

Alcatel response to
Department of Communications, Information Technology and
the Arts
Broadband Connect and Clever Networks

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Alcatel Australasia
Head Office:
280 Botany Road, Alexandria, NSW 2015

For further Information Contact:

Carolyn Betts, Marketing Communications Director
carolyn.betts@alcatel.com.au or 0418 487 469

Stefan Keller-Tuberg, Principal Engineer – Chief Technology Office
stefan.keller-tuberg@alcatel.com.au or 0409 322 655

Executive Summary

Alcatel is pleased to make a submission to the Department of Communications, Information Technology and the Arts (DCITA) discussion on the design of Broadband Connect and Clever Networks, the two regional broadband programs announced in August 2005 under the new \$1.1 billion Connect Australia package.

Alcatel would like to continue to play a leading role in improving Australia's economic outlook and standard of living by ensuring that the community has access to a rich variety of broadband services, wherever they live. The Australian Government also has a key responsibility to develop conditions to drive broadband penetration as well as encouraging and supporting appropriate investment in infrastructure and services.

To assist the Government in achieving these objectives, our submission makes a number of key recommendations. They are:

Maintaining equivalent services

- Broadband service equivalence needs to be considered more deeply than 'City Vs Bush'. Australia's international competitiveness depends upon equivalence with our OECD trading partners.
- Large scale next generation investment is necessary for Australia to maintain its OECD position and is unlikely in the present climate. Government intervention is required to encourage and support investment.
- Broadband services should be compared in terms of the supported application set, rather than raw throughput.

Government responsibility to support investment

- Long term government support is required to maintain the equivalence of rural and regional services.
- Alcatel encourages policies and programmes which aim to manage the consumption of our telecommunications resources to ensure that minimum application performances can be met.
- Encouragement of investments in long term assets must be structured to keep pace with ongoing rapid technological advancement. Incentives should be regularly reviewed to maintain their relevance.

Broadband deployments must make appropriate use of technologies

- Regional Australians will be best served with a balanced mix of access technologies: FTTN and FTTP in areas of greater population density, wireless and satellite in areas of lower density.
- Wireless broadband access fulfils two important but different community needs: (a) emulating fixed broadband access where fixed next generation access is not practical and (b) providing the convenience of mobility. Separate consideration must be given to the equivalent provision of each.



Promoting broadband in regional Australia

- Improved regional broadband will help reduce the cost of providing and improving access to health, educational, government and retail services. Australians living long distances from places of work will have better access to the workforce.
- Benefits will not be realised by rural and regional Australians until they are understood. The government should expand its activities to promote awareness of broadband access, ICT and their benefits to rural Australians.

A holistic approach to backhaul and access

- Broadband access and backhaul are intrinsically linked. Backhaul network constraints particularly affect rural and regional Australians. Policies and programmes should encompass a holistic approach for a successful 'bush' outcome.

Appropriate development of applications

- To encourage the viability of new services and applications, they should be targeted towards all Australians, not just regional and remote communities.

About Alcatel

Alcatel is the global leader in broadband access technologies and has designed and deployed fixed and mobile broadband networks in most of the world's leading economies.

Alcatel Australia supplies the infrastructure for a substantial part of Australia's residential DSL community, making it a leader in helping Australians access the advantages of a digital lifestyle. Our solutions achieve advances in DSL, fibre optics, wireless and satellite access that help companies and individuals get maximum benefit from fast Internet services.

Alcatel's commitment to Australia is not new. We have been part of the Australian telecommunications fabric since 1895.

Alcatel's leadership in the development of Australia's communications infrastructure has included the country's first undersea cable network, the introduction of broadband Internet, the country's first 3G mobile network (m-Net) and the world's longest optical link, between Adelaide and Darwin.

Considerations for Government

Enabling equitable access to broadband services is critical to Australia

Investment in Information and Communications Technologies (ICT) and most recently, specific investment into broadband, have been directly linked with social and economic development of OECD countries.

DCITA's Occasional Economic Paper entitled "Productivity Growth in Service Industries", April 2005, (ISBN 0642 752 877) provides strong corroboration for the importance of ICT to the Australian economy. In speaking about the drivers for Australian labour productivity growth between 1984/5 and 2001/2, the report says...

"that after taking away the effect of increased capital spending per worker, technological factors (the ICT revolution in particular) accounted for between 59 and 78 per cent of productivity growth in service industries. ... The general pattern of results from numerous regressions reported in this study, and the earlier one on productivity growth in manufacturing, points to the conclusion that the main drivers of productivity growth in Australia over the last two decades were ICT related innovations rather than changes in the economic environment."

The report's conclusions underscore the importance for ongoing government support and active intervention to leverage new communications technologies to maintain and propel Australia's international standing and competitiveness. Read in the context of the present discussions surrounding the evolution of urban broadband access and in light of the Broadband Connect and Clever Networks programmes, the conclusions give pause for thought.

If investment and network upgrades to the latest technologies are to be preferentially focused in particular segments of the community, such as in Australia's largest metropolitan areas (as proposed), the remaining communities will be disadvantaged. The Australian government thus has an overarching responsibility to intervene to ensure the advantages of equivalent broadband are equitably offered to all Australians, regardless of their location.

However Australia needs to consider the issue of equivalence more deeply than the 'City Vs Bush' aspect which has captured our nation's attention to date. Australia's overall position has been diminishing in many important OECD broadband indicators. Countries including Italy, France, The Netherlands, Sweden, Korea, Japan, Hong Kong, Canada and the USA provide examples where entry level broadband services support greater than 1 Mbit/s download throughput and include multi gigabyte download allowances as standard. Australia's present access infrastructure is in urgent need of transformation to restore the equivalence our nation has already conceded.

Without government support, Australia's position is set to decline further in comparison to trading partner countries that have embarked upon significant next generation network upgrade programmes. To maintain Australia's standing, a cost-effective, reliable and high quality next generation broadband network is required to support a range of emerging telecommunications applications.

A next generation architecture is required for the country

Australia's current broadband deployment architectures cannot deliver the capabilities required by broadband applications emerging in rest of the world. Regional communities in particular stand to benefit enormously from these capabilities, or indeed, be severely disadvantaged by not having them. Some examples include:

- Isolated Australian families having equivalent and instant access to government and private services through online means – including educational, health, community support, financial and retail.
- Improved broadband access to make telecommuting viable for more rural and regional Australians. In industry sectors such as ICT, improved telecommuting will have an important future role helping those living significant distances from potential employment to gain employment and to better manage the balance between work and private life. Telecommuting also promises to boost part and full time employment for members of isolated families, improve productivity by saving commuting time, and in concert with other measures, play a role helping meet national energy and greenhouse targets.
- Agri-business is becoming increasingly dependent upon ICT innovations: remote management of water and livestock, weather forecasting, feed management, financial management and access to online markets. The underlying basis for these applications is speedier access to larger volumes of data. Improved broadband will help maintain Australia's international competitive edge.
- Small rural and regional businesses have an opportunity to establish on-line shopfronts and electronic business-to-business links, expanding their markets and reducing their costs. Improved broadband and increased community usage will establish sustainable rural enterprise which will create and protect employment in the area.
- For most Australians living in rural and regional areas, the monthly cost of telephony is significant because of their greater reliance on long distance calling. Emerging IP telephony services promise significant savings. Improved broadband access could allow many families to reduce their overall telecoms expenditure, even when including the additional cost of broadband access.

To enable delivery of these applications, Australia requires a new telecommunications access infrastructure. As well as requiring greater throughputs than the capability of Australia's current access infrastructure, many emerging services specifically rely upon dramatically greater upstream capabilities (i.e. from the subscriber towards the network).

Australia's broadband access requirement is a constantly evolving target

Historically, data access technology has demonstrated a remarkably consistent growth pattern with a more or less consistent growth rate of around 50 per cent per annum sustained over a quarter century. With the coming availability of mass market fibre access and its deployment in many other parts of the world, there is every reason to expect that this substantial rate of growth will continue for the foreseeable future.

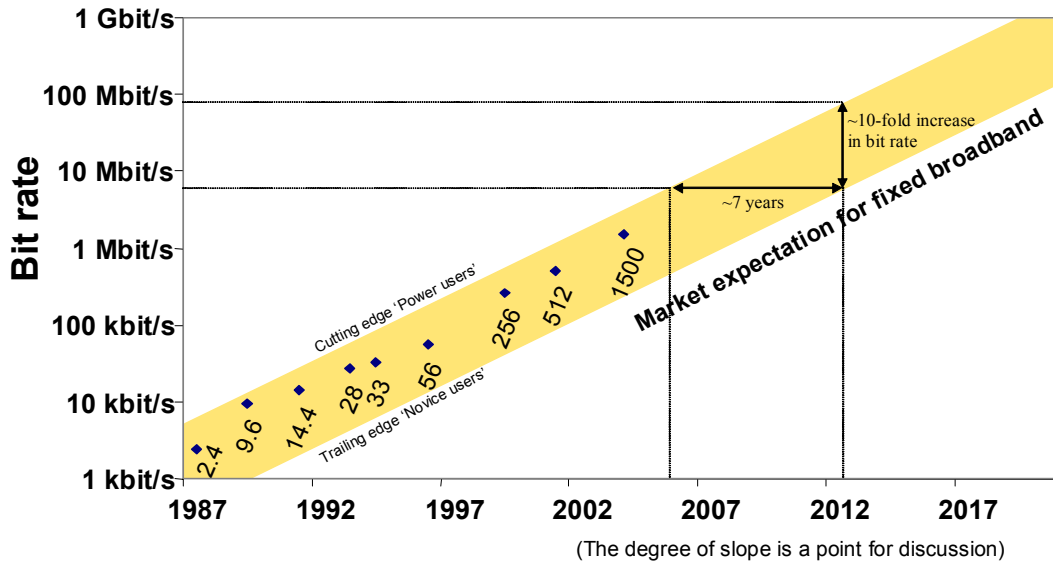


Figure 1 Bands of downstream (i.e. from the network to the end user) access rate deemed to be 'acceptable' for broadband - based on historic data and projected into the future

Figure 1 shows us that it is vital that broadband investments are structured with long term requirements in mind. Short term broadband solutions will inevitably have a limited life. If today's broadband access problems are addressed with inappropriate remedial compromises, subsequent solutions will be required within a short timeframe and the overall cost to the community could be much greater.

Figure 1 also highlights technology's progress and the growth of downstream throughput. Australia's present access network has been optimised for Web access – an application which has the characteristic that most information flows towards the end user. Some emerging applications, including telecommuting, remote health management and network based collaboration require substantially greater upstream (i.e. from the end user towards the network) capabilities. The market and technical indications suggest that upgrading upstream throughput may be even more important than downstream.

Australia should leverage the best of fixed and wireless technologies

Australia's population density and geographical distribution is unique. Consequently, Australia requires a balanced mix of access technologies, each optimised for particular demographics, to keep up with our evolving needs. Several key access technologies are necessary to ensure equitable access to services across the continent.

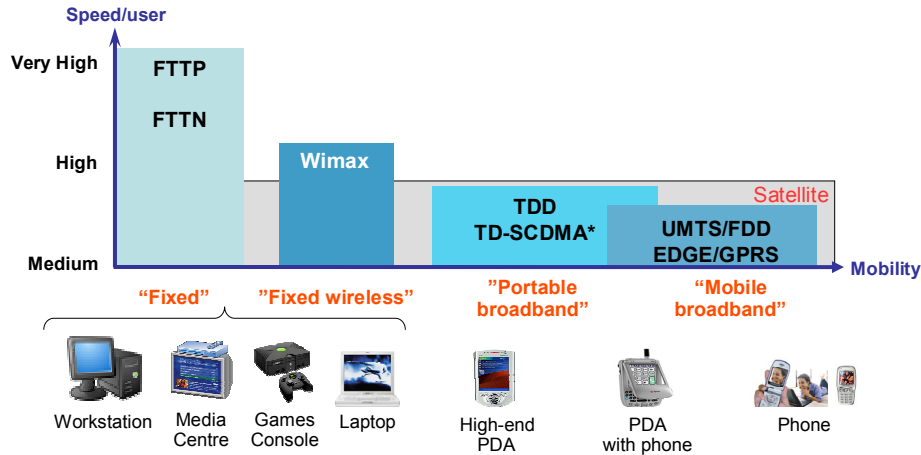


Figure 2 The capabilities of different access technologies for supporting broadband applications. Different types of devices are typically associated with each class of access technology.

Fixed broadband access, both copper and fibre based, is required to match leading OECD capabilities in urban, suburban and higher regional living densities such as around town centres.

Wireless broadband, both terrestrial and satellite, is required to emulate fixed access for Australians living outside of a town or city. For most regional Australians, terrestrial wireless access is the best alternative so that the limited satellite capacity can be reserved for the most remote Australians for whom no other form of access is possible.

In addition to emulating fixed broadband access, terrestrial wireless broadband has an important and independent role to play. Portable (or mobile) broadband applications need to be provided for all metropolitan, regional and rural Australians. Mobile broadband applications have significantly reduced network requirements compared with the most demanding fixed broadband applications. This means the dimensioning and provisioning of a 'mobile wireless' access network is significantly different from the dimensioning and provisioning of a 'fixed wireless' access network, even though the underlying wireless technology might be similar (or indeed the same) for both cases.

National telecommunications programs should ensure that funds are directed to encourage the most appropriate technologies for each geographic and demographic situation. Projects targeted towards fixed and mobile applications should be clearly differentiated and managed accordingly.

Fixed broadband access

Both now and within the foreseeable future, fixed broadband access will provide the best service for most urban, suburban and town-centre living densities. Simply stated, fixed access technologies dedicate substantially greater access capacity on a per user basis (contrasted with shared wireless access). Fixed infrastructure has a significantly longer investment life.

The majority of today’s fixed access is exchange-based and uses copper pairs. Although most of Australia’s broadband circuits use ADSL, state of the art copper-centric broadband is based upon ADSL2+ technology. Technically, ADSL2+ is capable of sustaining 12 Mbit/s of throughput to every user living within approximately 1.5 km of their exchange, either metropolitan, regional or even in a rural township. In total, that’s less than 40% of the Australian population.

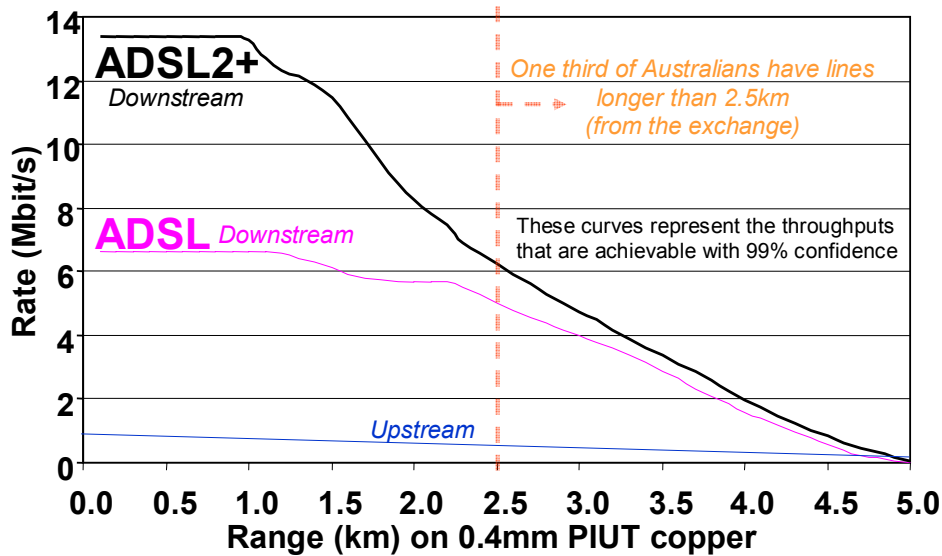


Figure 3 All forms of DSL are technically constrained and can deliver the highest throughputs only on the shortest lines

In order to deliver equivalent services beyond the 40% limit, Australia’s exchange based architecture needs to evolve to take fibre beyond the exchange and deeper into each community. The two alternative approaches are Fibre to the Node (FTTN) and Fibre to the Premises (FTTP)¹.

Alcatel has developed a tutorial session on the subject of the capabilities and limitations of each of the different access technologies and would be pleased to provide workshops for Government and industry stakeholders.

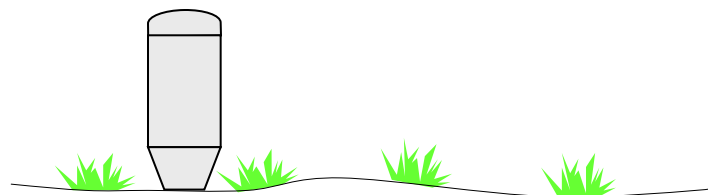


Figure 4 The familiar ‘pillar’ can be found in the heart of every Australian community generally serving fewer than 200 homes

Almost every Australian home connected to the copper access network is served by a “pillar”, depicted in Figure 4.

¹ Fibre To The Premises (FTTP) is often called “Fibre To The Home”. Fibre To The Node (FTTN) is often called “Fibre To The Curb”. The terms can be used interchangeably.

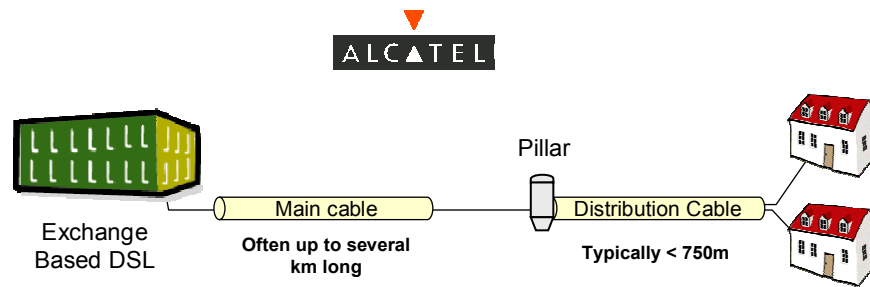


Figure 5 Although most Australian access is today based on copper from the exchange to the end user, the 'pillar' is the closest location from which next generation DSL services can be deployed

In metropolitan areas, pillars are typically located within ~750 metres of the end user as shown in Figure 5. In many Australian towns, homes are also located in reasonable proximity of the exchange or pillar such as to support higher capacity ADSL2+ throughputs. Regardless of location, the distance from end user to pillar is always shorter than the distance to the exchange, often significantly shorter.

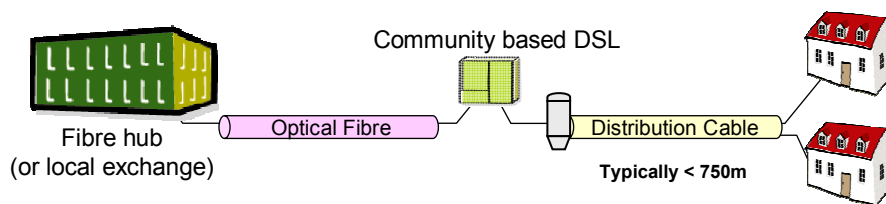


Figure 6 Fibre To The Node requires deployment of DSL equipment into each community

Because the pillar is the closest accessible cable location to the end user, it is the ideal location at which to deploy FTTN equipment, as shown in Figure 6. By replacing the main cable with fibre, copper distances can often be reduced by several kilometres, significantly improving the quality of broadband access, enabling more demanding applications.

Fibre To The Premises (FTTP) or Fibre to the Home (FTTH), which extends fibre to the residence and eliminates copper altogether, has clearly emerged as the long term preferred broadband access technology. Major deployments are underway or being planned in most of the OECD leading nations.

The nature of fibre cables can be likened to the copper cables which currently provide the majority of Australia's telecommunications access. Copper cables have fulfilled this access role for the best part of the previous century. Fibre cables are increasingly expected to take over this responsibility for the next century and beyond.

Today, FTTP is becoming the most appropriate access for every Australian green field estate (i.e. the development of a new community or sub-division), having been acknowledged in many other OECD markets to be equivalent or even less expensive than the deployment of traditional copper based telephony and broadband. Deployment of fibre into existing communities however requires a greater investment than for new communities because of the necessities to meet stringent local planning requirements, work around existing facilities, prepare homes for the termination of fibre and to manage service transition with the least disruption. The return on the brown field (i.e. existing estate) investment brings only an incremental revenue gain compared with revenues already being returned on the existing infrastructure. In contrast to green, brown field FTTP investment proposals are currently difficult to unequivocally justify.

In the long term, FTTP will inevitably play a substantial role in the delivery of advanced applications too, however, due to the magnitude of the task ahead, its deployment will be a long and costly transition. For this reason, FTTN provides a logical, cost-effective step towards FTTP in existing communities. FTTN supports substantially enhanced broadband applications at a fraction of the cost and can be deployed comparatively rapidly. FTTP is therefore likely to be deployed in targeted areas in parallel with a broader FTTN roll out.

Although there have been scattered examples of both FTTP and FTTN investments in Australia today without explicit government support, the projects have been relatively small scale and have been targeted towards communities promising the most favourable returns. Larger scale deployments, which are clearly necessary to maintain Australia's OECD competitive position, are a remote possibility in the present climate.

Government participation and support will be a vital catalyst to initiate Australia's brown field transition towards FTTN and FTTP. It is vital for the government to act urgently to establish conditions to encourage and support investment.

Wireless broadband for delivering fixed access

It is not practical to consider the deployment of new fibre routes or FTTN for rural Australians living beyond the outskirts of their closest township. Wireless technologies specifically optimised for delivering broadband (i.e. WiMax) can help by expanding the broadband footprint and are shaping up to provide the primary form of broadband access in minor and outlying rural areas.

Although wireless is a shared access medium and the sustained capacity per user might be much lower than for a cabled access technology such as FTTN, fixed wireless access can support many of the same applications when deployed in areas with lower population density. This is particularly pertinent outside townships where population density falls off.

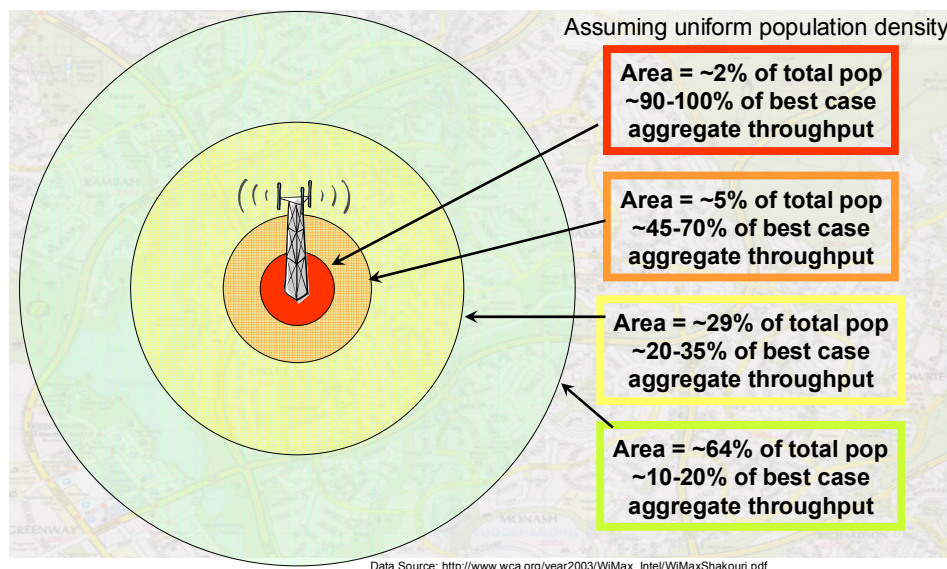


Figure 7 Wireless throughput diminishes predictably with increasing range (although many factors combine to influence throughput)

Just as for copper, it is a fundamental technical characteristic of wireless broadband access that in order to deliver higher throughput services, distances must decrease. If uniform population density is assumed, wireless throughput diminishes with increasing wireless range as shown in Figure 7. However, other factors also combine to influence wireless throughput, such as antenna installation (indoor, outdoor, high gain, simple); the sophistication of the end user's wireless equipment (eg. PDA, portable device, advanced device); terrain; weather; foliage. Thus it is not possible to present a definitive throughput versus distance graph for wireless as we have for ADSL and ADSL2+.

Even with the best equipment, conditions and the most favourable terrain, people living further from the base station will inevitably receive lower wireless throughput than those living closer. Also, as more subscribers sign-up for wireless broadband from a particular base station, the performance for every existing subscriber is diluted. As performance diminishes, broadband applications which may have previously been supported with

headroom may start to degrade or cease to function, particularly for those furthest from the base station.

Degradation of application performance as described can only be mitigated by provisioning additional spectrum or by deploying new base stations in the fringe areas with appropriate high capacity backhaul to those new sites. In establishing guidelines and programmes which encourage the deployment of wireless broadband access, it is imperative that specific applications be nominated, performance levels defined and performance and availability monitored so that attention can be paid and ongoing upgrade be encouraged as required.

It is absolutely certain that long term government support is required to facilitate the ongoing upgrades which will be required to maintain broadband equivalence for rural and regional communities. Government policy and subsidies should continue to be structured with long term objectives and targets in mind.

Satellite Broadband Access

Despite being the most expensive broadband access option, satellite will continue its role of providing access to the most remote Australian homes. It is the only practical option when fixed and wireless (terrestrial) broadband access is not possible.

Because satellite capacity is shared across the Australian continent, the performance of broadband applications is particularly sensitive to increased take up and usage. In order to maximise performance, it is imperative that the highest priority be given to improving the coverage of the alternate terrestrial technologies (fixed DSL, FTTP and wireless) so that the limited satellite capacity can be conserved for those that have no other option. Even still, satellite is unlikely to ever be able to achieve equivalence with terrestrial access for every broadband application.

In order to maximise Australian satellite broadband performance, it would be ideal if it would be possible to set a maximum satellite subscriber target. As an example, a ceiling satellite target could be set at (say) 10,000 subscribers, i.e. the most remotely located Australian homes. However terrestrial access providers have a significant task ahead if they are to improve coverage to all but Australia's 10,000 most isolated homes. Today, a satellite subscriber target many times this ideal objective would be more practical.

Alcatel encourages policies and programmes which aim to manage the consumption of Australia's telecommunications resources to ensure minimum application performances can be met. Being our most constrained telecommunications access resource, satellite capacity is our most important infrastructure which could be managed in this way.

Backhaul is a major issue for regional, rural and remote Australia

Because of the absence of sufficient backhaul capacity outside metropolitan areas, enhanced broadband services cannot practically be delivered to rural and regional Australians. Thus like satellite capacity, Australia's backhaul capacity is another bottleneck resource.

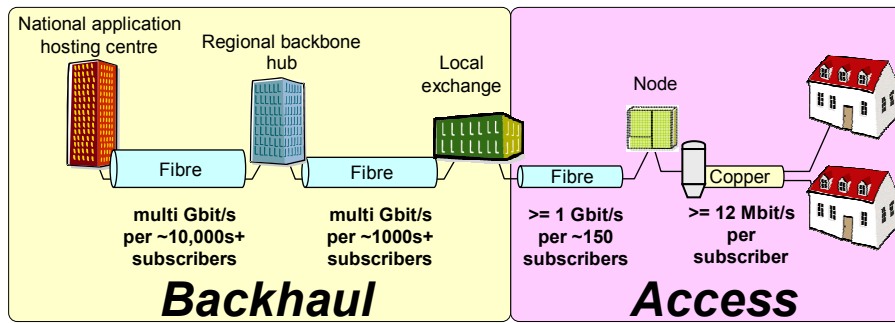


Figure 8 The Fibre To The Node architecture cannot deliver enhanced applications without enhanced backhaul. Terrestrial wireless similarly requires enhanced backhaul to support emerging applications.

Figure 8 shows that in order to sustain 12 Mbit/s services to the residents of a community, it is typical to provision each node with a fibre supporting at least 1 Gbit/s. In the future, even higher rates will be required to support higher throughput access. The traffic from many different communities is aggregated at the local exchange. In order to sustain 12 Mbit/s services to the end user, the backhaul from the local exchange to a regional hub must be provisioned with an even higher capacity - amounting to multi gigabits per second.

Australia's regional communities require multi gigabit backhaul to every exchange. Without backhaul upgrade, access providers are unlikely to install next generation fixed and wireless broadband because they will be unable to offer subscribers the enhanced services necessary for them to achieve an appropriate return on their access investment.

Regional broadband services will continue to lag the capabilities available in the cities until regional communities are served with backhaul that is equivalent to that available to metropolitan exchanges.

Much of Australia's regional backhaul network is already fibre-based. It is important to recognise that backhaul infrastructure consists of both fibre cables and the transmission equipment which send data over the fibres. Many regional and rural transmission systems were originally dimensioned to support basic fixed and mobile telephony and dial-up Internet access.

In many fibre-connected towns, the existing transmission equipment is not capable of supporting enhanced broadband services because of its limited capacity. Upgrading transmission equipment could significantly improve backhaul to those towns without the need to deploy new fibre cable routes and this could be achieved at a fraction of the overall cost. Appropriate consideration should be given to projects which seek to upgrade existing backhaul infrastructure in the interest of maximising the efficiency of the limited government contributions.

Key Recommendations

Minimum service standards need to be defined

Alcatel is concerned to read comments and questions in the discussion paper relating to whether or not there should be minimum broadband specifications. Existing HibIS service tiers fall well short of matching the capabilities of ADSL2+ services which several metropolitan access providers are already deploying. Thus bare-minimum HibIS solutions would deliver services to regional end users which fall well short of equivalence with those available to metropolitan subscribers.

Alcatel suggests that the government should indeed set minimum capabilities. Different broadband solutions have different characteristics and various applications could be

implemented in different ways on different platforms. Thus it is inappropriate to solely focus upon peak download speed to define the standard of service.

Broadband services should be compared in terms of the supported application set, rather than raw throughput. This approach would also be easier for the community to understand. The required throughput (or speed) is never-the-less an important consequence of the application set (or service) and the technologies used to implement the application, but it is the potential to use applications which is the most important issue for regional Australians.

To date, there is no accepted definition of an application set and hence no basis upon which to establish guidelines about access throughput and other access characteristics. Given the pace at which broadband services are evolving, throughput requirements should be evolved annually, in line with technology and service advancement.

Technology expectations should keep pace with global developments

The department's discussion paper indicates that ADSL is the reference broadband technology. While there is value in providing ADSL in some parts of Australia, it should be recognised that virtually all deployments of new DSL equipment in Australia today are based upon ADSL2+. Alcatel expects the focus to shift again within 18-24 months towards even faster and more reliable technologies such as VDSL2 and ultimately FTTP / FTTH deployments will become the most important.

Alcatel's recommendation is that the relevance of incentives should be regularly examined so that guidelines keep pace with technological progress. Focus should be given to those technologies that are actively being deployed rather than those (such as ADSL) which were deployed in previous years but are no longer preferred for new investments.

The issues of 'access' and 'backhaul' are intrinsically linked

The issues of access (outlined in Broadband Connect) and backhaul (considered separately in Clever Networks) are intrinsically linked. The absence of metro-like backhaul discourages regional access providers from deploying next generation access platforms. However, without these platforms, higher value broadband applications cannot be offered to regional subscribers and therefore less capital will be available for upgrading backhaul. It's the chicken and the egg syndrome!

In structuring the incentives for investment in regional and rural Australia, Alcatel encourages the government to develop policies and programmes encompassing holistic approaches to enhance backhaul and access simultaneously.

Even with a coordinated approach towards the upgrade of regional and rural access and backhaul, the economics for deploying urban-equivalent capabilities is likely to remain questionable. The government's incentives will continue to play a critical role to facilitate rural and regional investment. Without ongoing intervention, the services and applications which become available to rural and regional Australians are unlikely to ever catch up with those available in cities.

Policy and incentives need to extend the broadband footprint without increasing the regulatory burden

To date, most discussion has surrounded the improvement of broadband access. Broadband services and applications however constitute core, backhaul and access infrastructure, each working together to deliver the end user experience.

Backhaul and core constraints particularly affect rural and regional Australians and upgrading capabilities is necessary, is ongoing and will be a long term task. DCITA needs to avoid inappropriately encouraging an increased broadband access footprint without equivalently and simultaneously ensuring the upgrade of core and backhaul capabilities. A holistic approach is required to ensure the delivery of the best services possible.

The delivery of key services should not be aimed towards regional Australians alone

The emphasis on development of new services and applications for regional and rural Australians alone is misplaced. New services and applications should be targeted towards all Australians, not just regional and remote communities.

The cost and implementation of applications is largely independent from whether the target audience is rural or metropolitan (not withstanding the availability of appropriate access and backhaul). In order to maximise the chance of market success, it is important that an application developer targets the largest possible addressable market.

Government application development programmes and incentives should be structured to encourage the broadest possible target community to make the delivery of services to the ‘bush’ feasible. Application developers seeking support should be required to demonstrate that the target application will meet the needs of Australian city dwellers as well as those of regional and rural communities.

There needs to be further promotion of the value of broadband in regional Australia

In order to better leverage the benefit of improved national broadband availability, it is important to continue to proactively increase the level of community awareness of the applications and benefits. Despite significant government and industry effort on this issue, it is still the case that Australians living in metropolitan and major regional areas have a much higher degree of familiarity with broadband and its applications than those in smaller regional and rural areas. Higher broadband availability in metropolitan Australia naturally provides greater exposure to broadband in the workplace, at school and amongst friends and family.

Alcatel’s recommendation is for continuing funding to further increase the level of broadband awareness in regional and rural communities. Specifically, we believe there would be value in the development of transportable broadband demonstration centres (to be set up in local shopping centres, school fetes and libraries), coupled with sponsorship of local ‘broadband champions’ who could assist residents to gain hands-on experience of broadband services and applications – in particular around e-health, e-education and small business.

Other initiatives within the program could include:

- an improvement in the ratio of terminals to students in regional high schools
- the deployment of more free public-access broadband terminals in all regional schools, libraries, community centres and other government offices in regional areas
- improved on-line government shop-front services for all government facilities

Conclusion

The Broadband Connect and Clever Networks programs have potential to play an important role in the evolution of the telecommunications industry in Australia, and also impact the realisation of the country's overarching socio-economic targets and our ability to truly compete on a global scale.

While the Connect Australia package is to be commended, it is Alcatel's view that more attention is required.

For the Broadband Connect and Clever Networks programmes to have a substantial impact on addressing Australia's broadband challenges, they must form part of an overarching national vision for the development of a cost-effective and reliable next generation broadband access infrastructure to enable world-class services for all Australians. This vision and framework should articulate a national architecture plan, regulatory environment and investment incentives as well as the funding packages.

There is no question that enhanced broadband development will underpin the nation's economic outlook and improve our standard of living.

Australia's current broadband deployment architectures cannot deliver the capabilities required by broadband applications emerging in rest of the world. Regional communities in particular stand to benefit enormously from these capabilities, or indeed, be severely disadvantaged by not having them.

The real issue is how we collectively ensure that Australians – in both metropolitan and regional locations – have the capability to access broadband applications that are developing in the rest of the world.

As a major international supplier of broadband technologies, Alcatel is pleased to have had this opportunity to participate in this ongoing discussion of national importance.