

○ MOVING THE DEBATE FROM OPEN ACCESS TO NETWORK NEUTRALITY

US LESSONS FOR AUSTRALIA

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Against the backdrop of the Rudd government's 2007 election promise for a national wholesale broadband network to be operated under open access principles, this paper explores how the debate in the United States of America for 'open access' fell by the wayside by 2002/03 and was replaced by strident calls for 'network neutrality'. It analyses why this change of emphasis arose and how the opposing sides in the debate have taken network neutrality to mean whatever supports their case. The paper discusses possible lessons impacting on the evolving debate in Australia over the most appropriate regulatory regime underpinning the government's 2009 vision for this national wholesale broadband network to now be state-controlled.

INTRODUCTION

Notwithstanding the different regulatory regimes applied over time to the telecommunication, cable television and Internet service industries in the US, technological developments have provided the main opportunity for adopting service differentiation that has been justified on commercial grounds. Nevertheless, such service differentiation has been regarded by some parties as being discriminatory.

Concern by US consumers, service providers and academics over the adverse consequences of restrictions on access first arose in the 1980s when 'closed' online services such as CompuServe, Prodigy and America Online prospered by selling subscribers dial-up access to 'walled gardens' involving proprietary content and the ability to exchange e-mails only with other subscribers to the same service. (Nuechterlein and Weiser 2005, 155 & 555) (Lessig 2001, 162–163)

The debate over the rights, wrongs and mechanics of 'opening' access to broadband peaked during the period 1999–2002, leading to polarised positions adopted by immediate stakeholders – regulators, cable television companies, telephone companies, Internet service providers or ISPs, and lobby groups – some being related to the former. Emotive language prevailed, ranging from claims of 'forced access' and 'infrastructure socialism' (Thierer and Crews 2003) to predictions of the end of the 'end-to-end' architecture of the Internet. (Lemley and Lessig 2001)

OPENING ACCESS TO US CABLE SYSTEMS

During the 1990s, once cable television systems developed the ability to also offer cable modem access to the Internet, the operators soon realised they could commercially benefit by channelling this access through ISPs with which they were affiliated. Pressure soon grew for such cable systems to provide 'open access' to unaffiliated ISPs, in like manner to what had been the norm for carriers regarding dial-up and DSL Internet access.

Cable television systems in the US had been largely unregulated and by that time gained some 70 per cent of the market share in residential broadband services (Bittlingmayer and Hazlett 2002, 295–296) (Thierer and Crews 2003, 66–67). Speta (2000, 975) attributed this success to

cable not being subject to the unbundling rules of common carrier telecommunication companies or 'telcos' whose wires were required to transport DSL services of other service providers.

Cable operators usually provided Internet access through wholly or partially owned affiliated or ISPs. The demands of unaffiliated ISPs to access this same broadband infrastructure in a non-discriminatory manner created the push for 'open access'. A number of municipal franchise decisions and industry mergers were instrumental in triggering the debate, which fuelled legal challenges and regulatory action in the United States, as well as Europe. The prime mergers were that of AT&T with MediaOne/TCI and then AOL with Time Warner. (Aufderheide 2002) (Rosenthal 2001) (Speta 2000)

Consummated and approved during 2000/01, the AOL-Time Warner merger remains the most significant focus for open access considerations in the USA. The case has been extensively analysed by various writers with emphasis on factors such as: possible incentives for conduit or content discrimination (Rubinfeld and Singer 2001); definitional classification by the FCC under the Telecommunications Act of 1996 (Rosenthal 2001); competition effects relating to instant messaging (Faulhaber 2004) and interactive television (Galperin and Bar 2001); and the impact of a commons strategy as a future regulatory approach (Aufderheide 2002).

In approving the merger, the Federal Trade Commission decreed that AOL Time Warner: (FTC 2000)

- Must make its cable system available to competing (non-affiliated) broadband Internet service providers;
- Be prohibited from interfering with content passed along the bandwidth contracted for by unaffiliated ISPs and from interfering with the ability of unaffiliated entities to interact with interactive signals, triggers or content;
- Be required to market and promote its DSL services to subscribers in the Time Warner cable areas where AOL cable broadband ISP service or Road Runner is available at the same or comparable level and in the same or comparable manner as it markets and promotes DSL services to subscribers in areas in which neither AOL cable broadband ISP service nor Road Runner is available.

The FCC then added more stringent conditions requiring AOL Time Warner: (FCC 2001)

- To allow unaffiliated ISPs to have an unimpeded 'first-screen' relationship with their subscribers, to have a direct billing relationship with subscribers, to benefit equally in technical features such as quality of service mechanisms and caching, and to be afforded fair carriage contracts;
- To open their 'advanced' instant messaging network to one competitor immediately and to two others within 180 days thereafter;
- To avoid any agreement with AT&T that would make AOL Time Warner the exclusive ISP on AT&T's high-speed cable-modem platform.

The above or similar requirements applied to no other American cable television companies who, not surprisingly, were united in their opposition to such changes being more widely applied

– particularly as it would imply wholesale rate regulation and devolution into common carrier status. (Bittlingmayer and Hazlett 2002: 297)

Proponents of broadband open access on US cable systems particularly focussed on the different regulatory regimes traditionally imposed on telephone and cable television. “There is no justification in law or policy for giving cable companies special treatment”, claimed Lemley and Lessig (2001: 2). Their central argument was as follows: if cable companies are allowed to dictate a consumer's choice of an ISP, and therefore eliminate competition among ISPs in the broadband market, prices will increase and innovation will be harmed. In particular, allowing bundling will compromise an important architectural principle that has governed the Internet since its inception – the principle of 'end-to-end' design.

First adopted for technical reasons as a part of systems design (Saltzer, Reed et al. 1981), the 'end-to-end' design philosophy places 'intelligence' in a network at its ends, where users put information and applications onto the network, with the intervening communications protocols (the 'pipes' through which information flows) being as simple and as general as possible. (Lemley and Lessig 2001: 4) The authors maintain that with such design “the Internet has enabled an extraordinary creativity precisely because it has pushed creativity to the ends of the network”. Legacy monopolies with bottleneck control over broadband pipes will improperly affect the architecture of the Internet for their own benefit. (Lemley and Lessig 2001: 3 & 13)

This was rebutted by Hazlett and Bittlingmayer who contended that “as a goal, 'end-to-end' provides guidance but no answers”. Rules that retard infrastructure investment or service penetration would restrict functionality and harm consumers, they said. (Hazlett and Bittlingmayer 2001: 56–61)

RESTRICTING ACCESS BY US TELCOS

During the 1990s, US telecommunication carriers had also begun to deploy DSL technology that enabled access to the Internet at much higher speed than possible by dial-up means. With the subsequent development of VoIP technology, unaffiliated service providers began to exploit the opportunity to deliver telephony over such Internet-capable lines and thereby pose a commercial threat to the main business of the carriers.

As a result, network operators saw reason to impose certain restrictions on customer usage such as limits on up-stream traffic, limits on third-party applications, prohibitions on setting up servers and prohibitions on connection to a corporate LAN from home. Some operators offered their customers faster service to affiliated Internet content providers.

According to Bar, Cohen et al. (2000: 4.2), such strategies could 'systematically shape what content and services gets to the end-users', shaping 'the very terms of innovation on the internet, deciding who gets to experiment and who can capture the resulting benefits'. Critics even claimed that asymmetric bandwidth directly discriminated against user-originated content.

When SBC Telecommunications CEO Edward Whitacre was asked in October 2005 whether he was concerned about the plans of 'Internet upstarts' Google, MSN, Vonage and others to further expand their services that critically depended on broadband networks for accessing customers, he responded with a surprisingly frank admission:¹

How do you think they're going to get to customers? Through a broadband pipe. Cable companies have them. We have them. Now what they would like

to do is use my pipes free, but I ain't going to let them do that because we have spent this capital and we have to have a return on it. So there's going to have to be some mechanism for these people who use these pipes to pay for the portion they're using. Why should they be allowed to use my pipes?

The Internet can't be free in that sense, because we and the cable companies have made an investment and for a Google or Yahoo! or Vonage or anybody to expect to use these pipes [for] free is nuts!

Although few in number, the above allegations of discriminatory practices fuelled a debate that Internet-based network operators should be required to be neutral as regards the treatment of third party service providers and their applications. This debate became particularly heated in 2005/06 and maintained momentum throughout the 2008 US presidential election.

NEUTRALITY PRINCIPLES

The public debate in the US has almost always been framed as being about 'network neutrality' or 'net neutrality' and rarely about 'Internet neutrality', whereas in reality the terms 'network' and 'net' are shorthand for the Internet rather than networks delivering cable television. Although the latter are private networks and operated as such, the Internet remains a global network accessible by the public at large despite being accessed via predominantly private networks that connect with end-users. Lessig (2005) feared that Internet access could become like cable television and fervently spoke for the need to change public policy to prevent this happening.

For a decade, Stanford Law School professor Lawrence Lessig had studied the relationship between the architectural design of the Internet and innovation. (Lessig 2001: Ch.3) He argued that the explosive growth of the Internet is a direct result of its innovation-promoting design based on the 'end-to-end' principle. (Saltzer, Reed et al. 1981) In his testimony to a US Senate hearing, Lessig declared that “if this Committee wants to preserve that growth and innovation, it should take steps to protect this fundamental design” by incorporating certain principles of Internet neutrality into the telecommunications law guiding FCC policy. (Lessig 2006, p.1)

After surveying a plethora of suggestions made over a number of years as to what neutrality should embody, Lessig threw his support behind ex-FCC Chairman Michael Powell's statement of the Internet's four 'Internet Freedoms' provided it was augmented by one additional requirement arising from the work of Timothy Wu. If implemented, this total package would protect consumers from the adverse effects of certain kinds of discriminatory practices.

According to Powell, “usage and deployment of high-speed Internet depends on access to content” and “network owners, ISPs, equipment makers, and content and application developers *all* benefit when consumers are empowered to get and do what they wish”. (Powell 2004) In his view, “it is time to give the private sector a clearer roadmap by which it can avoid future regulation on this issue by embracing unparalleled openness and consumer choice”. Powell issued a challenge to the broadband network industry to preserve the following 'Internet freedoms', subject to the legitimate needs of operators to manage their networks and not being exposed to theft of service:

- Freedom to Access Content – consumers should be allowed to reach the legal content of their choice;

- Freedom to Use Applications – consumers should be able to run applications of their choice;
- Freedom to Attach Personal Devices – consumers should be permitted to attach personal devices they choose to the connections they pay for in their homes;
- Freedom to Obtain Service Plan Information – consumers must receive clear and meaningful information regarding their service plans and plan limitations.

Preserving 'Internet Freedom' in this manner would “serve as an insurance policy against the potential rise of abusive market power by vertically integrated providers” and promote innovation “by giving developers and service providers confidence to develop applications that will reach consumers and run as designed”.² (Powell 2004)

However Lessig considered Powell's principles to be missing one important requirement – network providers would still be able to impose restrictions on whichever application and content providers they desired, in the form of charges unrelated to the bandwidth used by those providers. (Lessig 2006) Describing this as 'access tiering', Lessig distinguished such discrimination from that of 'consumer tiering' which he reckoned should be encouraged as consumers would merely be paying for different levels of service. In other words, any tiering of a service package should be neutral – for example, consumers could be offered a connection of higher speed or quality for a particular service but not if that service was only from a particular content provider.

This distinction proximated with Wu's proposed anti-discrimination principle, namely, “to forbid broadband operators, absent a showing of harm, from restricting what users do with their Internet connection, while giving the operator general freedom to manage bandwidth consumption and other matters of local concern”. (Wu 2003: Pt. IV) Service restrictions imposed by the local network would be allowable whilst those of an inter-network nature would be ultimately forbidden.

With Internet-based applications in a battle for the attention and interest of end-users, it was considered critical for the delivery platform to be neutral so that competition remains meritocratic and is not stifled by the self-interest of network operators.

ISSUES IN CONTENTION

If the opposite of a neutral network is one offering services in some form of discriminatory manner, what then are the arguments for and against neutrality or for and against discrimination? The main issues in contention from the US perspective are discussed here in the hope that they may offer an insight into the possible application of new models for regulating next generation broadband networks in a country such as Australia where the competitive and regulatory environment is different. The issues of diversity/differentiation, investment incentive, last-mile competition and vertical integration are closely interrelated.

DIVERSITY OR DIFFERENTIATION

Variously described as the principle of network diversity, network differentiation or product differentiation, the economic argument is that different groups of end-users or consumers may derive utility (that is, value) from differentiated goods that are closer to their ideal preferences. (Yoo 2005: Pt. III) (Yoo 2006) Such differentiation could be exploited by a new entrant competitor who, particularly if competing on non-price as well as price dimensions, could theoretically

generate sufficient revenue to cover its upfront costs despite having a turnover much smaller than that of the incumbent operator. Differentiation could occur through adopting a non-standard routing and control protocol, that is to say, other than TCP/IP, or by entering into exclusivity arrangements with respect to content. (Yoo 2005: Pt. III) Both these practices run counter to the principle of network neutrality.

A neutral network would have the intent or effect of commoditising broadband transmission and Internet services, resulting in firms only being able to compete on price. In instances where the market is determined by a network with large fixed/sunk costs and low marginal costs, such as that of a local broadband network and most particularly optical fibre in the access network, price-only competition exacerbates the tendency towards industry monopolies. (Ford, Koutsky et al. 2006) By giving firms alternate avenues of rivalry, differentiation allows for entry and gives consumers the benefits of not only price competition but also increased choice and innovation.

The counter argument is that these economic models fail to address the substantial loss in consumer welfare likely to occur should telephone and cable companies become gatekeepers and discriminate against Internet services, content, and applications considered to be inconsistent with the gatekeepers' revenue generation plans. (Roycroft 2006b) The following existing differentiation in services would be lost: (Roycroft 2006c)

For example, consumers typically receive e-mail services from their ISP. However, numerous other e-mail providers offer services, some for free and some for a charge, which allows the consumer to select the e-mail offering which best suits their needs. Similarly, consumers are presented with differentiation among e-commerce providers, which allows consumers to benefit from market leaders, such as Amazon.com, and niche market providers who may offer specialty services better suited to the needs of some customers.

Arguing that network neutrality and differentiated last-mile networks are not incompatible, Roycroft (2006c) noted that the cable modem and DSL networks dominating the market for last-mile broadband are inherently different technologies and consumers can take advantage of these differences by way of plans involving different download and upload speeds. Yoo's suggestion of enhancing network diversity by dispensing with current Internet protocol standards was dismissed as a recipe for reducing consumer benefits, increasing purchase risks and decreasing network effects. (Roycroft 2006a, p. 22–23) The standardisation associated with the Internet operates at the logical network layers below the 'application level' which is the platform supporting the wide variety of content, applications and services enjoyed by consumers.

INVESTMENT INCENTIVE

According to Thierer (2004a, p. 17), network neutrality proposals would discourage investment and innovation in broadband networks and services. He argued that if policymakers grant the broader 'commons' of Internet users more say about how networks operate, they would send a powerful signal to infrastructure operators and potential future operators of high-speed networks: "your networks are yours in name only and the larger community of Internet users – through the FCC or other regulatory bodies – will be free to set the parameters of how your infrastructure

will be used in the future". Why would a current or potential operator who hears that message ever want to invest risk capital in such a sector, Thierer asked?

Yoo (2005) further developed the case for incentives, arguing that whilst entry by new last-mile providers is ongoing and other last-mile broadband technologies are pending then it would be unwise to impede investment. With the potential for short-run supracompetitive returns being the primary mechanism upon which markets relied to stimulate entry, a reduced incentive to invest could cement any existing last-mile oligopoly into place and reinforce the likelihood of market failure.

Network neutrality proponents, also supporters of the end-to-end design philosophy as being central to the success of the Internet, argue that innovation derives from the 'edge' of the network rather than inside the network. From this perspective, network neutrality should promote, not retard, broadband deployment for two reasons: (Windhausen 2006)

- If the consumer can reach any Web site, use any equipment and access any service he or she wants, then the value of the connection is more valuable than if the consumer can only reach the services and use the equipment that the network owner chooses;
- Innovators of applications and services delivered over the Internet as well as devices that attach to end-user terminals will gain confidence that, once developed, access to the network and hence to consumers will be guaranteed.

Increased consumer demand for broadband networks and services would motivate network operators to build or enhance network infrastructure and entrepreneurs would be more willing to invest to develop new services and devices. Adopting a line of argument that could also be used by the anti-network neutrality camp, Lessig and Wu (2003, p.8) highlighted the need for regulatory certainty to stimulate new investment:

The question an innovator, or venture capitalist, asks when deciding whether to develop some new Internet application is not just whether discrimination is occurring today, but whether restrictions might be imposed when the innovation is deployed. If the innovation is likely to excite an incentive to discrimination, and such discrimination could occur, then the mere potential imposes a burden on innovation today whether or not there is discrimination now. The possibility of discrimination in the future dampens the incentives to invest today.

Crawford (2007) suggested that emotional arguments are at play – US telephone companies are beginning to use the figure of the 'romantic' or 'heroic builder' in their debate with government and the public, in that their vision of rolling out optical fibre to homes throughout the nation can only be realised if they gain an incentive to build.

Conceding that it remained an open question as to whether network neutrality regulation would reduce incentives to deploy network infrastructure below the necessary level, van Schewick (2005, p.39) considered that network neutrality regulation would not forbid network providers from vertically integrating into complementary markets as it only bans them from using discrimination to increase their sales at the expense of rivals. It would also not prevent them from making profit in the market for Internet services. The remaining profit could still be sufficient to motivate them to deploy the necessary infrastructure.

But what if there really was justification for infrastructure providers to receive an incentive to increase network capacity, to relieve congestion for example? Frischmann (2005, p.1021) suggested some viable options such as direct subsidisation of infrastructure expansion; tax incentives; co-operative research and development projects; and joint ventures.

LAST-MILE COMPETITION

THE YOO VIEW

Being perhaps the main academic author in favour of network diversity and against network neutrality, Christopher Yoo examined the possible relationship with last-mile competition in the US. Perhaps his overall position is best summarised by the observation that 'network neutrality focuses on the wrong policy problem' which should be to address any deficiency with last-mile competition. His various statements are summarized as follows:

NETWORK NEUTRALITY WILL NOT AFFECT THE CURRENT MAKEUP OF LAST-MILE COMPETITION

“The economic relationship between last-mile providers and end-users is largely determined by the fact that most end-users currently only have two options in terms of last-mile providers: the cable company and the telephone company. Mandated network neutrality would not change the makeup of this market”. (Yoo 2005, p.72)

NETWORK NEUTRALITY SHOULD INSTEAD FOCUS ON LAST-MILE COMPETITION

“In the broadband industry, the level of production that is the most concentrated and protected by barriers to entry is the 'last mile'.” “In directing their efforts towards promoting competition in applications and content, network neutrality focuses on the wrong policy problem”. (Yoo 2006, p.3)

LAST-MILE COMPETITION IS ALREADY ADEQUATE (IN THE US)

“Measured against any of these standards, the overall broadband market is sufficiently competitive to protect against anti-competitive harms”. (Yoo 2005, p.60)

IMPROVING LAST-MILE COMPETITION WILL OVERCOME CONCERNS ABOUT NEUTRALITY

“If 2–3 wireless broadband or broadband over powerline providers emerge so that consumers have 4–5 last-mile broadband options (including cable modem and DSL), there would be little danger in allowing one of those networks to experiment with exclusivity arrangements”. (Yoo and Wu 2006, p.3)

“Once a sufficient number of alternative last-mile providers exist, the danger of anti-competitive effects disappears, as any attempt to use an exclusivity arrangement to harm competition will simply induce consumers to obtain their services from another last-mile provider”. (Yoo 2004, p.35)

NETWORK DIVERSITY COULD FACILITATE THREE DIFFERENT LAST-MILE NETWORKS TO CO-EXIST

These would be “one optimized for traditional Internet applications such as e-mail and website access, another incorporating security features to facilitate e-commerce and to guard against viruses and other hostile aspects of Internet life, and a third that prioritizes packets in the manner

needed to facilitate time-sensitive applications such as streaming media and VoIP”. (Yoo 2005, p.31)

A CONTRA VIEW

In contrast, advocates for network neutrality have been resigned to the inadequacy of last-mile competition and its inability to protect against discriminatory practices affecting Internet services and applications, as depicted by the following views:

LAST-MILE COMPETITION IS INADEQUATE NOW AND UNLIKELY TO IMPROVE

“Chris (Yoo) believes that, at least when it comes to information networks, technology is changing the conditions for market entry in physical networking. He points to fiber optics and the potential use of wireless spectrum as examples. He believes that over the next decade we're likely to see vigorous competition among new entrants and old, like in any other 'regular' market”. “At the risk of sounding like a dinosaur, I am skeptical. I'd be willing to bet Chris that over the next decade the infrastructure market will continue to heavily favor the main incumbents”. (Yoo and Wu 2006, p.4)

EVEN ADEQUATE LAST-MILE COMPETITION WON'T OVERCOME CONCERNS ABOUT NEUTRALITY

“A network provider may have the ability and incentive to exclude rival content, applications or portals from its network, even if it faces competition in the market for Internet services. Apart from increasing the number of cases in which unaffiliated providers of complementary products face a real threat of discrimination, this result also implies that neither facilities-based competition nor open access regulation are the appropriate tools to mitigate this threat”. (van Schewick 2005, p.26)

YOO'S THREE NETWORK PROPOSAL WOULD BE COUNTER-PRODUCTIVE

“The three separate networks described by Professor Yoo, according to his vision of network diversity, are not delivered over shared facilities ... not only must separate last-mile broadband networks be built, but they will be built to provide unintegrated (and therefore lower value) network services”. “The existence of 'separate but optimized' data networks undermines the investment incentives which are critical to the network diversity argument”. (Roycroft 2006a, p.17)

Nevertheless, Wu proffered three 'classic' solutions to any need to encourage the deployment of last-mile broadband infrastructure: (Yoo and Wu 2006, p.3)

- The government spends money and builds the infrastructure itself, in like manner as it does for roads;
- The government subsidises build outs, one way or another; or
- Do nothing, presuming that the market will 'now and then get around the infrastructure economics problem'.

VERTICAL INTEGRATION

Demands for networks to be neutral are a consequence of the manner in which networks are or could be operated and in general these tend to be vertically integrated businesses. The concern

is that owners of the physical layer will use their control over the logical layer to give preferential treatment to selected applications and content. (Yoo 2006, p.11) The intent of network neutrality is to regulate the physical layer to preserve competition in the applications and content layers.

Yoo (2006, p.14) recounted that, according to Chicago School theory and providing the barriers to entry in a particular market segment are low, vertical integration does not pose as much of a threat as previously thought. In fact, it can yield significant consumer benefits. Even in a broadband industry characterised by a duopoly structure, Thierer (2004b, p.11) maintained that cable and DSL providers still have a strong incentive to carry more content and websites to maximise consumer utility and encourage consumers to spend more money for access to the service. “The platform monopolist has a powerful incentive to be a good steward of the applications sector for its platform”, said Farrell and Weiser (2002, p.21)

Nevertheless, Yoo (2006, p.4 in his debate with Wu) conceded there may be a case for regulatory intervention that prohibits vertically integrated network owners from blocking content and applications that directly compete with their own offerings. Post-Chicago School literature utilising modern industrial organisation theory to analyse more complex market structures has thrown light on how firms with market power can raise the costs for potential rivals. (Roycroft 2006a, p.39–41) In the business of broadband delivery, incumbent operators with sunk investments in optical fibre in the access network are in a powerful position to make price cuts in the face of entry, defending their existing customer relationships and market share. The potential for harm to consumers is compounded if the incumbent is also free to discriminate in providing applications and content.

The antithesis of a vertically integrated broadband operator is a common carrier in that it can have no interest in the content carried, its chief obligation being non-discrimination. This led Vint Cerf to comment: “One might think of the notion of [network] neutrality as the 21st Century version of common carriage”. (As cited in Sandvig 2006, p.19) Perhaps this observation signals the fate of the network neutrality movement in the US since the FCC had already removed any vestige of common carriage for Internet broadband service delivery via cable modem, DSL or optical fibre and the telecommunications industry would never countenance its re-imposition.

DISCUSSION

The previous analysis gives a mixed picture: whereas neutrality antagonists posit a clear difference between open access and network neutrality, neutrality proponents are somewhat ambivalent. In any case, which arguments or issues could be more relevant to the Australian scene?

THE CONNECTION WITH OPEN ACCESS

Both open access and network neutrality proponents are seeking to address alleged discriminatory practices, though in different ways and to differing extents.

The US debate was originally framed in terms of open access to cable modem systems in that the owners of cable television networks should be required to allow access to independent ISPs. (Yoo 2005, p.43) (van Schewick 2005, p.3) In other words, they should not be allowed to discriminate against ISPs with whom they had no commercial affiliation. If enshrined in law, open access would create a new right for ISPs rather than for customers. (Wu 2004, p.89) Although customers would benefit through an increased choice of service in broad terms, the debate never

laid down any prescription as to how such services should then be treated. The prime goal of open access was to protect competition between ISPs.

But according to the economic modelling of van Schewick (2005, p.40), even the threat of such competition may not necessarily impede the ability and incentive of a network provider “to discriminate against unaffiliated producers of complementary products or exclude them from its network”. A stronger prescription, that of rules favouring network neutrality, would be necessary “to protect competition in complementary products such as Internet applications, content and portals from anticompetitive behaviour by network operators or ISPs”. (van Schewick 2005, p.3) Network neutrality would create the right for users to access the content, applications and equipment of their choice. (Wu 2004: Pt.3) The prime goal of network neutrality was to protect competition between Internet-based content, applications and equipment rather than between ISPs.

Van Schewick's explanation goes at least part way towards understanding why the push for 'open access' fell by the wayside in the US by 2002 and 'network neutrality' became ascendant thereafter. However, network neutrality was a convenient label that belied a complexity of concepts. Although championed as a founding proponent of neutrality, Wu actually argued for a policy of 'broadband discrimination' – reflecting the realisation that there could be occasions where discrimination against certain content and applications was acceptable yet on other occasions it could be unacceptable. (Wu 2003) Since open access ran counter to vertical integration, Wu envisaged circumstances where the lack of vertical integration could hurt the cause of network neutrality. This led him to conclude that “it is best to understand network neutrality as an end, and open access and broadband discrimination as different means to that end”. Simply put, a goal of open access could be inadequate and in some instances counterproductive.

Frischmann adopts a different approach by developing a theory of infrastructure that better explains why, for some classes of important resources such as the Internet, there are strong economic arguments for managing and sustaining the resources in an openly accessible manner. With much more at stake than the current debate reflects, he argues that “a new lens is needed”: (Frischmann 2005: 920, 1020–1022)

The network neutrality debate is not really about neutrality per se; nor is it about innovation alone. The debate must broaden its focus from the merits of sustaining an *innovation commons* to the merits of sustaining an *infrastructure commons* – that is, of sustaining open, public access to infrastructure. The debate ought to be about optimizing the Internet for society as a whole and it ought to take into account the full range of interests at stake. This type of optimization problem raises the familiar issues and choices seen in other debates over open access or restricted access. What type of infrastructure do we as a society desire? Do we prefer an Internet infrastructure managed in an openly accessible manner? Or, do we prefer an Internet infrastructure managed to maximize the profits of property owners? There are benefits and costs to both types of management regimes that need to be carefully evaluated and balanced.

The theory brings into focus the social value of sustaining an Internet infrastructure commons, and strongly suggests that the benefits of open access (costs of restricted access) are significantly greater than reflected in the current debate.

In other words, Frischmann elevated the importance of open access well beyond that considered by Wu which confirms the ambivalent attitude of some network neutrality proponents towards open access.

Commenting on Frischmann's theory, Lessig observed that the policy debate since the late 1990s has bounced between two different strategies: (Lessig 2005)

- The open access strategy, the basis of which was that competition in access providers would disrupt the conditions under which it would make sense for network providers to interfere with the 'end-to-end commons'; and
- Adoption of the four 'Internet freedoms' articulated by FCC chairman Michael Powell, such that a network provider would not bias or hinder choice provided to consumers. (Powell 2004)

In his testimony to a US Senate hearing on 'network neutrality', Lessig reiterated his long-standing contention that the wide range of innovation inspired by the Internet has come primarily from the 'edge' or 'end' of the network through application competition. (Lessig 2006, p.4–5) He had once assumed that competition in broadband access would prevent any compromise in end-to-end neutrality, with no individual ISP having the market power to successfully restrict the range of Internet applications, but more recently the scholarship of van Schewick raised doubt as to whether open access would protect network neutrality – the question of such a linkage was “now effectively moot”. Open access was only an indirect means to preserving the main goal of end-to-end neutrality, Lessig (2005, p.1041) now believed.

Since Lessig had invested so much intellectual effort in making the case for a neutral Internet, it is understandable he should see the relationship with open access in this light. Perhaps a more independent appreciation is given by Nuechterlein and Weiser (2005) who examined instances where a dominant provider of physical layer transmission infrastructure exploits its control of bottleneck facilities to stifle competition in the adjacent markets for applications and content. They presented the three non-exclusive regulatory approaches to deal with these monopoly leveraging concerns as being: (Nuechterlein and Weiser 2005: Ch.5)

- Multiple ISP or open access;
- Network neutrality and preservation of the end-to-end principle; and
- Unbundling rules for wireline broadband, particularly as applied to new builds of optical fibre in the CAN.

Access to such a suite of regulatory tools would be a start in achieving Frischmann's goal of sustaining an infrastructure commons.

RELEVANCE OF ISSUES TO AUSTRALIA

The preceding analysis has identified the main debating issues as being those of diversity/differentiation, investment incentive, last-mile competition and vertical integration. The first, diversity/differentiation in Internet applications and services, appears to be the *cause celebre* for proponents of network neutrality yet it is primarily a consequence of the last two issues: inadequate last-mile competition and vertical integration resulting in a heightened tendency for discriminatory

practices. The matter of investment incentive is usually aired when an entrant seeks to counter an incumbent's last-mile broadband infrastructure or an incumbent threatens not to undertake further investment considered to be nationally important. It is generally promoted as a cure for ills arising from the last two issues.

The US and Australian telecommunication scenes differ significantly as regards last-mile competition, Australia being in a much worse situation, and this exacerbates problems attributed to vertical integration. According to the Australian telecommunications regulator: (ACCC 2005b, p.4)

The overriding issue in this industry is the dominance of the telecommunications sector by just one player – Telstra – by virtue of it being the sole provider of the ubiquitous local access network connecting virtually every home and business in the country. This monopoly means that even in the more competitive markets, those seeking to compete with Telstra continue to rely on Telstra for some form of access to its network.

An assessment of Australian telecommunications infrastructure as at 2004 indicated that Telstra held the majority of local access connections, 92.94 per cent, with SingTel Optus being the main alternative carrier with 6.54 per cent of connections. Together they held approximately 99 per cent of subscriber connections, confirming a high level of concentration in the business of fixed network local access services.³ (ACCC 2005a) Only 15.5 per cent of Telstra's local access network capacity was being used by third party service providers, primarily for the provision of xDSL broadband services.

The extent of concentration in Australian last-mile infrastructure is further compounded on realising that the overwhelming amount of hybrid fibre coaxial or HFC network roll-out is also owned only by Telstra and SingTel Optus, mostly duplicated in the same streets of the major cities, and the cable modem capacity of each is monopolised by their respective ISPs. The extent of infrastructure concentration becomes even more stark on considering the potential for delivering broadband at 'next generation' speeds, defined for the sake of this argument as having a symmetric capability in the realm of 100 Mb/s but in any case depending on the future deployment of technologies such as DOCSIS 3.0, VDSL, ADSL2+ and/or optical fibre in the access network.

DOCSIS 3.0 technology can only be deployed on the monopolised and duplicated HFC networks of Telstra and Optus, whilst technologies such as VDSL and ADSL2+ are deployable only on the paired copper network of Telstra – though may be operated by either Telstra or a third party provider. As to the roll-out of optical fibre deeper into the access network, a prerequisite for wider availability of VDSL or ADSL2+ delivered services, or in the long term for fibre to the premises-based services, the situation of Telstra threatening not to invest in its own 'fibre to the node' infrastructure is a sign of ongoing dominance in the market for next generation broadband services. (Kelso 2008a)

Telstra has been strenuously demanding regulatory forbearance for its proposed FTTN network, in other words it has been seeking an investment incentive by way of an 'access holiday'. The very term 'access holiday' can sound deceptively innocent, yet access holidays are antithetical to the principle of open access. (Kelso 2008b) Telstra is the lead player in most segments of the Australian telecommunications sector, except for free-to-air broadcasting, and is arguably “the

most vertically integrated telecommunications operator in any member of the OECD”, according to Cutler (2001).

Whilst the debate in the US over network neutrality has been quite heated particularly during 2005/06, only whispers have been heard in Australia. According to Gans (2006), the proponents of network neutrality don't really hit on the key point: that users who choose a high-speed content provider over another do not internalise the costs they are causing by this. He considered the core problem of network neutrality to be that it is not neutral for the providers but too neutral for the users and proposed a new concept of 'neutral networkity' – where the content providers decide the speed of their connection, with access given to all users at equal speeds. Gans said “the debate should not be over network neutrality per se but the use of exclusive deals offered through particular content providers and integration of content and infrastructure providers”, with Telstra's BigPond, an ISP with the greatest share of the Australian market, being a prime example.

COMPETITIVE ACCESS IN AUSTRALIA

Since the early 1990s, Australia's electricity, gas, telecommunications, water, rail, air services and port services industries have all progressed towards more open markets and greater competition. However, many of these industries involve bottleneck infrastructure for which competition becomes difficult if not infeasible. Following recommendations in the 1993 Hilmer Review, the Commonwealth Government introduced a national access regime for such infrastructure that was implemented via a new Part IIIA of the Trade Practices Act 1974 (TPA).

This regime established legal rights for third parties to share the use, on reasonable terms and conditions, of certain infrastructure services or facilities deemed of national significance. For example, such a third-party could gain the right to access the railway line of another company to run its own trains. In this context, 'third-party access' meant that a competitive service provider could gain access to the infrastructure or services of another service provider and in so doing establish access to a new customer base.

With the introduction of open competition into the Australian telecommunications market commencing 1 July 1997, the Australian Competition and Consumer Commission (ACCC) gained the power to mandate access to a carriage service by 'declaring' that service under a new Part XIC of the TPA. The prime object of Part XIC is to promote the long-term interests of end-users (LTIE) in what are called 'listed services', that is, carriage services or services provided by means of carriage services. In determining what constitutes the LTIE, the ACCC must pay regard to the objectives of promoting competition in markets for the listed services, achieving any-to-any connectivity in relation to carriage services that involve communication between end-users, and encouraging the economically efficient use of, and the economically efficient investment in, the infrastructure by which the listed services are supplied.

Unfortunately, the more generalist Hilmer approach to opening access to bottleneck infrastructure – coupled with continued political interference – has failed in the case of Australian telecommunications. The historical record shows that successive Australian governments have never really committed to third-party access for services derived from infrastructure beyond that of the paired copper public switched telephone network or PSTN. (Kelso, 2008a: Ch.8) Once broadband services deliverable via post-PSTN access infrastructure came into contention from 1994 with the advent of HFC delivered pay television, the telecommunications access regime has

been repeatedly compromised by the granting of incentives for investment that favour incumbency. These government interventions have had the practical outcome of being generally anti-competitive, effectively killing off any realistic prospect of competitive access to the services of post-PSTN infrastructure.

The regulatory regime for access is now labyrinthine and wide open to gaming. It has been exploited by access providers – primarily Telstra – to cause years of delay, wearing down the ability of access seekers to ultimately compete. Access providers are encouraged to be obstructive in dealing with access seekers. However, the situation is bleaker than that. The ACCC must first 'declare' (that is, decide to regulate) a particular service before competitive access can be enabled. Without declaration, competitive access is closed and the monopolisation by Telstra and Optus of cable modem capacity on their respective HFC networks is a key case in point.

There is no general right of access under Part XIC of the TPA; the whole concept of 'open access' – depending upon what that is to mean in practice – has been foreign to Australian telecommunications. Faced with the need to implement the Rudd government's 2009 vision of a national wholesale broadband network, there is now a once in a lifetime opportunity to rectify this deficiency.

COMMON CARRIAGE IN AUSTRALIA

Not so long ago there was another way of dealing with access to telecommunications facilities and services, but it has been stealthily excised from legislation. It is called 'common carriage' and is central to the realisation of any future open access regime. The principle of common carriage is rooted deeply in English common law. Early examples of common or public occupations that attracted special obligations included those of ferrymen, innkeepers, surgeons and wharf operators. 'Common' in that context meant 'open to serving the general public' or 'general'.

In more modern times, businesses such as postal services, railways, telecommunications, airplanes, taxis, roads and utilities have been treated as common carriers. While each has a different history of attaining such classification, they appear to share two dominant characteristics, viz. offering service to the general public, regardless of private ownership or operation, and the delivery of undifferentiated service such as carriage or of commodity items.

The basic principle of common carriage in telecommunications, that all users must be served without discrimination, has played an important role in the infrastructure services of transportation and communications, aiding telecommunications users' access and thereby also stimulating the development of networks. The most critical factor in mass adoption of the Internet has been the carriage obligation of telephone companies that permitted dial-up access between users and Internet service providers (ISPs). This non-discriminatory connection of modems, using signals that mimic telephony calls, connected end-users with narrowband ISPs who in turn had established data lines to the public Internet.

Prior to 1975, telecommunication network and service access in Australia was not an issue as the Postmaster-General's Department was a monopolistic government-owned carrier and competition was simply not permitted. After 1975, the Australian Telecommunications Commission (Telecom) continued the national responsibility for providing a standard telephone service. It could only discriminate by refusing such provision on the grounds of impracticality or the services not being reasonably required. The Minister could also direct the Commission as necessary 'in the public interest'.

During the 1980s, the monopoly powers of Telecom were increasingly brought into question by the government, inquiries and embryonic competitors. By 1989, Telecom retained the monopoly to provide services via the PSTN but all services other than those 'reserved' for Telecom were open to competition, such as the provision of value added services and private networks. Where Telecom refused or failed to supply a standard telephone service, the new regulator (AUSTEL) could direct Telecom to carry out its community service obligation. Telecom was also obliged to connect to these embryonic competitors and was prohibited from discriminating against them.

This somewhat fading semblance of common carriage continued through the Telecommunication Acts of 1991 and 1997, but only in the form of requirements for all carriers to interconnect and for Telstra to be obliged to deliver a standard telephone service to the whole community, resulting in the Universal Service Obligation. The key point to note is that this spirit, though not reality of common carriage has been limited to telephony or telephony-like services and cannot deliver high bit-rate data services.

A GOLDEN OPPORTUNITY

Australian legislators now have the opportunity to restore effective non-discriminatory carriage and service delivery to the proposed national broadband network, not just in the form of a nominal obligation for 'open access' to enhance competition between retail service providers, but by creating a regulatory regime that directly empowers end-users by granting them at least a similar degree of choice and control over service delivery as they have long experienced with the PSTN.

Thanks mainly to non-proprietary Internet protocols, affordable personal computing power and user-centric applications, there has been a marked shift in intelligence towards the ends of any network connection – and at these ends the equipment is owned and operated by users. Broadband users in particular have taken much more control of their connectivity and are becoming decidedly more participative, rather than being passive recipients. In comparison, the proposed NBN should be designed and regulated as being relatively dumb, more of a transmission pipeline, and reliant on the Internet continuing to act in a substantially non-discriminatory manner to packets of information sent to and from users.

Steps are now being taken to implement the Rudd government's 2007 election promise to create an NBN operated under so-called 'open access' principles.⁴ Defined in the 2008 Request for Proposals as facilitating competition that will “ensure equivalence of price and non-price terms and conditions, and provide scope for access seekers to differentiate their product offerings”, this form of open access relates only to the input terms and conditions provided by the NBN wholesale operator to the NBN retail operators who will mainly be ISPs.

Until now, open access has been a concept foreign to Australian telecommunications regulation. In terms of next generation broadband, TransACT is the only example in Australia of a working open access network yet it was implemented voluntarily under a set of market circumstances unlikely ever to be repeated. (Kelso, 2008a: Ch.5)

Open access as currently defined by the government does not guarantee that the NBN will deliver services to end-users in a neutral manner, nor provide end-users with any-to-any connectivity in a neutral manner. Network neutrality creates the right for users to access the content, applications and equipment of their choice. The prime goal of network neutrality is to protect

competition between Internet-based content, applications and equipment rather than foster competition between retail ISPs.

CONCLUSION

The network neutrality debate in the US has provided the opportunity to appreciate the main issues in contention there and how they relate to the principle of open access. It is about as traditional a competition policy debate as you can get. Central to much of the debate have been concerns about inadequate last-mile infrastructure for the current realisation of broadband service delivery and fears about the scope for discriminatory practices capable with developing technologies.

Frischmann called for “a new lens” to be applied to the debate, which should be broadened from its focus on the merits of sustaining an *innovation commons* to the merits of sustaining an *infrastructure commons* – that is, of sustaining open, public access to infrastructure. He asked “what type of infrastructure do we as a society desire”?

On first assessment, these matters appear to have been nominally addressed in Australia with the Rudd government's 2007 election promise to create a national wholesale broadband network (NBN) to be operated under so-called 'open access' principles. Open access, as applying to wholesale services provided over the NBN, has been defined in the 2008 Request for Proposals as facilitating competition that will “ensure equivalence of price and non-price terms and conditions, and provide scope for access seekers to differentiate their product offerings”.

However end-users may be lulled into a false sense of security by assuming that this prescription of open access at the wholesale level to facilitate retail competition is all that is required to protect their better interests. As such, it relates only to the input terms and conditions provided by the NBN wholesale operator to the NBN retail operators (mainly ISPs) and prescribes nothing more. Open access as currently defined by the government does not guarantee a network that will deliver services to end-users in a neutral manner, nor provide end-users with any-to-any connectivity in a neutral manner.

End-users must not lose sight of the fact that an additional prescription for the NBN to be ‘neutral’ refers to protecting and enhancing competition between primarily Internet-based content, applications and end equipments from anti-competitive behaviour by both the NBN wholesale operator and the NBN retail operators. The government's current proposal for ISPs to filter out so-called objectionable content may be of particular concern to end-users desiring to achieve neutral access to the Internet.⁵

Vint Cerf's comment is particularly poignant – that one might think of the notion of [network] neutrality as being the twenty first Century version of common carriage. An underlying policy goal of common carriage and network neutrality must remain central to the effective realisation of any open access regime legislated to realise the Rudd government's 2009 vision of a national wholesale broadband network.

ENDNOTES

¹ Refer to Business Week, 7 November 2005, “At SBC, it's all about ‘scale and scope’”: http://www.businessweek.com/magazine/content/05_45/b3958092.htm accessed 12 May 2009.

- ² The FCC, under the chairman following Powell, instead adopted a policy statement outlining four principles embodying a set of 'entitlements' that consumers should be able to expect from the Internet; refer to FCC (2005). FCC Adopts Policy Statement: New Principles Preserve and Promote the Open and Interconnected Nature of Public Internet. Media Release. Washington, DC 20554, Federal Communications Commission: 1.
- ³ These measures would have barely changed since 2004.
- ⁴ Refer to the April 2008 release of a Request for Proposals for an industry-operated network: http://www.archive.dbcde.gov.au/2009/april/national_broadband_network_request_for_proposals_process and the April 2009 announcement for a government-operated enhanced network: http://www.dbcde.gov.au/communications_for_business/funding_programs_and_support/national_broadband_network accessed 12 May 2009.
- ⁵ Refer to the February 2009 Ministerial media release: http://www.minister.dbcde.gov.au/media/media_releases/2009/005 accessed 12 May 2009.

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