CONSULTATION PAPER ISSUED BY THE INFO-COMMUNICATIONS DEVELOPMENT AUTHORITY OF SINGAPORE

NET NEUTRALITY

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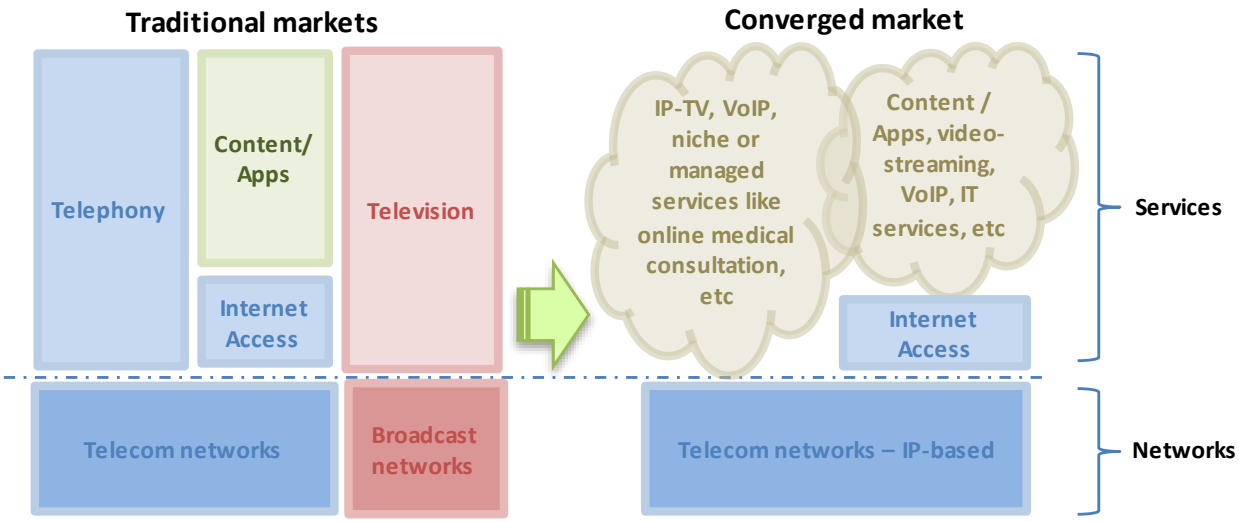
PART I: INTRODUCTION

1. The Internet, a global system of interconnected computer networks that uses the Internet Protocol ("IP") as the data communication or transmission protocol, originated in the 1960s in the United States ("US") arising from research into robust, fault-tolerant and distributed computer networks. Since the commercialisation of the Internet in the 1990s, there is now estimated to be more than 758 million hosts[1] and 1.8 billion users[2] of the Internet. Today, this 'network of networks' plays a key role in our everyday life, work and play, connecting people, businesses and communities, and providing an ever-growing suite of information services, communication and productivity tools, commerce opportunities, educational channels, entertainment options, and more.

2. The Internet has enabled the creation of these new forms of applications and services by bringing together the traditionally separate worlds of information technology ("IT"), telecommunication ("telecom") and broadcast, a trend often called "convergence", as illustrated by Diagram 1 below. Traditionally, end-users accessed the Internet mainly to surf the World Wide Web and use online communication services such as email or instant messaging. Today, one can also make telephone calls and watch videos and television shows via the Internet instead of over the traditional telecom and broadcast platforms, or use online software tools in place of off-the-shelf software solutions. This has caused shifts in market boundaries and business models with some Internet companies entering the IT, telecom and video/television arena to offer such services in competition with the traditional IT, telecom and broadcast players. Some telecom operators have also crossed into the media sector, offering video-on-demand and television shows over their broadband networks.

[1] Internet Systems Consortium, Internet Domain Survey – Host Count http://ftp.isc.org/www/survey/reports/current/

Diagram 1: Convergence of IT, telecommunication and broadcast



3. The explosion of applications and services on the Internet and increasing demand for Internet (in particular bandwidth-intensive content such as video streaming), has led to the exponential growth in Internet traffic. According to the Cisco Visual Networking Index[3] (Cisco, 2010), global Internet traffic is forecasted to quadruple from 2009 to 2014, reaching three-quarter of a zettabyte (or one billion terabytes) by 2014. In Singapore, total international Internet capacity[4] expanded by about 90% in just one year from 440 Gbps in 2009 to 830 Gbps in 2010. The number of subscribers to broadband Internet access has also grown over the years, as illustrated in Diagram 2 and Diagram 3 below:

2 Internet Usage Statistics - World Internet Users and Population Stats, http://www.internetworldstats.com/stats.htm

3 CISCO Visual Networking Index, http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360.pdf

4 This refers to the total activated bandwidth/capacity owned by telecom operators licensed in Singapore to carry Internet traffic. It excludes bandwidth/capacity owned by overseas operators transiting traffic through Singapore.

Diagram 2: Number of residential broadband subscribers

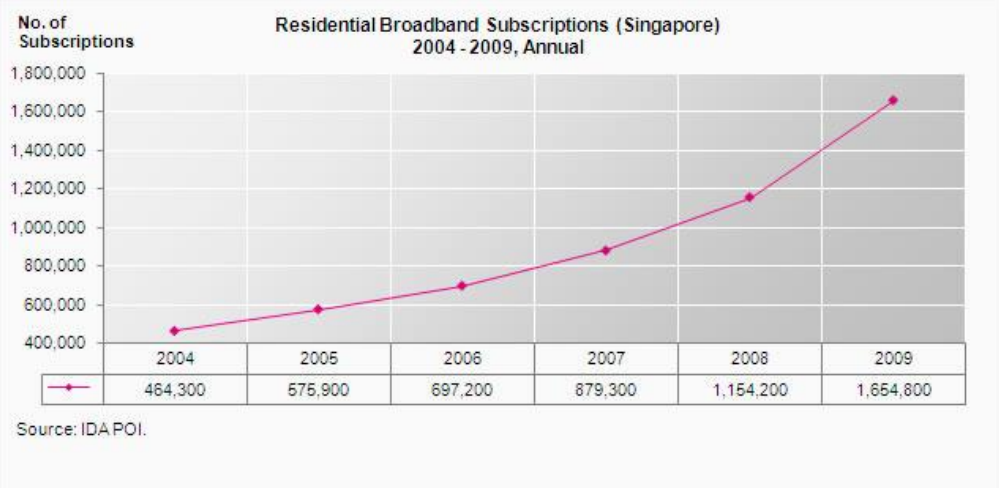
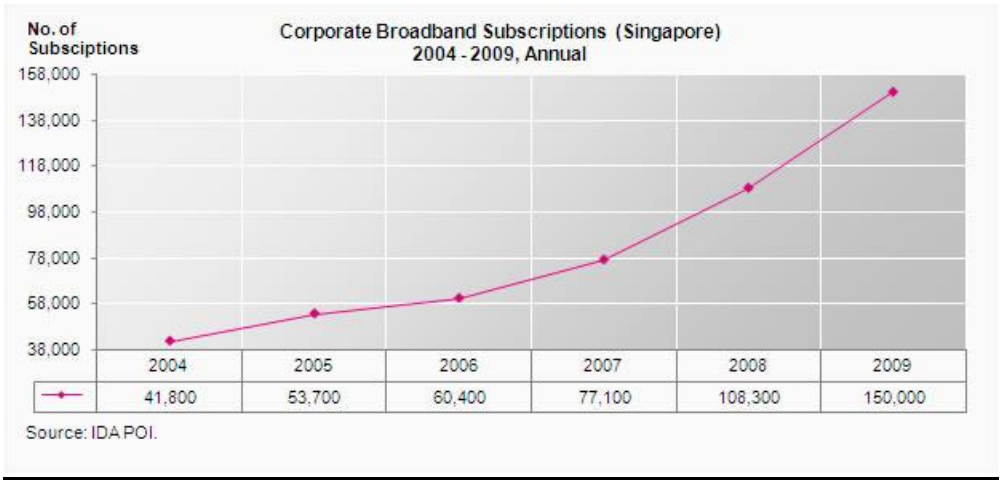


Diagram 3: Number of corporate broadband subscribers

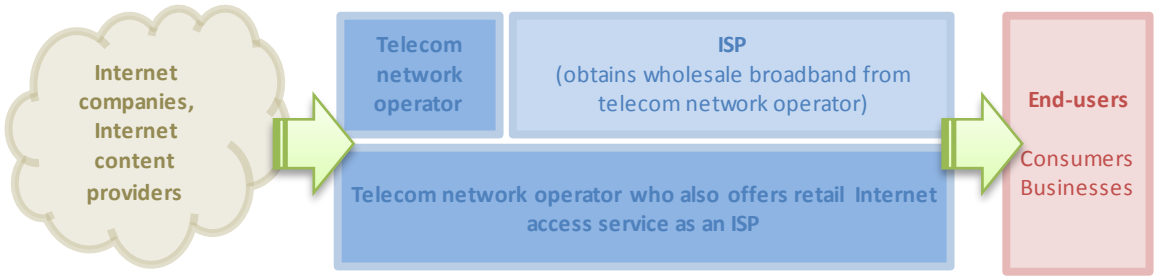


4. In the international arena, there has been an ongoing debate over the topic of 'net neutrality'. This consultation document provides a background to the debate, and seeks views and comments from the industry and public on the Info-communications Development Authority of Singapore's ("IDA") policy and regulatory approach to this issue.

PART II: DEBATE OVER NET NEUTRALITY

5. 'Net neutrality' is a term generally used to refer to Internet service or network providers treating all sources of Internet content equally, and the right of a consumer to access content and services on the Internet on a non-discriminatory basis. The Internet access market (referring to the means by which end-users access the Internet) can be viewed as a two-sided market with consumers on one side, and Internet companies on the other. Demand for an Internet service provider's ("ISP") Internet access service is dependent on both the consumer demand for Internet content, and the demand from Internet companies and Internet content providers to reach the consumers through the Internet[5]. Internet companies need to purchase IP transit services[6] or enter into IP peering[7] relationships with Internet Exchange ("IX") service providers to place their content onto the Internet. Diagram 4 below provides a simple overview of the Internet access market and the relevant parties in the value chain.

Diagram 4: Internet access market



6. The debate over net neutrality originated in the US earlier in the decade, when some ISPs imposed restrictions on connection of devices to their Internet access service, while others blocked access to certain Internet applications like Voice-over-Internet Protocol ("VoIP")[8]. Supporters of net neutrality cite various

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5 Other examples of two-sided markets include newspapers and magazines, where readers form one side of the market and advertisers form the other.

6 IP transit refers to the provision of a service, for a fee, in which one operator terminates Internet traffic (from another operator) on its network or transits the Internet traffic for termination on a third operator's network.

7 IP peering refers to the exchange of Internet traffic between two or more operators, on a settlement-free basis, for termination on each other's network.

8 These cases include AT&T warning its customers against setting up Wi-Fi home networking using AT&T's Internet service, Comcast blocking ports of Virtual Private Network ("VPN"), and Madison River Communications blocking VoIP application (Source: http://en.wikipedia.org/wiki/Network_neutrality_in_the_United_States).

ways in which ISPs or telecom network operators may discriminate or block Internet content, including:

(i) ISPs or telecom network operators forming walled-gardens [9] or imposing different charges or differential treatment (e.g., different service qualities) on Internet companies for carrying the latter group's content;

(ii) telecom network operators imposing tiered charges (based on volume, service quality, etc) for wholesale Internet broadband bandwidth sold to retail ISPs;

(iii) ISPs imposing tiered charges (based on access speeds, service quality, application type etc) for retail Internet broadband services sold to end-users;

(iv) ISPs or telecom network operators performing network management techniques on Internet traffic such as traffic prioritisation or traffic shaping[10];

(v) ISPs or telecom network operators blocking certain Internet content from being accessed by their end-users; and

(vi) Internet companies or device manufacturers controlling the content that can be accessed by end-users on their Internet platforms or devices[11].

7. The key drivers of the above actions are likely to be: (i) the convergence of IT, telecom and broadcast, and (ii) the increasing demand for Internet bandwidth:

(i) Convergence has spurred new business models, such as the provision of higher Quality of Service ("QoS") for delivery of time-sensitive content and services like video-conferencing or online medical consultation, and the proposition that Internet companies

[9] Walled-gardens generally refer to where network/platform operators or device makers approve content/service that can be deployed/offered on their network/platform/device.

[10] Refers to the delay of Internet data packets or prioritisation of certain data packets to control the Internet traffic in order to optimize the network performance or increase usable Internet bandwidth.

[11] For example, a smartphone device maker imposing approval requirements on content and service applications to be uploaded to its online store.

may pay ISPs or telecom network operators for premium delivery of their Internet content given the view of the Internet access market as a two-sided market. In addition, telephony services that are traditionally offered over the switched telephony networks can now be provided via the Internet, resulting in new competitive forces from VoIP providers in the telecom market. Some Internet companies are also venturing into mobile broadband communications, producing smartphone devices and online application stores. All these new business models have created market tensions among the telecom operators, ISPs and Internet companies, incentivising 'non-neutral' behaviour such as those examples listed in paragraph 6 above.

(ii) The increased demand for Internet bandwidth has led to telecom network operators and ISPs carrying out network management techniques such as traffic prioritisation and traffic shaping to manage their Internet traffic and maintain a certain level of QoS for all users. For example, some ISPs practise traffic shaping of Peer-to-Peer ("P2P") traffic during peak periods to manage data consumption spikes from P2P users and ensure there is sufficient Internet bandwidth for all their users. Some mobile broadband operators cap data volumes of their mobile broadband packages so that their networks do not suffer from data overload. Large Internet companies like Google and Yahoo! have also built their own Content Distribution Networks ("CDNs") to site their content nearer to the end-users for faster delivery.

8. The net neutrality debate currently pitches parties who argue for encouragement of network investments in one corner, against those who argue for promotion of consumer choice and innovation in the other. Proponents of net neutrality usually claim that blocking or discrimination of Internet traffic by ISPs or telecom network operators curtails consumer choice and impedes innovation. They also argue that without net neutrality rules, telecom operators have the incentive to block, degrade or impose charges for specific Internet content in favour of their own services, thereby harming competition and restricting

consumer choice. Some examples of such anti-competitive behaviour that can impact consumer interests include:

(i) Abuse of significant market power by a dominant ISP or telecom network operator: For example, a dominant ISP which has the majority market share of the Internet access market may abuse its market power by entering into an exclusive arrangement to offer premium delivery of a certain VoIP provider's telephony service, but refusing to offer the premium delivery to other VoIP providers. Such behaviour will restrict consumer choice and impact competition in the telephony services market.

(ii) Engagement of unfair practices by an ISP or telecom network operator: For example, a telecom network operator who provides Internet access service as well as VoIP service may degrade another operator's VoIP service that is carried over its Internet access network, while maintaining high service quality for delivery of its own VoIP service. Such practices will impact consumer interests and affect competition in the telephony services market.

(iii) Engagement in collusive behaviour: Competing ISPs and telecom network operators may collude to unilaterally block a specific Internet content or lower the service quality for delivering the specific Internet content. Such collusive behaviour essentially limits consumer choice as consumers cannot switch to another service provider for improved service quality.

9. On the other hand, opponents of blanket net neutrality rules assert that telecom network operators and ISPs have the right to optimise the use of their network resources and charge Internet companies or content providers for use of their broadband networks to reach consumers. Restricting the telecom network operators' or ISPs' abilities to recoup their network costs will undermine future investments and deployment of broadband infrastructure. They also opine that Internet traffic shaping or traffic prioritisation measures are necessary to ensure a reasonable QoS standard for all users of the Internet, as otherwise heavy users who download or upload massive amounts of data will hog the Internet bandwidth

and degrade the Internet access experience of other users. Moreover, it has also been highlighted that it is in fact debatable whether the Internet was ever truly 'neutral', given that Internet traffic transmission functions on a 'best effort' basis without guaranteed transmission. Telecom operators and ISPs are thus increasingly finding ways to manage their Internet bandwidth and network and/or offer different tiers of service levels (e.g., in terms of guaranteed bandwidth, access speeds and latency) to end-users.

10. The issue of neutrality of a network platform is not new. In the telecom market, there are cases of walled-gardens for mobile devices or mobile services. The arguments of allowing walled-gardens as a means of service differentiation for operators and device makers, while putting in place the conditions for competition to allow consumer choice, still hold. Those opposed to a blanket net neutrality rule argue that allowing practices of network management and differentiation in Internet access price and service can bring about innovation, economic efficiencies and benefit Internet companies and consumers, *provided* such practices do not harm competition and consumer interests[12]. As long as the market for Internet access service is competitive, 'non-neutral' actions by an ISP or telecom network operator will not harm consumer interests as consumers can choose among different ISPs or telecom network operators to find one that best suits their needs. In fact, competitive forces will incentivise the ISPs and telecom network operators to innovate and differentiate their services to meet the needs of consumers, and a blanket net neutrality rule will restrict the extent of innovation and service differentiation.

11. However supporters of net neutrality view the Internet differently from the traditional telecom and broadcast markets, given the origin and nature of the Internet. The Internet was designed with end-to-end connectivity, where the backbone network is made of dumb pipes/terminals with the intelligence engineered at the end-points. Thus, supporters of net neutrality argue that value

[12] References: (1) "Network Neutrality after Comcast: Toward a Case-by-Case Approach To Reasonable Network Management" by Christopher S Yoo, Dec 2009 (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1511892). See also other literature by the author on the efficiencies and benefits of allowing 'non-neutrality' at http://www.law.upenn.edu/cf/faculty/csyoo/; (2) "The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy" by Jon M. Peha, Sept 2006 (http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.103.3328&rep=rep1&type=pdf)

and innovation in the Internet marketplace are driven by the control that content creators and consumers (i.e., the 'end-points') have in deciding what they want to deliver and consume over the Internet.

International developments

12. Internationally, regulators acknowledge the importance of having an open Internet, while also recognising the benefits of some reasonable form of network management and service differentiation. In the US, the Federal Communications Commission ("FCC") issued an 'Internet Policy Statement' in 2005 listing four principles to preserve and promote the open Internet, which FCC subsequently enhanced in 2009 in its proposal to turn the principles into rules. Recently in June 2010, the FCC sought comments on enhancements to the legal foundation for the FCC's authority to regulate Internet broadband access issues. The Canadian Radio-television and Telecommunications Commission ("CRTC") issued a regulatory decision on network management practices in October 2009, stating that ISPs that provide retail Internet access services may use network management techniques but must clearly disclose to retail customers why, when and how the network management techniques will be implemented. The CRTC also clarified that blocking of Internet content is prohibited and that network management practices that slow Internet traffic to such a considerable extent will be considered blocking.

13. In Europe, the European Union Commission passed its Telecoms Reform package in November 2009 which included a provision for 'open and more neutral net', empowering national regulators to set minimum quality levels for Internet access. In June 2010, the European Commission issued a public consultation on net neutrality, seeking comments on whether ISPs should be allowed to adopt network management practices, whether there is sufficient competition and information transparency in the Internet market to promote consumer choice, and whether the European Commission needs to act further to ensure fairness in the Internet market or to let the industry take the lead. The European Commission expects to launch its report on net neutrality by end of 2010, taking into consideration feedback from the consultation.

14. Regulators in other European countries like France and United Kingdom ("UK") have also issued consultations in 2010 seeking views on their proposed net neutrality positions. France's regulator ARCEP recently issued its policy proposals after the completion of its consultation exercise, stating that ISPs must let end-users send and receive Internet content of the end-users' choice and must provide end-users clear information on the quality of Internet access service and network management practices deployed, and that ARCEP will study and define QoS parameters that ISPs must measure and publish periodically. In UK, the regulator OFCOM published a voluntary code of practice in 2008 regarding broadband speeds, setting out guidelines for the industry in the level of disclosure provided to customers regarding the actual broadband access speeds they can expect to experience, and the means by which this information is disclosed. This also covers disclosures regarding the specific network management and bandwidth cap policies of ISPs. With respect to the potential anti-competitive effect of discriminatory network management practices, OFCOM noted in its 2010 consultation paper that while this could be an area of concern, there was currently insufficient evidence to justify the setting of blanket restrictions on all forms of traffic management.

15. In Hong Kong, the Office of the Telecommunications Authority ("OFTA") issued a discussion paper on net neutrality in April 2009 setting out OFTA's view that net neutrality mainly concerns anti-competitive and discriminatory conducts. OFTA assessed that the competitive nature of the telecom market in Hong Kong has the ability to dilute any negative impact that would arise if an operator were to engage in non-neutral actions. OFTA also viewed that its existing regulations that address market power issues and anti-discrimination activities are adequate to safeguard against non-neutral actions that are anti-competitive and discriminatory.

PART III: THE INDUSTRY LANDSCAPE IN SINGAPORE

16. As highlighted in the introductory paragraphs, the Internet has enabled the creation of new forms of content, applications and services, revolutionising our way of work, life and play. Recognising the potential benefits that new Internet services can contribute to our infocomm industry and the economy, IDA has collaborated with the industry on various Internet-related initiatives, including the Singapore Internet Exchange ("SGIX") to enhance Internet connectivity, programmes to promote the deployment and adoption of Cloud Computing, the Wireless@SG network for convenient and seamless wireless access to broadband Internet, and the Next Generation Nationwide Broadband Network ("Next Gen NBN") that will offer ultra high-speed broadband access to all homes and businesses. The Next Gen NBN will catalyse the development and adoption of new innovative Internet services like remote medical consultation for citizens, interactive classroom systems for the education sector and real-time collaboration platforms for businesses.

17. Today, local consumers and businesses can choose from a variety of Internet access service packages in the market, delivered over various platforms ranging from asymmetric digital subscriber line ("ADSL") broadband, to cable broadband, to mobile broadband services. The deployment of Next Gen NBN has also introduced new fibre-based broadband services, with players like SingNet, StarHub, M1, SuperInternet and LGA offering high-speed broadband services of up to 100 Mbps. The competition among the ISPs has benefited end-users who are able to choose from a wide variety of Internet access services for one that best suits their needs.

18. IDA has to date not observed any instances of blocking[13] or discriminatory treatment of legitimate Internet content by ISPs or telecom network operators. IDA also understands that currently, most of the local ISPs' and telecom network operators' business models for Internet access services focus on charging the consumers for access to the Internet. In theory, if the Internet access market is viewed as a two-sided market as described earlier, the ISPs and telecom network

[13] Apart from those required by the Media Development Authority

operators can also charge Internet companies for carrying their content to the end-users. However, IDA understands that Internet companies currently do not pay any fee to the local ISPs or telecom network operators for use of their network resources to reach end-users, although the Internet companies and content providers may need to purchase hosting services, IP transit services or enter into IP peering relationships, either locally or overseas, to place their content onto the Internet.

PART IV: IDA'S POLICY POSITION

Current Regulatory Frameworks

19. IDA supports the policy that Internet access users must be able to access **all legitimate content** made available on the Internet in order to reap the social and economic benefit it renders. Legitimate content refers to all content that is not considered unlawful under local legislation and regulations. For example, under the Media Development Authority's ("MDA") Internet Code of Practice, material that is prohibited for broadcast to users via the Internet in Singapore is deemed unlawful, and such material include those that depict nudity or glorify racial or religious hatred. Internet access users also cannot expect access to content that is restricted by the content owners for various purposes, for example within a closed-user group (e.g., social networking sites or personal online blogs) or for commercial reasons (e.g., online newspapers allowing access to paid subscribers only), unless the content owners grant access.

20. While IDA supports the policy that all Internet access users must be able to access all legitimate content on the Internet, IDA also believes that for new service innovations to flourish, ISPs, telecom network operators and Internet companies or content providers must have the flexibility to develop new business models and service delivery methods to meet the needs of the market. An example of such service differentiation is the provision of an online medical consultation service over a premium Internet access service which is priced higher than a basic Internet access service, but with higher QoS on latency and data packet loss. Such differentiation strategies can help intensify competition and bring about greater benefit for consumers and businesses. With the deployment of the Next Gen NBN, there is potential for multiple service providers to enter the market to provide niche services or internet services bundled with special content, and this will introduce new/innovative services, bring about both price and non-price competition, and allow for more consumer choice.

21. IDA also recognises that network management techniques can help maintain a reasonable quality of Internet access service for all users. Most users of the Internet do not carry out bandwidth-intensive data upload or download over

the Internet. However, there may be occasions where the ISP's or telecom network operator's Internet network experiences temporary surges in data traffic which may slow down the Internet access service for all its users. In order to maintain a reasonable quality of service to all its subscribers, the ISP or telecom network operator may have to perform traffic shaping or prioritisation techniques to manage the high traffic load or maintain the integrity of the network. Hence, there are legitimate technical reasons for ISPs and telecom network operators to carry out network management practices.

22. IDA currently adopts a three-pronged approach to facilitate a competitive Internet access market and safeguard consumer interests, while at the same time provide sufficient flexibility for ISPs or telecom network operators to differentiate their business models, services and products, or perform network management.

23. Firstly, IDA believes that a competitive Internet access market will reduce the incentives for ISPs and telecom network operators to engage in blocking or discriminatory conduct that restricts consumer choice in terms of the content, services and applications they can access over the Internet. As can be seen by the new high-speed Internet access service offerings launched by players like SuperInternet and LGA, the deployment of the Next Gen NBN has lowered entry barriers for ISPs and intensified competition in the Internet access market. In addition, IDA's Telecom Competition Code ("TCC") serves to promote and preserve the competitiveness of the Internet access market via competition and interconnection rules:

(i) ***Competition framework***: IDA's competition rules in the TCC Sections 8 and 9 promote and preserve effective competition in the Internet access market, which will ensure that end users who find certain ISP's service restrictive or limiting will have the choice to switch to another provider. These competition rules guard against discriminatory practices by service providers with significant market power, unfair practices or collusion that harm consumer interests and competition, as illustrated in the examples in paragraph 8.

(ii) ***Interconnection framework***: The policy of encouraging an 'open and interconnected' telecom network is enshrined in IDA's TCC Section 5, which mandates interconnection between telecom licensees and prohibits a telecom licensee from degrading another licensee's telecom service without legitimate justifications.

24. The second prong focuses on improving information transparency for consumers. While a competitive market, in theory, should bring about a wide variety of service choices and lower prices to benefit consumers, these will benefit the consumers only if they have clear and transparent information of the service and price offerings fully disclosed to them upfront, to allow them to make an informed choice. Hence, to help consumers navigate the variety of Internet broadband service choices in the market, IDA currently publishes 'A Guide To Residential Broadband in Singapore'[14] which covers comparisons of Internet broadband service prices and performance (in terms of data throughput and latency). In relation to net neutrality, while IDA recognises that network management practices can improve overall Internet service quality for end-users, IDA believes that such practices must be made transparent (i.e. fully disclosed upfront) to consumers so that they can better understand the network management practices of the ISPs when deciding their choice of ISP. Thus, IDA currently also requires ISPs providing fixed-line Internet access services to residential users to publish information on their network management practices[15]. The publication of the network management information must cover the types of network management activities, why and how the network management activities are carried out, the type of Internet traffic that is impacted by the network management activities, as well as specify when the network management activities are carried out and how the consumer's Internet usage experience will be affected.

25. The last prong seeks to protect consumer interests by ensuring that fierce competition in the market does not lead to ISPs or telecom network operators degrading the Internet access service quality to end-users, in their bid to compete on price or to lower cost. IDA is one of the few regulators in the world to impose

[14] This is available at: http://www.ida.gov.sg/Publications/20061213184450.aspx#performance

QoS requirements on fixed-line broadband and publishes the ISPs' QoS performances regularly[16]. The QoS standards mandate an average 99.9% network availability (which measures the degree to which the ISPs' networks must be operable and not in a state of failure), as well as average latency of below 50 millisecond for local network access and below 300 millisecond for international network access (these measure the time taken to access local Internet content and Internet content sited in the US, respectively). In addition, IDA also monitors the data throughput performances of the ISPs, which refers to the amount of Internet data that is successfully transferred over the ISPs' networks. These QoS requirements ensure that end-users enjoy a reasonable quality of Internet access.

26. Given the healthy developments in the local Internet access market thus far, and the increasing levels of competition brought about by new broadband services over the Next Gen NBN, IDA believes that the policy and regulatory frameworks above have served to facilitate consumer choice while providing sufficient flexibility for ISPs, telecom network operators and Internet companies to spur value and innovation creation on the Internet. Nonetheless, IDA would like to reiterate that IDA does not condone blocking or discriminatory treatment of legitimate Internet content. Consumers who have subscribed to an Internet access service must be able to access all legitimate content on the Internet, at a reasonable QoS level.

27. In summary, IDA's policy approach towards net neutrality is:

No blocking of legitimate Internet content	• ISPs and telecom network operators are prohibited from blocking legitimate Internet content
Comply with Competition & Interconnection Rules	• ISPs and telecom network operators must comply with IDA's competition and interconnection rules in the TCC

[15] The ISPs' publications can be found at: http://www.ida.gov.sg/Publications/20090602161114.aspx

[16] The QoS requirements are imposed on ISPs (serving residential and/or business customers) with more than 10% of the market share, and the detailed requirements can be found at: http://www.ida.gov.sg/doc/Policies%20and%20Regulation/Policies_and_Regulation_Level2/20060424141236/Qos_webpage_bb.pdf. The publication of the ISPs' QoS performances can be found at: http://www.ida.gov.sg/Policies%20and%20Regulation/20060424142032.aspx

Provide Information Transparency	• ISPs and telecom network operators must comply with IDA's information transparency requirement and disclose to end-users their network management practices
Meet Minimum QoS standards	• ISPs must meet the minimum broadband QoS standards to ensure a reasonable broadband Internet experience for end-users • Reasonable network management practices are allowed provided the minimum broadband QoS are adhered to
Niche or differentiated Internet services allowed	• ISPs and telecom network operators are allowed to offer niche or differentiated Internet service offerings that meet IDA's interconnection, information transparency, minimum QoS and fair competition requirements.

IDA believes that the above policy position will continue to facilitate consumers' access to content and services on the Internet, while providing flexibility for ISPs, telecom network operators and Internet companies and content providers to differentiate their services for economic efficiencies and innovation. The type of niche or differentiated Internet services offered by ISPs or telecom network operators may include 'managed'-type of Internet access services that provide higher QoS in terms of guaranteed bandwidth, latency, etc, or a special application like online medical consultation service bundled with the Internet access service. Such services will help bring about greater consumer choice and a more vibrant Internet access market.

Proposed Enhancements

28. Building on the measures mentioned above that IDA has already put in place, IDA has also considered enhancements of the three pronged framework for net neutrality – increasing the competitiveness of the broadband market, increasing information transparency to consumers, and ensuring a reasonable internet access experience for consumers.

29. One regulatory enhancement that IDA is considering is in improving information transparency on Internet access speeds. IDA has observed that most

ISPs advertise the theoretical maximum broadband access speeds for their Internet access service packages, which may not be usually achievable under normal Internet surfing conditions when there are multiple users accessing the ISPs' Internet networks. Some consumers who sign up for such Internet broadband access services may find that the actual Internet access speed they can obtain do not meet their expectations and fulfil their Internet surfing needs.

30. IDA proposes that ISPs, whether providing fixed-line or mobile Internet access services, should inform customers of the *expected average* Internet access speed achievable for their Internet broadband services, on top of the theoretical maximum access speed. This will provide added transparency to end-users with respect to the Internet access speeds they can expect, further aid them in their choice of Internet access service, and minimise disputes. The additional information could take the form of 'average Internet access speed' (for example, the average of Internet access speeds experienced by end-users in the past month) or 'expected Internet access speed' (for example, the average Internet access speed that the end-user can expect to experience under normal surfing conditions).

31. IDA will also continue to monitor developments in the Internet access service market, including new network management practices that may be deployed by ISPs or telecom network operators, the types of service differentiation that ISPs or telecom network operators offer to consumers and Internet companies/content providers, as well as net neutrality-related regulatory developments in overseas jurisdictions, to assess if further enhancements to IDA's regulatory frameworks are required. IDA will seek further comments and inputs from relevant stakeholders on the proposed requirements and implementation details before IDA decides on enhanced regulatory requirements.

PART V: INVITATION TO COMMENT

32. IDA would like to invite feedback and comments from the industry and consumers on:

(i) Current state of net neutrality developments in the local Internet access service market;

(ii) Possible developments in net neutrality in the future;

(iii) IDA's policy approach towards net neutrality; and

(iv) IDA's proposal to improve information transparency on the actual or expected Internet access speeds, and issues to consider including potential benefits for consumers, impact on ISPs and the development of the Internet access market, and the extent of information that should be made available.

PART VI: PROCEDURES AND TIMEFRAME FOR SUBMITTING COMMENTS

33. All views and comments should be submitted in writing and sent to IDA by fax or in soft copy (Microsoft Word Format). Submissions should reach IDA by **5.00pm, 16 December 2010**. Respondents are required to include their personal or company particulars, correspondence address, contact number and email address in their submissions. IDA will make all or parts of any submissions made in response to this consultation paper public and disclose the identity of the source. Any part of the submission which is considered commercially sensitive must be clearly marked and placed as an annex to the comments raised. IDA will take this into account in its review. All comments should be addressed to:

Aileen Chia (Ms)
Deputy Director-General (Telecoms & Post)
Infocomm Development Authority of Singapore
8 Temasek Boulevard
#14-00 Suntec Tower Three
Singapore 038988

Fax: (65) 6211 2116

AND

Please submit your soft copies via email to IDA_consultation@ida.gov.sg