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BROADBAND INTERNET

A REPORT ON BROADBAND INTERNET CHALLENGES IN FORDE AND BEYOND

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EXECUTIVE SUMMARY

Broadband Internet challenges were investigated from the ground up in the Queensland electorate of Forde. Containing a mix of outer Brisbane suburbs, small towns, semi-rural and rural living, Forde experiences a broad cross-section of issues in the provision of Broadband Internet services.

Retail Challenges

Chapter 2 covers retail related concerns brought to our attention. Broadband Internet retailers are relatively unregulated and some practices are of concern. These practices include:

- Bad advice on ADSL availability;
- Misleading advertising of broadband speeds;
- Faulty services; and
- Unjustifiably high excess data charges.

We believe that regulation may be necessary to protect consumers in this area. Our experiences also suggest that the Telecommunications Industry Ombudsman (TIO) is currently overwhelmed, partially as a result of these behaviours.

Technical Challenges

Chapter 3 presents an overview of Internet technologies. ADSL and ADSL2+ are the ideal, as they are generally fast and reliable. Many people cannot access this technology, leaving them with wireless or satellite Broadband Internet. These are less reliable, have latency issues and are more expensive for high volume users. Many people are stuck on dial-up or the more valuable ISDN, however ISDN is to cease being accessible to residential customers at the end of 2008.

Broadband Internet over Power Lines is an emerging technology not yet suited to mainstream usage. Extel Technology provides options for extending the range of ADSL, which should not be disregarded. The Rudd Government Fibre to the Node (FTTN) network is a far more realistic proposition than Fibre to the Premises (FTTP).

Policy Challenges

Government policies relating to Broadband Internet are reviewed in Chapter 4. Our largest commitment is the National Broadband Network (NBN) policy for a FTTN network. The obstruction by the Opposition to these plans is to be condemned. Issues of ownership of this network and specific problems that the network will resolve are of interest. FTTP is a long term ideal that should be designed into the FTTN network. The NBN is a more advanced initiative than the abandoned Opel Network.

The Australian Broadband Guarantee initiative provides Government subsidised wireless and satellite services through private companies. Discounted services through this initiative are similar in price to ADSL Broadband Internet services for most customers. Data charges remain higher, so high volume users will still pay far more for their wireless or satellite service than for ADSL.

Telstra's Universal Service Obligation (USO) is met by a slow dialup data speed. The Digital Data Service Obligation (DDSO) requires slightly faster than a dial up speed, but at commercial rates and

not necessarily through a phone line. These obligations could be expanded but Government payments to the service providers would have to increase accordingly.

Infrastructure Challenges

The challenges in providing Broadband Internet due to infrastructure, outlined in Chapter 5, are not simple. They include:

- ADSL port availability at exchanges and large pair gain systems.
- ADSL port capacity (room) at some exchanges and some large pair gain systems.
- ADSL compatibility of some exchanges, some large pair gain systems and all medium fibre pair gain systems and all small copper pair gain systems.
- Transmission degradation due to distances from exchanges over copper lines. ADSL can only be provided within certain distances of exchanges or nodes.
- Pair Gain technology, which splits phone lines and normally rules out ADSL.

We need to carefully consider which problems will be overcome with Government funds. We note that despite previous indications, pair gain technology appears to still be used relatively recently in Forde. This practice needs to be phased out.

Political Challenges

The interactions of Broadband Internet with the political system are reviewed in Chapter 6. Broadly, public sector efficiency issues have been replaced with privately owned infrastructure issues.

There are issues surrounding public versus private funding. Private enterprise by design cannot take into account broader economic benefits of telecommunications investments. Government infrastructure investment also leaves less motivation for a company to invest, and the opportunity to blame the Government for commercial decisions.

Assuming continued private infrastructure, the Government needs to promote genuine competition. A consistent position needs to be developed in respect to infrastructure access and the wholesale treatment of ADSL and ADSL2+ ports. There is the possibility that infrastructure decisions can be made to block competition. The Government must be resilient to commercial interests and lobbying, resolutely making decisions in the best interests of the Australian people.

Short term infrastructure decisions of the past have left many newer areas of Forde unable to access Broadband Internet services. This problem is likely to reoccur in the future without enforced better planning. Whether additional conditions are placed on developers, telecommunications companies or both, new developments should not be left without Broadband Internet services.

The $4.7 billion of funding promised by the Rudd Government for the NBN should be politically exploited to provide maximum benefits. The infrastructure funded by this money must promote competition and look long term. Excess capacity for growth in developing areas is important, as is establishing a foundation for FTTP in the future. The NBN is an opportunity to reign in market behaviours that are not necessarily in the Interests of the residents of Forde and people of Australia.

Brett Raguse MP – Federal Member for Forde – 26 August 2008

Contents

Change Control

Date	Version	Author	Details
28 Jul 2008	1.0	Stuart Fenech	Initial version
4 Aug 2008	1.1	Stuart Fenech	Updates from meetings, reviews
8 Aug 2008	1.2	Stuart Fenech	Updates from Brett Raguse MP review
26 Aug 2008	2.0	Stuart Fenech	Constituent feedback; Executive Summary

Cover photograph: Telephone service, Running Creek Road, Running Creek, Queensland

1   INTRODUCTION

Many Forde constituents face significant difficulties in accessing Broadband Internet services. The reasons for this situation are many and complex. Following a number of enquiries, Brett Raguse MP, Federal Member for Forde, decided to commence detailed investigations on this subject through his office. This report follows the investigation of more than 100 individual constituent cases, along with interactions with stakeholder businesses.

1.1   BROADBAND

Broadband Internet is generally viewed as higher speed Internet services beyond what can be provided through 'dial up' access using a modem. While definitions vary, any connection of 256kbps or more is generally considered Broadband Internet[1]. Broadband services in Australia include Asymmetric Digital Subscriber Line (ADSL), wireless and satellite services, of which ADSL is the most desirable due to speed, reliability and price.

1.2   FORDE

Forde is a 3167km² electorate that stretches from outer southern suburbs of Brisbane through the Gold Coast hinterland, inland to the New South Wales border. Population centres include Loganholme, Waterford, Beenleigh, Logan Village, Jimboomba, Beaudesert, and Mount Tamborine. Conventional suburbs, including units and houses, are complimented by semi rural acreage, farms and national parks in most of the geographical area of the electorate.

Brett Raguse MP regards it as a great privilege to represent this large, diverse electorate. It is this diversity that makes Forde an interesting case study for Broadband Internet challenges. If there is a problem to be had with Broadband Internet, the chances are that it occurs somewhere in Forde. We hope that this allows us to provide some genuine insight into Broadband Internet problems not just in Forde, but throughout Australia.

1.3   SCOPE

This investigation is limited to Broadband Internet services. No attempt has been made to cover matters surrounding standard phone services, mobile phone services or other telecommunications matters outside of Broadband Internet.

1.4   OBJECTIVES

The objectives of this report are:
- To explain Broadband Internet challenges to a broad audience.
- To engage constituents and stakeholders in a practical and open discussion.

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[1] Wikipedia (2008), Broadband Internet access, http://en.wikipedia.org/wiki/Broadband_Internet, viewed 27 July 2008

- To bring attention to issues surrounding Broadband Internet access.

1.5   UPDATES

This report is intended to be updated as a result of new information, advice or contributions. We welcome and encourage contributions of stakeholders, including constituents, businesses and their representative organisations. All updates are listed in the Change Control section. Please ensure that you are viewing the latest version of this report by visiting www.brettraguse.com .

1.6   CREDITS

Thank you to all participants who have contributed to this document, from many individual constituents through to businesses. We particularly note the positive working relationship that Telstra has established with ours and other Federal Government offices.

1.7   CONTACT DETAILS

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2 RETAIL CHALLENGES

This chapter deals with retail issues raised with our office linked with Broadband Internet telecommunications challenges.

2.1 ADSL AVAILABILITY

When making enquiries regarding availability of ADSL Broadband, a number of constituents have reported receiving flawed advice. Constituents are told that they can receive ADSL Broadband, only to be informed some days or weeks later that this is not the case. Many constituents understandably find this frustrating and unnecessary.

Questions
What system is used to determine ADSL eligibility?
Could the system used to determine ADSL be improved?

Recommendations
Customers are given accurate information on whether or not they can access ADSL

2.2 CONTRACT TIMING

Constituents have alleged that ISP's make them sign ADSL Broadband Internet contracts prior to giving an accurate indication of whether or not the person can access ADSL Broadband Internet at their premises. It appears strange that a contract may be signed on a product that cannot be provided.

Questions
N/A

Recommendations
Ban on contracts prior to an accurate indication of whether the product can be provided

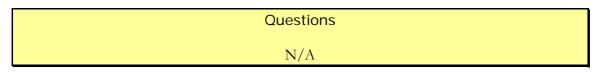## 2.3 ADVERTISED BROADBAND SPEEDS

A number of constituents have brought to our attention the fact that advertised Broadband speeds are not necessarily reflected in the provided product. We appreciate that there are technical reasons why full speed may not be deliverable. However, we are concerned about the accuracy of advertising in this area.

A Telstra case we investigated was with a constituent on an 8Mbps plan that could only ever achieve 3.8Mbps. Telstra noted that their residential product was a "best effort" service, meaning "equal to, or greater than, the acceptable minimum speed of 1.5Mbps downstream [download] and 256Kbps upstream [upload]."[2] As at July 2008, the 'fineprint' provided by Telstra[3] does not explicitly point out the speed of service that may end up being provided, though it is noted that for some members 'actual speeds may be less'.

There are a number of options that may resolve these problems:
- ISP's could be made to present a guaranteed minimum speed along with the percentage of time expected to provide 95% or greater of the claimed maximum speed.
- Phone lines could be tested and speeds determined by an ISP prior to signing a contract.
- A 'cooling off' period of nearly two months to allow customers to assess the performance and billing of their ISP.

This information would enable customers to make more informed decisions and prevent problems that result when customers receive a product that does not meet expectations.

Questions
N/A

Recommendations
Consideration of regulation on Broadband Internet plan advertising

2.4   EXCESS DATA CHARGES

Broadband Internet plans can be either shaped or unshaped. When a customer downloads a certain amount of data, a shaped plan has the connection speed slowed down ('shaped'), while an unshaped plan does not have the speed altered ('unshaped') and the customer is charged for additional data. These additional charges on unshaped plans, called excess data charges, often catch out unsuspecting customers and can be significant.

Telstra's plans provide examples of this practice. Telstra's 256kbps $29.95 per month ADSL plan allows only 200MB of data per month[4], which can be downloaded within three hours. Telstra's 1500kbps $39.95 per month plan allows 400MB of data per month, which can be downloaded within one hour. Additional downloads are charged at $0.15 per MB, which amounts to $153.60 per GB. On the 25GB 'BigPond Liberty' 1500kbps 25GB plan this will cost you $79.95 a month, but if you accidentally download 25GB on the 400MB 1500kbps plan, this will cost you $3,819.95 for one month.

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[2] Telstra, 28 July 2008, "Re: ADSL Broadband", e-mail to constituent (confidential)
[3] Telstra (2008), The Fineprint for Bigpond ADSL Broadband,
http://my.bigpond.com/internetplans/broadband/adsl/fineprint.jsp, viewed 27 July 2008
[4] Telstra (2008), Broadband ADSL Plans & Offers,
http://my.bigpond.com/internetplans/broadband/adsl/plansandoffers/default.jsp, viewed 27 July 2008

While Telstra has had plans of this type in place for years, Optus has also recently employed this lucrative trick[5]. Excess data charges are clearly being used in certain circumstances as a high profit trap for consumers. Very few consumers would choose to pay $0.15 per MB if they were aware of the commitment they are making (eg 1 gigabyte costs $150). By the time customers receive a large bill and realise what has happened, they are usually stuck on a two year contract.

We are not convinced that it is ethically acceptable to take advantage of less informed customers in this way. Consideration should be given to legislating for the end of this practice. This could be done in a number of ways, such as a cap on excess data charges. This would not affect most ISP's, as most ISP's offer shaped plans that are unaffected by excess data charges.

Questions

Should excess data charges be capped? (for example, to $20 per GB)

Recommendations

Regulation to end the practice of high excess data charges

2.5   CONTRACT LENGTH

A small number of constituents have raised concerns about the lengths of contracts involved in Broadband Internet services. While most contracts are for two years, some have been reported as being as long as three years. Interest has been expressed in shorter contract periods.

However, as contract periods are often used to recoup upfront costs, forcing shorter contract periods is likely to have the main effect of higher prices for those shorter contract periods. Therefore, while longer contract periods can be of concern, shorter contract periods may not necessarily be in the interest of consumers. There may also be short contract period implications for the Australian Broadband Gaurantee (see 4.2 Australian Broadband Guarantee).

An intermediate measure may be to ensure that customers on contracts that are later improved with faster speeds or higher download limits benefit from these changes. At the moment many customers remain stuck on earlier contract arrangements, despite improvements in the underlying plan.

An issue arises for existing contracts in wireless and satellite Broadband services. While many customers with these types of connections would prefer ADSL, they can not apply for ADSL or indicate interest in ADSL because of the cost of breaking an existing Broadband contract. This creates a situation where demand for and interest in ADSL in an area often looks weaker than it should.

Questions

Could Broadband Internet contracts be limited to two years in length?

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[5] Winterford, Brett (2007), Optus u-turns on monthly excess-data charge, Cnet, http://www.cnet.com.au/broadband/adsl/0,239035934,339284363,00.htm, viewed 4 August 2008

2.6   E-MAIL PORT 25

Port 25 is a communication channel used to send e-mail, provided to most Broadband Internet users by their ISP over the Internet. A constituent brought to our attention the issue of ISP's blocking the access of data port 25 to servers other than that ISP. In effect, what this means is that while connected to one ISP, you can not send e-mail through another ISP that has port 25 blocked. This can cause significant difficulties and inconvenience, particularly for Information Technology businesses.

On behalf of this constituent, we raised this matter and the possibility of regulation with the office of Senator the Hon Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, on the 22nd of February 2008. The reply from the Minister, received on the 4th of June 2008, stated that 'the Government has no current plans to regulate the blocking of port 25' and recommended the TIO and the Internet Industry Association (IIA) Internet Industry Code of Conduct.

Questions
Is the use of e-mail data port 25 an area that requires regulation?

Recommendations
That regulation of the use of e-mail data port 25 be considered

2.7   WHOLESALE-RETAIL COMMUNICATION

Customers of retailers, other than Telstra, have expressed significant annoyance at getting phone line faults rectified by Telstra. Customers, as with political office staff, have to approach the retailer rather than Telstra when there is a fault with Telstra infrastructure. Complaints are common that waiting times are long and that customer feedback and solutions are not forthcoming. We have no evidence of claims that Telstra retail customers receive preferential treatment from Telstra wholesale when compared to customers of other retailers.

We are not sure if there could be a better approach to this issue. There is merit in ensuring separation between wholesale and retail functions within Telecommunications organisations, yet we have indications that the current system is not working effectively for our constituents.

Questions
Are Telstra wholesale customers receiving fair and reasonable treatment?

Could a better arrangement for managing infrastructure faults be found?

Recommendations Monitoring of behaviour in this area

2.8   GENERAL CORPORATE BEHAVIOUR

It would not be possible to ignore the large number of grievances that have been aired about the behaviour of Internet Service Providers (ISP). These include:

- Providing faulty services – usually wireless.
- Claiming that services will work when they can not (particularly seen with wireless in the Buccan area).
- Receiving the Government Australian Broadband Guarantee funding for services that will not work.
- Enforcing lengthy contracts on services that are poor or below standards.
- Providing minimal information on problems – leaving customers in the dark.
- Difficulties in accessing staff with technical expertise to resolve problems.
- Misleading advice that suggests a Broadband connection may occur soon.
- Significant delays in providing agreed services.
- Allegations that ISP's claim individuals will have "more of a chance" of receiving ADSL if they go through that ISP – which is often an outright lie.

Approaches need to be considered for addressing the large range of grievances that are occurring in this emerging area. At the moment, the Telecommunications Industry Ombudsman (TIO) deals with a great number of enquiries, but is backlogged (two month waiting times as at August 2008). Regulatory options may need to be considered, such as forcing written replies to customer complaints to telecommunications companies within a specified timeframe.

Questions N/A

Recommendations Regulation of communications behaviour be considered Written information provided to consumers on their rights

3   TECHNICAL CHALLENGES

There are a number of different technologies that are available for the supply of Internet to residences. This section briefly reviews these technologies along with their advantages and disadvantages.

3.1   DIAL-UP INTERNET

Dial-up Internet access is a form of Internet access via a telephone line. The client uses a modem connected to a computer and a telephone line to dial into an Internet service provider's (ISP) node to establish a modem-to-modem link. This is then routed to the Internet[6]. Not a form of Broadband Internet, dial-up reigned supreme in popularity during the early days of the Internet in Australia in the 1990's. Most remaining Australian connections are at 56 kilobits per second (kbps).

While standard dial-up Internet is regarded as relatively slow, there are factors that can make it worse. The use of Pair Gain Technology (see 5.11 Pair Gain Technology) can reduce achievable speed to 28 kbps or lower. Many residents further away from exchanges report particularly slow connections and drop outs, which result from signal losses and interference. Complaints with dial-up Internet generally involve speed and the necessity of taking up a phone line.

Questions
Is dial-up Internet a technology that we want to support in the long term? Should there be minimum performance requirements for dial-up Internet?

Recommendations
N/A

3.2   ISDN INTERNET

Integrated Services Digital Network or Isolated Subscriber Digital Network (ISDN) is a "circuit-switched telephone network system", designed to allow digital transmission of voice and data over ordinary telephone copper wires, resulting in better voice quality than an analogue phone[7]. For Internet purposes, it allows up to 128 kilobits per second (kbps) over two standard telephone lines up to 20 kilometres from an exchange without blocking incoming voice calls.

Telstra stopped offering ISDN home plans on the 21st of December 2007 and plans to withdraw all of these plans on the 31st of December 2008[8]. ISDN 2 services are still available for businesses, but are more expensive that the existing residential services. A number of Forde constituents have been affected by the end of ISDN services.

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[6] Wikipedia (2008), Dial-up Internet Access, http://en.wikipedia.org/wiki/Dial-up, viewed 27 July 2008
[7] Wikipedia, Integrated Services Digital Network, http://en.wikipedia.org/wiki/ISDN, viewed 27 July 2008
[8] Telstra (2008), ISDN Home, http://www.telstra.com.au/isdn/pricing.htm, viewed 27 July 2008

Telstra's explanation of the reason for abandoning home ISDN[9] is:

"Since the initial roll-out of ISDN services, technology has advanced significantly, particularly with the introduction of the Next G Wireless Broadband network. Telstra's ADSL, Cable and wireless broadband services provide customers with better alternatives to ISDN. Through broadband, customers can expect faster services compared to IDSN Home and Bigpond ISDN depending on their chosen plan."

It appears that the Telstra abandonment of ISDN for home users was a financial decision. Unfortunately, ADSL, cable and wireless Broadband are often not available to customers in rural and remote areas. Furthermore, the costs for wireless and satellite services, where available, are far higher and often less reliable than the ISDN plans being abandoned. A number of Forde residents have therefore expressed disappointment.

Questions

Is ISDN a technology that we want to support in the long term?
Is ISDN still one of the best options for people unable to access ADSL?
What genuine alternatives do our constituents face to ISDN?

Recommendations

That ISDN technology not be completely withdrawn until the impact on existing customers is full understood and endorsed

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3.3 ADSL BROADBAND INTERNET

Asymmetric Digital Subscriber Line (ADSL) Broadband Internet is a form of DSL, a data communications technology that enables faster data transmission over copper telephone lines than a conventional voiceband (dialup) modem can provide. It does this by utilising frequencies that are not used by a voice telephone call. A splitter - or microfilter - allows a single telephone connection to be used for both ADSL service and voice calls at the same time[10].

ADSL is currently the most popular Broadband Internet form in Australia for a number of reasons. These include price, reliability, it does not interrupt voice telephone services and can provide relatively high speeds. ADSL plans have a theoretical maximum download speed of 8,000kbps and are typically offered at 256kbps, 512kbps, 1.5Mbps and 8Mbps download speeds.

ADSL2+ is ADSL's successor with a theoretically longer range[11], but ADSL2+ is offered by ISP's over a smaller range than ADSL. Many customers are close enough to an exchange or relevant equipment to receive ADSL but not ADSL2+, although the vice versa situation apparently can

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9 Whirlpool.net.au (2008), ISDN Home – RIP, http://forums.whirlpool.net.au/forum-replies-archive.cfm/863047.html, viewed 27 July 2008

10 Wikipedia (2008), Asymmetric Digital Subscriber Line, http://en.wikipedia.org/wiki/ADSL#ADSL_standards, viewed 27 July 2008

11 Internode (2008), Extreme ADSL2+, http://www.internode.on.net/residential/internet/home_adsl/extreme/, viewed 14 August 2008

occur. We envision that ADSL will continue to play a prominent role in Australian Broadband Internet services.

Questions
Will ADSL technology be used in the medium to long term?

Recommendations
That ADSL remain in use in the short to medium term

3.4   ADSL2+ BROADBAND INTERNET

ADSL2+ is an advancement of ADSL (see 3.3 ADSL Broadband Internet) that allows for higher speeds. ADSL2+ plans have a theoretic maximum of 24 megabits per second (Mbps) and are usually offered at 20Mbps and 24Mbps download speeds. The popularity of ADSL2+ is expanding rapidly, with it being only slightly more expensive than standard ADSL.

Questions
Will ADSL2+ technology completely replace ADSL?

Recommendations
That ADSL2+ technology be supported for Australia's telecommunication needs

3.5   CABLE BROADBAND INTERNET

Cable Broadband is a form of Internet access which differs from other forms of access by using the cable television infrastructure[12]. Cable Broadband has limited availability in Australia as it is restricted to where cable television lines have been installed. Cable Broadband in Australia delivers up to 20Mbps download speeds.

Few Forde residents utilise Cable Broadband. This appears to be a reflection on the lack of general take-up of Cable Television in Australia. As a result, Cable Television and Cable Broadband has limited availability locally and we assume that demand for Cable Broadband will not change much in the coming years.

Questions
Is Cable Television expanding in Australia anymore?

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[12] Wikipedia (2008), Cable internet, http://en.wikipedia.org/wiki/Cable_Internet, viewed 27 July 2008

3.6 WIRELESS BROADBAND INTERNET

Wireless Broadband Internet communicates over radio signal bands to deliver Broadband Internet. While wireless is available in some areas where ADSL fails and can provide additional flexibility for laptop users, it is generally viewed as less desirable than ADSL. The reasons include higher costs, interference, dropouts, security and patchy reception. A large number of Forde residents unable to access ADSL also experience poor wireless reception.

Wireless Broadband is offered over a number of private networks at speeds ranging from 512kbps up to 14.4Mbps. Speeds experienced by customers, in effect, are similar to that found from ADSL connections. Data charges also far exceed ADSL and ADSL2+, which are a strong deterrent to higher data volume users.

Telstra's NextG (850Mhz) network has proven particularly valuable for Wireless Broadband in Forde. NextG reaches most areas with minimal fuss, though some constituents have grievances with the prices and there are black spots, such as Cedar Grove. Most locations with moderate NextG reception (one or more bars out of five) can receive a good service with a NextG antenna.

Competitors, in the future, are likely to offer products with a similar effectiveness to the Telstra NextG network. The Australian Broadband Guarantee subsidisation of NextG or these future networks may satisfy complainants who are low to moderate data volume users. The Federal Government should remain open to discussions with market players willing to provide Australian Broadband Guarantee subsidised wireless services.

Questions
Could Telstra's NextG be offered under the Australian Broadband Guarantee scheme? Are excess data charges for Wireless Internet services reasonable?

Recommendations
Consideration be given to subsidising NextG services under the Australian Broadband Guarantee Wireless continue to be broadly supported by the Australian Broadband Guarantee

3.7 SATELLITE BROADBAND INTERNET

Satellite Broadband Internet communicates using radio signals to satellites to deliver Broadband Internet. While satellite is available in most areas where ADSL and wireless fails, it is generally viewed as less desirable than ADSL. The reasons include higher costs, interference, dropouts and security

weaknesses. Most Forde residents with Broadband Internet problems find satellite acceptable, but we still receive occasional grievances with reception.

Satellite Broadband is offered over a number of private networks in speeds ranging from 256kbps up to 1024kbps. Speeds experienced by customers, in effect, are similar to that found from ADSL connections. As with Wireless Broadband, data charges far exceed ADSL and ADSL2+, which are a strong deterrent to higher data volume users.

Questions
Is there any better solution than satellite for remote locations?

Recommendations
Satellite remains a Broadband option of last resort Satellite to continue to be supported by the Australian Broadband Guarantee

3.8   BROADBAND INTERNET OVER POWER LINES

Broadband over powerline (BPL) is a new service still in its infancy that may eventually permit broadband Internet data to travel down standard power lines. However, the system has a number of complex issues, the primary one being that power lines are inherently a very noisy environment. Every time a device turns on or off, it introduces a pop or click into the line. Energy-saving devices often introduce noisy harmonics into the line. The system must be designed to deal with these natural signaling disruptions and work around them[13].

In Australia, BPL received a lot of publicity in 2005, surrounding trials in Tasmania and New South Wales. While noting possible speeds of up to 200Mbps, significant concerns relating to interference with other radio communications services were noted[14]. Aurora Energy, who conducted Tasmanian trials, dropped their trials in November 2007, citing alternative technologies and better margins[15].

As at October 2007, it was reported that Australian telecommunications companies are still investigating BPL, but interference and regulatory issues were causing problems[16]. In April 2008, the technology was looking "very shaky" due to competing technologies, interference and the reluctance of utilities companies to move into telecommunications[17]. As at July 2008, the ACMA reports that the technology is still undergoing testing and is not yet available for public use in Australia[18].

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[13] Wikipedia (2008), Broadband Internet access, http://en.wikipedia.org/wiki/Broadband_Internet_access#Power-line_Internet, viewed 27 July 2008

[14] Hilvert, John (2005), Is powerline Internet here yet?, PC User,
http://www.pcuser.com.au/pcuser/hs2.nsf/web/EB98AEFFC9A4AF9DCA256F81007D5EA5, viewed 27 July 2008

[15] Aurora Energy (2007), Aurora shifts focus to fibre in telecommunications strategy,
http://www.auroraenergy.com.au/news/default.asp?file=27-november-2007.txt, viewed 27 July 2008

[16] Best, Jo (2007), Aussie telcos 'looking into powerline broadband', ZDNet,
http://www.builderau.com.au/news/soa/Aussie-telcos-looking-into-powerline-broadband-/0,339028227,339283381,00.htm, viewed 27 July 2008

[17] Hendry, Andrew (2008), Access denied: BPL turns to the home network, Computerworld,
http://www.computerworld.com.au/index.php/id;505194105, viewed 27 July 2008

[18] ACMA, What is Broadband over Powerline (BPL)?, http://www.acma.gov.au/WEB/STANDARD/pc=PC_2847, viewed 27 July 2008

Questions
Could power line Internet be an option in Australia?

Recommendations
Review overseas experiences with power line Internet Monitor developments with power line Internet

3.9   EXTEL TECHNOLOGY

Extel is an Australian company that has developed a number of solution to Australian Broadband Internet difficulties[19]. Extel's expandsl product[20] solves three problems:

- Exchanges or cabinets with little space or where it is uneconomical to install large numbers of dslams, to provide ADSL Broadband in an area. Extel solves this 'granularity' (size) problem with small self contained units.
- Situations where people are located too far from an exchange to receive ADSL Broadband. Extel solves this 'reach' problem with remote, waterproof dslams located closer to residences.
- ADSL Broadband 'blocked' due to loading coil or pair-gain technology systems. Extel solves this 'Broadband blocker' problem by locating remote dslams alongside the broadband blocker.

On face value, this remarkable technology has the potential to solve most Broadband Internet difficulties in Forde. The ability to provide ADSL up to 20 kilometres from an exchange, as well as overcome Pair Gain Technology problems, covers most difficult situations.

Telstra trialled Extel Technology in early 2005 and was looking at rolling it out in late 2005. Critics believe that Telstra decided against the move because they make more money convincing people to use the relatively expensive NextG network[21]. Telstra advises that this fell through due to installation costs, speeds delivered and alternative products being available[22].

Questions remain on the applicability of Extel's product. In particular, how will Extel deal with ADSL2+? The fact that ADSL2+ is offered over an even smaller range from an exchange may create problems with systems built around Extel systems designed for ADSL.

Questions

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[19] Extel (2008), Company Overview, http://www.extel.com.au/company/overview/index.html, viewed 27 July 2008
[20] Extel (2008), Expandsl, http://www.extel.com.au/products_solutions/expandsl/solution_overview.html, viewed 27 July 2008
[21] Corner, Stuart (2007), Telstra's Orwellian excision of Extel technology, ITWire,
http://www.itwire.com/content/view/13983/1095/, viewed 27 July 2008
[22] Telstra, 4 July 2008, "FW: A Compilation of Enquiries", e-mail to Stuart Fenech (stuart.fenech@aph.gov.au)

> How will Extel Technology manage next generation Broadband like ADSL2+?

> **Recommendations**
>
> Extel Technology be a consideration in Government funding

3.10   FIBRE TO THE NODE

Fibre to the Node (FTTN) refers to a network where optical fibre replaces copper to local hubs referred to as 'nodes' near homes. The network committed to by the Rudd Government is a FTTN network. Optical fibre is already used in Australia, so a full FTTN network can be viewed as an extension of the existing system than a completely new system.

> **Recommendations**
>
> Government FTTN support in the short to medium term

3.11   FIBRE TO THE PREMISES

Fibre to the Premises (FTTP) is an extension of FTTN where the copper is replaced all the way to businesses and residences. This allows for relatively fast ADSL data speeds compared to FTTN, but is substantially more expensive. It may currently be economical where distance from the exchange is short and customers are heavy data users eg business. FTTP is a long term ideal.

> **Recommendations**
>
> Government support for FTTP in the long term

4   POLICY CHALLENGES

This chapter covers Broadband Internet challenges with existing and previous policies faced by politicians and public servants.

4.1   NATIONAL BROADBAND NETWORK

The Rudd Government is committed to building a $4.7 billion National Broadband Network in partnership with the private sector. The National Broadband Network will connect 98 per cent of Australians to high speed broadband internet services – at a speed more than 40 times faster than most current speeds. This raises a number of high level questions.

Details of the National Broadband Network are scant at the moment. We know that it will be a Fibre to the Node (FTTN) network, which is promising in principle. We are keen to see proposals in light of the many technical and other challenges outlined in this report. Ownership issues will be paramount. The resulting network must provide maximum results for the Governments' investment.

Particularly crucial is the prioritisation of work funded under the National Broadband Network. We are of the view that locations of moderate population without ADSL access should be upgraded first. There are many locations in Forde that do not have ADSL access at the moment, while other locations already have ADSL2+.

In June 2008, the Coalition dominated Senate has decided to delay the National Broadband Network by referring it to a Senate Select Committee that will not report until March 2009[23]. The Nelson Opposition has made a series of grand statements including accusations of "deadline promises, cost blow-outs, consumer anxiety and regulatory uncertainty" to justify this act of obstruction[24]. Telstra[25] and the CEPU[26] have publicly slammed the enquiry.

Some criticism has been levelled at the network for not being Fibre to the Premises[27], which would be a substantially faster network. We believe that the cost of such a network is extremely prohibitive as it would require digging up and replacing of every copper phone line in the country. However, the FTTN network should be designed with future capacity and be able to deliver higher speeds. The final lengths of copper lines can then be replaced in the future without the need to upgrade the existing FTTN network.

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[23] Conroy, Senator the Hon Stephen (2008), National Broadband Network jeopardised by Opposition vandalism, Minister for Broadband Communications and the Digital Economy, http://www.minister.dbcde.gov.au/media/media_releases/2008/national_broadband_network_jeopardised_by_opposition _vandalism, viewed 27 July 2008

[24] Billson, The Hon Bruce (2008), Senate Inquiry into Labor's Broadband Fiasco, Shadow Minister for Broadband, Communications and the Digital Economy, http://www.liberal.org.au/info/news/detail/20080625_SenateinquiryintoLaborsbroadbandfiasco.php, viewed 27 July 2008

[25] Business Spectator (2008), Telstra slams Senate inquiry, http://www.businessspectator.com.au/bs.nsf/Article/Telstra-slams-senate-inquiry-FYNXV?OpenDocument, viewed 27 July 2008

[26] CEPU (2008), Opposition Moves to Delay Broadband Roll-out, http://www.cepu.org/news08/035.htm, viewed 27 July 2008

[27] Russell, Christopher (2008), Broadband network to be outdated at launch, The Advertiser, http://www.news.com.au/technology/story/0,25642,24094794-5014239,00.html, viewed 1 August 2008

4.2   AUSTRALIAN BROADBAND GUARANTEE

The Australian Broadband Guarantee (ABG) provides affordable Broadband Internet services to many residents of Forde. This initiative is aimed to "provide universal access to metro-comparable broadband services across Australia". The initiative provides financial incentives to Internet Service Providers (ISP's) to provide competitively priced wireless and satellite Broadband Internet services.

The services provided by the ABG, while often good, are not of the standard usually provided with ADSL. There can be latency and reception issues, and the services are rarely as reliable as ADSL. Costs remain substantially higher for users that seek larger monthly data downloads (eg. 10GB), and speeds are not comparable to that achievable with ADSL2+.

On the 13th of May 2008, my office wrote to Senator the Hon Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, in relation to the data cost concerns of higher volume users. The Minister's reply, received on the 10th of July 2008, noted significant improvements in this area from the additional $270.7 million in funding until 2012.

The upgraded ABG has been in place since the 4th of August 2008. The new programme increases the minimum monthly usage allowance to 3GB with shaped plans to 64kbps or a cap on excess data charges of 5 cents per MB[28]. While higher volume users will still face higher prices than from ADSL plans, 3GB is a great improvement on 1GB. This change will not benefit existing customers on the ABG.

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[28] Department of Broadband, Communications and the Digital Economy (2008), Australian Broadband Guarantee Program Guidelines 2008-09, http://www.dcita.gov.au/__data/assets/pdf_file/0019/85501/ Australian_Broadband_Guarantee_guidelines_2008-09.pdf, viewed 27 July 2008

4.3   OPEL NETWORK

OPEL Networks Pty Limited was a telecommunications provider that was to establish wholesale broadband services in regional areas of Australia in the form of WiMAX and ADSL2+ via a network of DSLAMs. The network was also to include terrestrial and undersea backhaul. The project is now defunct. It was a 50:50 joint venture between Optus and Elders[29].

The Howard Government allocated $917 million to the OPEL Networks joint venture, with the funding agreement signed on the 9th of September 2007[30]. In February 2008, Telstra attacked the slow progress of OPEL Network developments[31]. In April 2008, the Rudd Government decided that the OPEL Network would not proceed; citing failure to provide agreed 90% coverage of under-served premises and the superior nature of the National Broadband Network[32] (see 4.1 National Broadband Network). OPEL disputed the view presented by the Rudd Government[33].

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Recommendations

That the National Broadband Network replaces the OPEL Network

</div>

4.4   UNIVERSAL SERVICE OBLIGATION

Telstra's Universal Service Obligation (USO) ensures that telephone services and payphones are universally available throughout Australia[34]. Part of the telephone service obligation involves allowing a dial-up Internet service with a minimum throughput of 19.2 kilobits per second (kbps). This threshold, which equates to only 2.4 kilobytes per second (kBps), is so low that even a phone line using Pair Gain Technology will meet the data requirement.

In effect, there is no obligation to provide a phone line capable of maximum dial up Internet speeds (56kbps), let alone ADSL or ADSL2+. It may appear reasonable to toughen the USO, for example to provide a copper pair to all customers. However, toughening the USO in this area without fair compensation would place a burden on Telstra and its shareholders that would be difficult to justify on competition grounds.

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[29] Wikipedia (2008), OPEL Networks, http://en.wikipedia.org/wiki/OPEL_Networks, viewed 27 July 2008

[30] Coonan, Senator the Hon Helen (2008), New OPEL Project Underway, Minister for Communications, Information Technology and the Arts, http://www.minister.dcita.gov.au/coonan/media/media_releases/new_opel_project_underway, viewed 27 July 2008

[31] PC Authority (2008), Telstra attack over broadband 'secret', http://www.pcauthority.com.au/News/103441,telstra-attack-over-broadband-%E2%80%9Dsecret%E2%80%9D.aspx, viewed 27 July 2008

[32] Conroy, Senator the Hon Stephen (2008), OPEL Networks Funding Agreement not to proceed, Minister for Broadband Communications and the Digital Economy, http://www.minister.dbcde.gov.au/media/media_releases/2008/019, viewed 27 July 2008

[33] Sadlon, Michael (2008), Government Advises Termination of OPEL Contract, Futuris (Elders) http://clients.weblink.com.au/clients/Futuris/article.asp?id=3295594, viewed 27 July 2008

[34] DBCDE (2008), Telephone Services, http://www.dbcde.gov.au/communications_for_consumers/telephone_services/fixed_telephone_services/overview_of_fixed_telephone_services/connecting_the_telephone, viewed 27 July 2008

Telstra claims that the amount paid to them by the Government for maintaining the USO does not reflect the costs of the USO[35]. As a private company, Telstra should not be forced to put this cost on to existing customers or impact on its shareholders. However, Telstra must also have motivation to operate efficiently and not put undue cost onto Australian taxpayers.

Perhaps the USO could be split on a geographical basis or combined with the Australian Broadband Guarantee. In turn, USO could be tendered to different companies based on area. Risks would remain that financial incentives to provide decent services would be minimal. Methods of ensuring network standardisation, judging quality of service, reasonable maintenance and other measures would need to be developed.

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Questions

Could the USO be expanded or strengthened?
Would the cost to the Government be worth strengthening the USO?
Could the USO be split based on geographical area or other characteristics?
Could the USO be put out to competitive tender?

</div>

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Recommendations

That due consideration be given to expanding or strengthening the USO
That USO payments from the Government reflect the cost of efficient services

</div>

4.5   DIGITAL DATA SERVICE OBLIGATION

Telstra is bound by the Digital Data Service Obligation (DDSO) to provide, a data service with a 64 kilobit per second (kbit/s) digital data capability[36]. Through the general digital data service (GDDS) and special digital data service (SDDS), the DDSO provides faster than modem speed Internet at commercial prices, potentially with a discount. As this scheme does not specify particular technologies, this may be through standard commercial wireless or satellite services.

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Questions

Could the DDSO be expanded or strengthened?

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Recommendations

That due consideration be given to expanding or strengthening the DDSO

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[35] Now We Are Talking (2008), What's the score: Universal Service Obligation (USO), Telstra, http://www.nowwearetalking.com.au/features/whats-the-score-universal-service-obligation-uso viewed 27 July 2008
[36] ACMA (2008), Digital Data Service Obligation (DDSO) fact sheet, http://www.acma.gov.au/WEB/STANDARD/1001/pc=PC_1722, viewed 27 July 2008

5 INFRASTRUCTURE CHALLENGES

This chapter reviews the Broadband Internet challenges presented by Australia's telecommunications infrastructure.

5.1 EXCHANGES – ADSL PORTS

Telephone exchanges often lack ADSL ports to provide ADSL to residences. The most common cause of this problem is that no telecommunications company views it as viable to install more ports at an exchange site. Once an ADSL port is installed at an exchange, any telecommunications company can use it. However, ADSL2+ ports do not have to be shared with other telecommunications companies. This creates interesting corporate decision making.

5.2 EXCHANGES - CAPACITY

Telephone exchanges often lack ADSL ports to provide ADSL to residences. One of the reasons for this can be that an exchange lacks the physical capacity to install further ADSL ports. Significant costs may be involved in upgrading such exchanges to handle additional capacity.

5.3 EXCHANGES - COMPATIBILITY

Telephone exchanges often lack ADSL ports to provide ADSL to residences. Sometimes, this is due to an exchange not being ADSL compatible. As most exchanges are now ADSL compatible, this is usually only a problem with people seeking ADSL2+.

5.4 EXCHANGES - DISTANCE

ADSL can only be provided to locations within a limited range from a telephone exchange (or other central location). These are physical limitations that result from signal losses over the existing copper line infrastructure[37]. At no stage in the near future will replacing all of the existing copper lines to premises be an option.

ADSL can be provided in a range of up to 4.5 kilometres, though it can sometimes go as far as 8 kilometres. ADSL2+ can only be provided in a range of up to 1.5 kilometres, though it can go further. These problems can be reasonably overcome with Fibre to the Node (FTTN) and other solutions, at a cost.

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[37] Internode (2008), Move up to Internode Extreme® ADSL2+,
http://www.internode.on.net/residential/internet/home_adsl/extreme/, viewed 27 July 2008

5.5   LARGE FIBRE PAIR GAIN SYSTEMS – ADSL PORTS

There are three main forms of large fibre based pair gain systems in Telstra's existing infrastructure. These are the Remote Integrated Multiplexer (RIM), Customer Multiplexer[38] (CMUX) and Integrated Services Access Manager (ISAM). While CMUX and ISAM have components in exchanges, it is the road side cabinets, or nodes, that we refer to in this section. The RIM is redundant and ISAM is the latest technology. RIM, CMUX and ISAM cabinets can often be seen in newer developments.

Each of these units is a digital loop carrier (DLC), a system which uses digital transmission to extend the range of the local loop further than would be possible using only twisted pair copper wires. A DLC digitises and multiplexes the individual signals carried by the local loops to a single data stream on the DLC segment[39].

These units have a limited number of ADSL ports. Where these cabinets are at capacity, the cost involved in upgrading the cabinet to provide additional ADSL ports is usually viewed as uneconomical. This is a fairly common problem in Forde in newer areas where cabinets were not designed for the ADSL demand now being experienced.

Furthermore, Telstra's competitors can not currently install dslam units in these cabinets. This appears to be due to a combination of space[40] and technological compatibility issues. The ability of Telstra's competitors to install equipment in these cabinets may be a competition issue in the future.

Recommendations

While only Telstra can install ADSL ports in RIM's, that Telstra must rent out ADSL ports in RIM's to other telecommunications providers

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5.6   LARGE FIBRE PAIR GAIN SYSTEMS – CAPACITY

Large fibre pair gain systems often lack ADSL ports to provide ADSL to residences. One reason for this can be that a unit lacks the physical capacity to install further ADSL ports. This is more common for large fibre pair gain systems than exchanges, as these are relatively small units. Significant costs are involved in upgrading such systems to handle additional capacity.

5.7   LARGE FIBRE PAIR GAIN SYSTEMS - COMPATIBILITY

In cabinet form, RIM, CMUX and ISAM are all ADSL compatible but not ADSL2+ compatible. This renders customers that receive their telecommunications services through one of these units to be unable to access ADSL2+ technologies. This affects some of the newest areas of Forde, such as the Woodlands Estate at Waterford.

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[38] Whirlpool.net.au (2004), CMUX The Successor to RIM, http://whirlpool.net.au/wiki/?tag=CMUX_The%20Successor_to_RIM, viewed 27 July 2008
[39] Wikipedia (2008), Digital loop carrier, http://en.wikipedia.org/wiki/Digital_loop_carrier, viewed 27 July 2008
[40] Whirlpool.net.au (2008), Why not Agile mini FTTN?, http://forums.whirlpool.net.au/forum-replies.cfm?t=587301#r7, viewed 27 July 2008

Current RIM, CMUX and ISAM units could be considered as 'nodes' in the context of the Rudd Government FTTN network. The FTTN is to be ADSL2+ compatible, which would indicate replacement or upgrades of these units. However, nodes created by this network may be quite different to existing nodes. It would appear to us that older technology, such as RIM's, would be ripe for replacement in any FTTN network.

> ### Recommendations
>
> If RIM's are made ADSL2+ compatible, competitors must be able to install their own ADSL2+ ports or Telstra made to rent out RIM ADSL2+ ports to competitors

5.8   LARGE FIBRE PAIR GAIN SYSTEMS - DISTANCE

Large fibre pair gain systems face similar challenges to exchanges when it comes to distance. ADSL can only be provided to locations within a limited range of a large fibre pair gain system due to signal losses over the copper phone lines. In some unfortunate cases, distance is still counted as being from the exchange rather than from the large fibre pair gain system.

5.9   MEDIUM FIBRE PAIR GAIN SYSTEMS - COMPATIBILITY

The form of medium fibre based pair gain system that we have observed is the Small Capacity Distributed System (SCaDS). Up to 30 customers are supported per SCaDS[41], which appears to be mainly used in rural and remote areas. The SCaDS is ISDN compatible not ADSL or ADSL2+ compatible.

Because of the remote usage of the SCaDS, often the exchange that the SCaDS is connected to is also not ADSL compatible. We are not aware of plans to make SCaDS units ADSL compatible. It is difficult for us to determine if people on SCaDS units will be beneficiaries of the Rudd Government FTTN network. These units must be replaced in the medium to long term.

> ### Questions
>
> Will people on SCaDS units benefit from the Rudd Government FTTN network?

> ### Recommendations
>
> This infrastructure be replaced in the medium to long term

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[41] Whirlpool.net.au (2003), SCaDS question, http://forums.whirlpool.net.au/forum-replies-archive.cfm/81220.html, viewed 27 July 2008

5.10   SMALL COPPER PAIR GAIN SYSTEMS - COMPATIBILITY

A small number of older style copper pair gain systems are in existence. As opposed to the more modern technologies detailed previously, these systems mean that people share the same frequencies on the same physical copper lines rather than utilising different signal frequencies. These units are definitely not ADSL or ADSL2+ compatible.

Because of the remote usage of small copper pair gain systems, often the exchange that it is connected to is also not ADSL compatible. These units would need to be replaced to be ADSL compatible and probably have more lines installed from the connected exchange. It is difficult for us to determine if people on these units will be beneficiaries of the Rudd Government FTTN network. However, we suspect that people on these units may be part of the 2% of the population that may not receive FTTN. These units must still be replaced in the long term.

Questions

Will people on small copper pair gain systems benefit from the Rudd Government FTTN network?

Recommendations

This infrastructure be replaced in the long term

5.11   PAIR GAIN TECHNOLOGY

Pair gain is a technology that 'splits' a copper telephone line so as to allow for the provision of more than one telephone service per copper line[42]. RIMS, CMUX cabinets, ISAM cabinets, SCaDS and older pair gain units can all use a form of Pair Gain Technology.

Telstra mainly used this technology in newer areas during the 1980's and 1990's to provide additional phone services because it was cheap. For consumers, the result now is the inability to access ADSL and slower than 56kbps normal dial-up Internet access. This is a problem that affects a substantial number of Forde residents.

There is a history of disputes between the Australian Labor Party and Telstra over the use of Pair Gain Technology[43]. In her previous role as Shadow Minister for Information Technology, Senator Kate Lundy savaged Telstra for this practice[44]. As a result of Senator Lundy's campaign, Telstra vowed in 2002 to stop using the technology[45] but claimed that replacing pair gain would cost a

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[42] Setel (2008), Issue Paper: Pair gain and RIM problems hindering access to ADSL, http://www.setel.com.au/site.php?id=320, viewed 27 July 2008
[43] Lebihan, Rachel (2002), War of words erupts over Telstra service levels, pricing, ZDNet, http://www.zdnet.com.au/news/communications/soa/War-of-words-erupts-over-Telstra-service-levels-pricing/0,130061791,120264008,00.htm?feed=pt_cmux, viewed 27 July 2008
[44] Lundy, Kate (2002), Have you been sold a 'line' on broadband communications access?, The Age & Sydney Morning Herald 2 April 2002, http://www.katelundy.com.au/pairgarticle.htm, viewed 27 July 2008
[45] Warne, Dan (2002), Telstra to stop rolling out pair gain, Whirlpool.net.au, http://whirlpool.net.au/news/?id=989, viewed 27 July 2008

massive $2 billion[46]. Since this time, Telstra appears to be gradually removing Pair Gain Technology[47] but our experiences indicate that some newer connections have still used it.

On the 13th of May 2008, my office wrote to Senator the Hon Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, in relation to concerns about the use of Pair Gain Technology. The Minister's reply, received on the 10th of July 2008, noted that decisions in this area are "primarily a business decision for internet service providers."

Recommendations
Pair Gain Technology to be phased out by a set date

[46] Pearce, James (2003), AU$2 billion to replace pair gain unnecessary: Telstra, ZDNet
http://www.zdnet.com.au/news/communications/soa/AU-2-billion-to-replace-pair-gain-unnecessary-
Telstra/0,130061791,120274861,00.htm?feed=pt_telstra, viewed 27 July 2008
[47] AMCA (2008), Pair Gain Systems, http://www.acma.gov.au/WEB/STANDARD/1001/pc=PC_1963, viewed 27 July 2008

6   POLITICAL CHALLENGES

This chapter reviews high level political challenges faced by politicians and governments by Broadband Internet.

6.1   PRIVATE INFRASTRUCTURE OWNERSHIP

No summary of the situation of Broadband Internet would be complete without noting 'the elephant in the room' that is private telecommunications infrastructure. The public telecommunications infrastructure of Australia was privatised along with Telstra. While removing some problems, such as concerns about public service efficiency, this structural change has created a raft of other problems.

Having a genuinely competitive telecommunications system is difficult under these circumstances. Telstra is the dominant telecommunications industry player, having the largest customer base and the power that comes from owning most of Australia's telecommunications infrastructure. Telstra's interests are not necessarily the same interests as those of the people of Australia.

Telstra was privatised in 3 different stages, informally known as T1, T2 and T3 in 1997, 1999 and 2006. In T1, the government sold one third of its shares in Telstra for $14 billion. In 1999 a further 16% of Telstra shares were released to the public and sold, leaving the Government with 51% ownership. In 2006, T3 was announced by the government and was the largest of the three public releases, reducing the Government's share in Telstra to 17%[48]. Nevertheless, Telstra is effectively a private enterprise, with Government unable to force actions that may harm other shareholders.

The overall question of the appropriateness of private infrastructure ownership cannot be avoided.

Questions
Is the broad system of private infrastructure in the best interests of Australia?

Recommendations
That future public ownership of infrastructure, or components of the infrastructure, not be ruled out

6.2   PUBLIC VERSUS PRIVATE FUNDING

The line between private and public funding in Broadband Internet services is blurred. This is to the advantage of private businesses in this area, which, despite being the owners and operators of telecommunications in Australia, can and do at times deflect their responsibilities to the Federal Government.

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[48] Wikipedia (2008), Telstra, http://en.wikipedia.org/wiki/Telstra, viewed 27 July 2008

Where this may be an issue is in politically hot areas. For example, with people demanding ADSL Broadband and a Government willing to pay for it, why would a private company invest in their own ADSL equipment? When Government dollars area available, telecommunications companies inevitably hold back investment.

Assuming that private infrastructure is here to stay, the main option must be to enable as much infrastructure access and investment as possible. Telecommunications businesses must be able to install their own equipment that connects with the existing infrastructure. These businesses must also have the information and knowledge to easily access, build and maintain Australia's telecommunications infrastructure.

Questions

Do private companies have a motivation to invest in politically hot areas?

Recommendations

Genuine competition in telecommunications is necessary if privatisation is to work

6.3 EXTERNALITIES

The provision of telecommunications services has problems resulting from externalities. When a telecommunications company makes a decision on an investment, they will evaluate the potential profit from that investment. Yet telecommunications investments have significant externalities in the form of benefits to third party stakeholders.

One known externality is the effect on the Australian economy as a whole, which is generally viewed to benefit from Broadband Internet investment. Back in 2001, Accenture estimated benefits of $12 billion to $30 billion per annum from investment in the next generation of Broadband[49]. Labor's 2007 FTTN network election commitment in turn claimed 'up to $30 billion in additional national economic activity a year'[50].

Private infrastructure ownership does not recognise externalities. This systematic weakness ensures that government will be spending public money in this area for the foreseeable future.

Questions

Can externalities be factored into a private telecommunications market?

Recommendations

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[49] Department of Communications, Information Technology and the Arts (2008), Chapter 1 – Why is Broadband Important?, http://archive.dcita.gov.au/2007/12/bag_report/chap1, viewed 4 August 2008
[50] Australian Labor Party (2007), Building Australia's Prosperity - Federal Labor's New National Broadband Network, http://www.alp.org.au/media/0307/mscomfinloo210.php, viewed 4 August 2008

6.4   COMMERCIAL INTERESTS

Every player in the telecommunications industry is functioning as a private enterprise. The arguments presented by these companies are reflections of the commercial interests of those companies. For this reason, caution must be applied to the approaches of all companies on this subject, so as to act in the genuine best interests of the people of Australia.

The commercial interests of telecommunications industry players vary significantly. Telstra's Broadband market power means that competitors face a lack of economies of scale and necessary knowledge to establish independent infrastructure. Telstra's interests are therefore in blocking access to their infrastructure or charging it out just below the cost of duplicating infrastructure, while groups like iiNet, Optus, Dodo, Virgin and iPrimus have interests in open access to Telstra infrastructure.

A couple of years ago, Telstra established a lobbying campaign and website called "Now We Are Talking"[51]. Without passing judgement on specific Telstra arguments, this campaign is about their commercial interests. This Internet site is targeted at the public to put pressure on Governments to support Telstra's commercial interests.

Using the public as a pawn for commercial interests, a behaviour not limited to Telstra, is a worrying strategy. There is clearly a public battle between Telstra and their competitors for the 'hearts and minds' of the Australian people.

Questions

How should private enterprise campaigns against the Government be handled?

Recommendations

That caution be applied to arguments from companies seeking financial benefit

6.5   ACCESS TO NETWORKS

Telecommunications companies building and operating separate infrastructure is not necessarily efficient. This duplication is particularly apparent in wireless and mobile phone networks. In effect, infrastructure is being unnecessarily duplicated, with the additional cost passed on to the consumer. Furthermore, as highlighted by the Optus Queensland outage on the 15th of July 2008, there is also a concerning low level of redundancy in our telecommunications system.

Questions

Could better sharing of infrastructure improve efficiency of services?

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[51] Now We Are Talking (2008), Telstra, http://www.nowwearetalking.com.au/, viewed 27 July 2008

6.6 ANTI-COMPETITIVE INFRASTRUCTURE DECISIONS

The potential exists for infrastructure decisions to be made in such a way as to shut out competitors. This may have already occurred and it a likely consequence of business manoeuvring in telecommunications involving physical infrastructure. This is an area that may need further Government intervention and regulation.

For example, consider the street cabinet RIM, CMUX and ISAM owned by Telstra. Access to these units is limited, due to issues such as space. However, should these style of units in the future be designed in such a way as to not leave enough space for competitors to install equipment, this could be an effective anti-competitive option. This would leave competitors, with less economies of scale, faced with having to duplicate infrastructure. While we have no evidence that this behaviour is occurring at this stage, it is worth noting the possibility of this occurring in the future.

Through funding of the Australian Broadband Network, the Federal Government may be able to enforce that publicly funded infrastructure is built to ensure competitive market conditions. For example, new roadside cabinets could be forced to have some redundancy and be designed in a way that all telecommunications players can utilise the equipment.

6.7 SHORT TERM INFRASTRUCTURE DECISIONS

The economic drivers faced by telecommunications companies may be resulting in decisions that are expensive in the long term. That is, decisions are being made on short term financial interests that may cause significant cost down the line to the company and their customers.

For example, consider the fitting of RIM systems in newer estates in Forde such as Flagstone. As these estates grew, the capacity of the RIM's was strained and more phone lines were split using Pair Gain Technology. This created the strange situation where people were moving into brand new estates like Flagstone and Ormeau and were unable to access ADSL Internet. If the job had been done properly in the first place, this could have been a lot less costly for the Government which now supplies residents in these situations with subsidised wireless or satellite Broadband.

This matter has consequences for the National Broadband Network. The 'nodes' being created in the FTTN network will need to have capacity for the future in developing outer suburban areas. If there is not flexibility to accommodate future growth, newer areas could be rendered with second rate Broadband services. In other words, the exact problem we have now, with newer areas having the mediocre services, could be replicated in the future.

One possible solution for this may be for councils to require developers to factor in Broadband Internet access as part of their development approvals. For better or for worse, this may shift the Broadband Internet cost from telecommunications companies onto developers. Another solution may be to force telecommunications providers to provide excess capacity for planned developments.

Questions
How can telecommunications companies be encouraged to think long term?

Recommendations
The National Broadband Network be used to thwart short term infrastructure decisions

6.8   ADSL PORTS

Telecommunications companies are forced to resell their installed ports to their competitors at a regulated price. Telstra claims that these prices are too low, resulting in it not being commercially attractive for them to install any more ADSL ports.

Questions
Are resale prices for ADSL ports reasonable?

Recommendations
N/A

6.9   ADSL2+ PORTS

The arrangements with ADSL2+ ports are significantly different to that of normal ADSL ports. To our understanding, ADSL2+ ports are software upgrades of existing ADSL ports.

Telstra had a large number of exchanges read to switch on ADSL2+ but held back as part of their desire to influence the Howard Government and the Rudd Government. Telstra wanted assurances that they would not have to resell these ports to competitors. The Rudd Government assured that "it did not consider a compelling case had been made for regulating third party access." As a result, Telstra switched on ADSL2+ in February 2008[52].

In June 2008, Telstra began considering reselling their ADSL2+ ports to competitors[53]. Telstra began wholesale selling ADSL2+ ports[54]. Inevitably, Telstra would set the price at a touch below the cost to their competitors of installing their own ADSL2+ ports in Telstra exchanges. Telstra's market share and resulting economies of scale should ensure that they make profits from this arrangement, assuming minimal Government intervention.

Questions

Should ADSL2+ ports be forced to be sold to competitors?

Recommendations

Review of current wholesale approach to ADSL2+ ports

6.10   ACCESS TO EXCHANGES

There is a political dispute between Telstra and its competitors over access to exchanges for the installation of ADSL equipment[55]. Telstra is allegedly taking a long time to process complaints and often refusing access on the grounds of limited space. The ACCC appears to see some legitimacy in the complaints by placing additional rules on Telstra, forcing them to provide reasons for denying competitors access to exchanges[56]. Perhaps an independent authority could be brought in to make a call on disputes in this area.

Questions

Are Telstra providing reasonable exchange access to their competitors?

Recommendations

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52 Best, Jo (2008), Telstra 'loses game of chicken' on ADSL2+ rollout, ZDNet,
http://www.zdnet.com.au/news/communications/soa/Telstra-loses-game-of-chicken-on-ADSL2-rollout/0,130061791,339285693,00.htm , viewed 27 July 2008
53 Bingemann, Mitchell (2008), Telstra considers reselling ADSL2+ to rival ISPs, ITNews,
http://www.itnews.com.au/News/78170,telstra-considers-reselling-adsl2-to-rival-isps.aspx, viewed 4 August 2008
54 Colley, Andrew (2008), Telstra Lifts Gates on ADSL2+, http://www.australianit.news.com.au/story/0,24897,24147452-15306,00.html, viewed 15 August 2008
55 Sweeney, Phil (2008), ACCC to monitor Telstra Exchange Access, Whirlpool.net.au,
http://whirlpool.net.au/news/?id=1801&show=replies, viewed 27 July 2008
56 Pauli, Darren (2008), ISPs squabble over cheap DSL access: Telstra, CIO/Computerworld,
http://www.cio.com.au/index.php/id;1753726337, viewed 27 July 2008

Ensure that Telstra's competitors have fair access to Telstra infrastructure
Independent authority to review situations at contentious Telstra exchanges

6.11   PUBLIC EXPECTATIONS

One of the challenges from a political point of view is public expectations. This is difficult because the demands on Government are complex and sometimes contradictory, seeking the advantages of a public service along with the advantages of a private enterprise. For example, enquiries have sought from the Government:

- Intervention in infrastructure decisions made by private enterprise;
- Private enterprise products to be supplied in areas where they are not available; and
- More competition in Broadband Internet products in their local area.

The old public system approach presented little choice but relatively universal services. The private system approach we have now presents private choices with relatively patchy services. The system we have now is merely a reflection of private sector financial motivations, but people expect the benefits of both models.

A reflection on this situation is that many people have a misplaced trust in telecommunications companies. For example, whereas a person may expect a bank not to inform them of worthwhile alternative products from competitors, they may be surprised when a telecommunications company fails to note alternative products. Perhaps we are witnessing a lag in understanding as some people still perceive telecommunications as a public service when it is in fact a private enterprise.

Ideally, the Federal Government could empower the general public by providing information about Australia's telecommunications arrangements. This could allow people to more informed and productive input into the big decisions in these areas. It could also allow people to better recognise where their interests lie, which may differ from that of business lobby groups and or Government.

Questions
Are telecommunications arrangements in Australia broadly understood?

Recommendations
Inform people of telecommunications arrangements in Australia

7   GLOSSARY & DEFINITIONS

Term	Definition
ACCC	Australian Competition and Consumer Commission
ACMA	Australian Communications and Media Authority www.acma.gov.au .
b	Bit
B	Byte. 8b.
BPL	Broadband over power lines.
CMUX	Customer Multiplexer, small cabinet used to supply telecommunications services in a local area.
DLC	Digital Loop Carrier.
DSLAM	A Digital Subscriber Line Access Multiplexer (DSLAM, often pronounced dee-slam) allows telephone lines to make faster connections to the Internet[57].
FTTN	Fibre to the node
FTTP	Fibre to the premises
GB	Gigabyte. 1024MB.
ISP	Internet Service Provider (eg. Telstra, Optus, iiNet)
kB	Kilobyte. 1024B.
kbps	Kilobits per second. A measure of Internet speed.
MB	Megabyte. 1024kB.
Mbps	Megabits per second. 1024kbps. A measure of Internet speed.
RIM	Remote Integrated Multiplexer, small cabinet used to supply telecommunications services in a local area. Obsolete.
SCaDS	Small Capacity Distributed System
TIO	Telecommunications Industry Ombudsman

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[57] Wikipedia (2008), Digital subscriber line access multiplexer, http://en.wikipedia.org/wiki/Dslam, viewed 27 July 2008