

Comments on Discussion Paper for the National Bandwidth Inquiry

Acknowledgments

The Internet Society of Australia (ISOC-AU) welcomes the result of the 1998 initiative of the Minister for Communications Information Technology and the Arts, Senator the Hon Richard Alston, in asking the Australian Information Economy Advisory Committee (AIEAC) to give further examination to the issue of bandwidth.

In addition, ISOC-AU welcomes release of the Discussion Paper for the National Bandwidth Inquiry prepared by the Minister's Department under the guidance of a sub-committee of AIEAC including the valuable information that has been assembled for public consideration.

The paper presents an invaluable assembly of information about the issues of bandwidth to assist informed public consideration of the issue. However, ISOC-AU is concerned about the short period allowed for public comment and looks forward to further opportunities for input to the process of considering policy on bandwidth.

Summary

- ISOC-AU supports the general thrust of the vision for bandwidth presented in the discussion paper, particularly for the recognition that the Internet protocol provides a common platform for many of the currently separate electronic communications services. ISOC-AU stresses the importance of using bandwidth to foster a culture of innovation and full participation that is consistent with the points presented in the paper. In our view it is essential to consider bandwidth policy issues in this context.
- ISOC-AU is concerned that there may be some complacency about the supply of high bandwidth. The paper makes the point that there is substantial potential carrying capacity available from installed fibre optic cable. However, this capacity is not presently available to users of technology in the form of cheap high bandwidth connections. ISOC-AU welcomes recent announcements of additional supply, such as Telstra's data mode of operation and asymmetric digital subscriber line, but is concerned that these supplies may not be widely available due to market structure and pricing policies. That is not to say there should be general subsidies but excessive profits generated by high prices should be avoided.
- ISOC-AU considers that the demand modelling undertaken for the study is not placing Australia in the best position to take advantage of immediate technical, economic and social opportunities. The modelling predicts a surge in demand for bandwidth in six years time. However, there are immediate needs for widespread

access to cheap high bandwidth and Australia is already two to five years behind the USA according to the discussion paper. Access to cheap high bandwidth is essential for Australia to close this gap by giving easy access to a wider range of user friendly applications. If Internet access is slower in Australia than in the USA, the Australia is at a competitive disadvantage vis-a-vis the USA.

- Pricing of data services has been based on a legacy of giving prime position to the provision of voice telecommunications services. ISOC-AU considers that this situation should be corrected now that trend for adoption of the Internet Protocol (IP) is clear. There is an urgent need to implement voice over IP and make high bandwidth IP the ubiquitous standard for Australian telecommunications. Adoption of this standard would provide more efficient use of existing bandwidth according to the paper at the same time as providing improved high bandwidth data services for users.
- ISOC-AU welcomes Government initiatives to open the market for telecommunications. Inclusion of ISDN in the universal service obligation (USO) has been aimed at improving the delivery of data services. Even so, policy has not kept pace with the rate of advancement of technology. There is an urgent need to continue to open the full range of markets for bandwidth in Australia and remove regulatory barriers to participation in these markets.
- It is important that Government develop new policy initiatives aimed at developing access to high bandwidth data services across Australia that are appropriate to our particular national circumstances. In regional and remote areas, for instance, a wide range of delivery mechanisms should be possible including satellite based user access. The tax system should provide funding of the universal service obligation (USO) rather than other telecommunications users, due to the national benefits available from full regional access to data services in particular, and the Government's recent provision of funds to Telstra for this purpose is a welcome step.
- ISOC-AU has prepared a timetable to bring Australia to an internationally competitive position in supply and use of high bandwidth data services based on the IP protocol by December 2001.

Importance of Bandwidth

ISOC-AU supports the broad vision for bandwidth presented in the discussion paper particularly in relation to the economic and social importance of adequate bandwidth and widespread access to bandwidth. Provision of adequate access to bandwidth is fundamental to ensuring that Australia will be one of the information haves in the coming information age. This position is essential for Australia's economic and social success. The four strategies for developing a successful business climate mentioned in the Far Eastern Review (July 1, 99, p9) may be a useful guide in this respect:

- a wired infrastructure and cheap real estate,
- legal systems that nurture knowledge based industries,
- liberalising communications, and
- investment in a tech-savvy workforce.

The Internet, and the IP protocol in particular, is currently the most popular standard for electronic information sharing. We support the view expressed in the paper, that the Internet will become the fundamental tool for managing and accessing information. However, we consider that Australia is lagging in its user access to bandwidth.

A key question that is not explicitly discussed in the paper is 'why does an advanced country like Australia, which is an excellent technology adopter, have to wait to access high bandwidth networks?' The paper discusses the range of issues surrounding access to bandwidth but does not address this issue directly. In our view, the answer to this question is fundamental to delivering the vision for bandwidth presented in the paper.

Supply of Bandwidth

The analysis of terrestrial backbone bandwidth in the paper could mislead some into complacency on the general issue of access to bandwidth. The paper concludes on page 108 that "the existing telecommunications physical infrastructure in place in Australia should be capable of meeting Australia's trunk communications infrastructure needs on almost any conceivable scenario". This conclusion is very sweeping and arises from the paper's analysis of the potential carrying capacity of existing inter and intra city fibre optic cables. The paper discusses a range of issues that do not support this sweeping conclusion. In addition, this conclusion does not take account of crucial user access issues relating to demand and pricing. Also it does not explicitly account for disaster planning, such as the loss of power to the whole Sydney CBD recently.

ISOC-AU considers that available bandwidth is insufficient for current user purposes and is not even sufficient for research purposes. There is no widespread access to high bandwidth in Australia. The paper implies that backbone capacity per capita would support gigabit data transfer in all urban areas except towns of less than 1,000 people (Table 5.3 p 40). Yet this bandwidth is not being made available to network users at lower prices.

There is no Australian high bandwidth research network equivalent to the USA's Internet 2 (www.internet2.edu) or Canada's CANARIE (www.canarie.ca). The experimental broadband network (EBN) was provided with \$3 million of funding in 1994 as the basis for research among leading information technology Cooperative Research Centres (CRCs) but the EBN never eventuated. ISOC-AU is aware of other proposals for small high bandwidth trial networks that have failed to eventuate. Currently policy arrangements are not flexible enough to allow interworking of the research community with industry on high bandwidth networks. ISOC-AU considers that it is vital that industry and researchers work closely together to develop and test new high bandwidth applications in Australia.

ISDN technology has been available since the early 1980s and only recently has the Government introduced 64k bit data to the USO. Unfortunately, this apparent boost to availability of data services will only expand the use of older technology. It will not introduce high bandwidth technology and the cost of access to higher bandwidth will continue to be an issue as discussed in the paper.

Asymmetric Digital Subscriber Line (ADSL) technology for providing high bandwidth over copper, has been known to the industry for at least 5 years. According to the paper (p49) ADSL is already widely used in the USA and Europe. Telstra has only recently announced plans to introduce ADSL widely. Industry sources still consider that these plans are not firm. Further, there has been no statement on pricing of access to ADSL. ISOC-AU considers that the appropriate pricing strategy for ADSL should allow mass user access in both national and private interests.

The discussion paper's analysis of the potential capacity of the existing fibre network (as opposed to the installed capacity) depends heavily on the success of dense wave division multiplexing (DWDM) and increased efficiencies from implementing voice over internet protocol (IP). These two technologies are yet to be proven in operations. The discussion paper raises potential issues about the reliability of voice over IP and DWDM remains a coming technology. ISOC-AU agrees that these technologies provide substantial promise and considers that Australia urgently begin trials with both technologies to allow early implementation.

The discussion paper points to limited availability of bandwidth in regional/remote areas and ISOC-AU supports this analysis.

ISOC-AU considers that the substantial potential bandwidth available from fibre, that has been installed to date, is not in use for reasons of demand, price and market structure.

Demand

The paper says that it is difficult to identify whether or when any 'killer application' may develop and what implications such an application may have for bandwidth demand. Only one of the Consultant's analyses for the discussion paper included a hypothetical once off 28% growth in bandwidth demand. ISOC-AU considers that this approach may encourage complacency among policy makers and Australian business. Elsewhere the discussion paper states (p19) that the United States timing advantage has been estimated to be between two and five years. ISOC-AU considers that this time lag is partly due to limited availability of cheap bandwidth. It would be better to ask the question: 'why does an advanced country like Australia, which is an excellent technology adopter, have to wait to access high bandwidth networks?' Often a reason to wait a little longer is to identify a clear trend in the development of standards. In relation to bandwidth it is now clear that the popularity of the IP standard is substantial and that it can be employed to deliver high bandwidth to users.

The potential economic benefits of access to increased bandwidth are substantial. Already Alan Greenspan, Chair of the US Federal Reserve, is on record as crediting reduced inflationary pressure on efficiencies created by independent business use of computers (<http://www.bog.frb.fed.us/boarddocs/speeches/1999/19990908.htm>). ISOC-AU agrees with the discussion paper that there is substantial additional benefit from implementation of e-commerce provided that sufficient bandwidth is available.

There is an urgent need for access to bandwidth for foreseen applications such as mobile Internet (radio based), e-commerce, business to business commerce (e-business), video conferencing, streaming multi-cast video events, security filters and multi media applications. Unforeseen applications will add further demand. The paper itself indicates a number of important new developments (p 58) including some of those listed above. To some extent listing potential applications is not the key point at this stage. The point is to create bandwidth at a price where new developments can flourish to support growth of the so-called 'information economy'. There is already a heavy economic influence from information flows arising from the contribution of service industries to the national economy with more than 70% of gross domestic product (GDP) and employment.

In the discussion paper, both the 'realistic' and 'optimistic' scenarios of demand prediction show two times or greater increases in demand for bandwidth in the year following the five year reference period. If access to bandwidth is planned on the basis of this increase in six years from now, it may well be too late for Australia to take full economic and social advantage of these facilities.

ISOC-AU acknowledges that actual demand for bandwidth is heavily dependent on pricing, and the creation of new applications will depend heavily on the pricing strategies of major bandwidth suppliers.

Pricing

The discussion paper provides information to show that pricing of bandwidth in Australia is a legacy of our past reliance on phone communications. ISOC-AU supports this view. Australia's telecommunications network has been set up to provide high levels of reliability for voice communications through fixed path circuit switching (p17). Comparatively recently, the technology of digitisation of voice and packet switching has provided greater efficiency through implementation of ATM switching for instance. ISOC-AU supports the view that elimination of the ATM and SDH layers in telecommunications switching would result in further increases in bandwidth efficiency.

Past business strategies have led to data services being priced at a premium and their reliability has been sacrificed in the interests of maintaining the voice network. These pricing and implementation policies have had the effect of limiting application of data services. Surprisingly, this approach has continued even when the underlying functioning of the telecommunications network was moving to voice over data through packet switching. With hindsight, this strategy was shortsighted. Greater national benefit could have been achieved by treating voice and data transmission equally.

Now there is an urgent need to implement voice over IP and make high bandwidth IP the ubiquitous standard for Australian telecommunications. In this regard, ISOC-AU welcomes the initiatives of Telstra in moving to implement Data Mode of Operation (DMO) and ADSL. However, ISOC-AU considers that it is essential that these initiatives be priced to attract mass markets, not at a premium for a smaller more exclusive market. Such an approach should boost company profitability and enhance international competitiveness.

Market Structure

With hindsight, Australia's policy environment has been too slow to keep up with technological developments. Major telecommunications companies have been allowed to continue to extract value from existing technology structures without moving to adopt new technologies at sufficient speed. In these circumstances, little more can be expected of companies that are seeking to maximise profits and shareholder value. So, it is essential for Government to take a role in pursuing the national interest. Market dominance must continue to be reduced through increased competition and policy must move more quickly to take account of high-speed technological change.

The discussion paper forecasts that even in five years time full competition will not apply in the markets for minor intercapital, medium regional, minor regional, remote and some

international (Table 7.1). This situation would be unacceptable from the viewpoint of national benefit. In this very fast moving field, five years is a long time. Five years ago there were barely a few hundred world wide web sites world-wide. There are technological solutions for each of these market segments that mean that they are not naturally restrictive of competition. The paper points to a range of technical solutions that can be applied in less populated regions outside metropolitan areas, including satellite technology.

Regulatory barriers to the participation of a full range of telecommunications providers in these markets should be removed. It would help if the Australian policy environment could support an Australian equivalent to Qwest, ie a start up company that is clearly focused on IP and massive provision of new bandwidth, both in the backbone and to end nodes.

The Government has made a number of welcome initiatives for increasing access to data services in regional areas. Funding for this initiative has been boosted by money generated from the sale of Telstra. In the longer term, however, these funds will be exhausted and there should be a move to more commercial supply of services, supported from the universal service obligation where necessary.

Policy Implications

The government's policy initiative of introducing the 64k data service into the USO is welcomed. This initiative will help to shift the administration of telecommunications services to a more balanced position in respect of voice and data services. However, the need for access to cheap high bandwidth services is urgent and more needs to be done.

ISOC-AU has developed the following timetable of policy targets to bring Australia to an internationally competitive position:

- implementation of a high bandwidth research network by June 2000 accessible to researchers and industry,
- removal of 'rebalancing' by December 2000 where one group of telecommunications customers subsidises access for another group,
- completion of the USO 64k bit requirement by December 2000,
- access to mega bit bandwidth for all businesses by June 2001, and
- universal access to megabit bandwidth by December 2001.

ISOC-AU considers that the following policy mechanisms should be employed to achieve the above timetable:

- support for competitive structures across all markets and international connections, including open access for service providers

- continued policy initiatives aimed at developing access to data services in regional and remote areas, including satellite based user access, with the goal of establishing these as commercial services

- the tax system should fund any USO obligation; justified by the social goal of eliminating information have-nots, including subsidy of regional/remote consumer connections

- continued support for research by removing regulatory barriers to a high bandwidth network open to industry as well as researchers

A further option that would require careful consideration is whether Telstra currently has a conflict of interest as operator of backbone and user services. The potential to split current Telstra operations into a range of services has complex social and operational dimensions that could warrant consideration by a parliamentary committee.

Tony Hill
Executive Director

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