserving the existing ADSL2+ based competitive broadband market while also supporting the full performance deployment of a new VDSL2 based Node network - is entirely possible.

This operational mode is also the only sustainable way to guarantee pro-consumer prices at the retail level, and pro-consumer innovation at the technical level.

It allows the new network to bring those consumers who need it 'into the future', while allowing existing services (and their existing price/value points) to exist as a permanent competitive 'backstop' that will keep any future FTTN operators honest.

Changing the laws simply can not stop a monopoly acting as a monopoly. To avoid that activity in the future, one must simply avoid throwing out the baby with the bath water - one must *preserve competition* instead.

This is not a minor issue - it is a critical success factor for the network (and for sustainable pro-consumer outcomes from building it).

Hence, and in conclusion, we submit that there is one critical item that must be added to the terms of reference for any successful new broadband network.

It is this:

* Existing facilities based competition and exchange-based access to the Declared ULL and LSS service types must be preserved in parallel to the deployment of any new FTTN based VDSL2 network. This is necessary to ensure pro-competitive pricing and pro-competitive technical innovations are guaranteed into the future.

References:

- iiNet/Internode combined 'heat map' showing real world ADSL2+ performance in the Sydney basin in 2008

<http://www.internode.on.net/news/2008/02/76.php>

- Blog discussing the pro-consumer benefits of considering accessibility and price, not just speed, in the advancement of broadband services

http://web.mac.com/simon_hackett/Site/Technology/Entries/2007/6/5_The_real_issues_about_high_speed_broadband.html

- NEC Australia Submission to Communications Alliance VDSL2 Project Working Committee - Proposed Addition of Shaped-PSD VDSL2 Deployment Classes for Multiple-Feed Distribution Areas in State A – Rev. 1. Authors: Richard McCarthy, Stan Davies & Ashley Halford – 30th October 2007. *This is an NEC submission to Communications Alliance VDSL2 working group, demonstrating that exchange-based ADSL2+ can coexist with Node based VDSL2 without significant performance penalty to either deployment.*

(attached)

- ND1602:2005/08 : Specification of the Access Network Frequency Plan applicable to transmission systems connected to the BT Access Network. Author: Network Interoperability Consultative Committee, Ofcom, UK. *This document provides precedent to the NEC work in the Australian VDSL2 working group, by demonstrating the same hybrid approach is designed into the UK competitive access regime.*

(attached)