CISCO SUBMISSION TO
INFO-COMMUNICATIONS DEVELOPMENT AUTHORITY OF SINGAPORE
CONSULTATION ON NET NEUTRALITY

Cisco Systems is the world's largest manufacturer of networking equipment and a market leader in the provision of network management solutions and applications that require appropriate network management. It is also a leader in the development of managed Internet protocol products and solutions used by individuals and enterprises throughout the world. Cisco welcomes the opportunity to provide comments in the context of the Net Neutrality consultation published by the Info-communications Development Authority of Singapore ("IDA") on 11 November 2010 ("Consultation Paper").

The "net neutrality" debate that started in the United States in 2005 has evolved from a simplified slogan to a more sophisticated, nuanced and important discussion of how to maintain the principles of an open Internet while meeting the needs to manage networks in the face of dramatically growing demands on those networks from a wide range of bandwidth-hungry applications that have widely differing characteristics. The ultimate goal is to maintain an open Internet and permit networks to be adaptively managed to optimize the needs of different subscribers and applications without jeopardizing consumer protection or competition.

As a company, Cisco has long supported an open and innovative Internet and continues to do so. Many of the Internet's benefits come from its open nature and the ability of anyone to develop new and innovative devices and services that connect to it. Such innovation has created entirely new industries and has fostered competitive markets in Internet applications and equipment. Recognizing these advantages, Cisco helped produce the High Tech Broadband Coalition's "Connectivity Principles" in 2003, which were reflected in the FCC's Policy Statement of 2005 as cited in paragraph 12 of the Consultation Paper.

Cisco fully embraces IDA's policy approach as outlined in the Consultation Paper, and the provisions to enhance consumer transparency, which we believe protect consumers from arbitrary and unnecessary limitations on Internet usage. We believe an open and competitive Internet must include the ability of network operators to innovate within the Internet, and so it must permit both network management and managed services (such as high definition video conferencing like TelePresence or HealthPresence) to offer consumers additional choice through tiering, quality of service, security services and other network management techniques.

Evolution of Applications

As noted in paragraph 3 of the Consultation Paper, Cisco's Visual Networking Index ("VNI") forecasted global Internet traffic to quadruple from 2009 to 2014. This dramatic growth will come from a range of applications and services, driven by video, that have different requirements. Some will need high-speed download capacity that is not time sensitive. Others will use high bandwidth one-way streaming in which latency is a factor. Other applications, such as VoIP, will not require high bandwidth but will be symmetric and need very low latency. And some, like TelePresence and other high definition real time two-way video, will require very high symmetric bandwidth, low latency and minimal jitter. In other words, different applications will require differing network requirements, and as a result, the optimal network will need to be adaptable to be "fit for purpose".

The Internet must be an intelligent network that is capable of delivering information to the right place at the right time with the right quality of service while preventing harmful and unwanted information from being delivered. This requires a balanced regulatory approach rather than an oversimplified slogan.

Evolution of the Internet

There is already an evolution of the Internet that has taken place over the past few years allowing for new service models, and is a significant change from the original 'best effort' service model. This is, for example, about ensuring streamed audio and video, or real time bidirectional voice and video, achieve a proper performance level. To do so, all packets are not treated equally because different applications require differing network requirements.

In future, this evolution should continue. Managed and specialized services, which today are mainly offered via private networks and as enterprise managed services or specialized services outside the Internet, could also be offered over the Internet, and the evolution of the Internet should allow for these new services to emerge for the benefit of consumers. From the consumer perspective, a managed service will be a separate service from the "best-effort" Internet service.

Evolution of Competition

Generally speaking, we believe competitive broadband markets, both retail and wholesale, are the best way to protect everyone's interests and diminish the incentives for potentially unfair discrimination. If customers have a wide choice of Internet service providers, are well informed about the characteristics of their broadband plans, and are able to switch between providers without penalty subject to their contracts, the potential for unfair discrimination or traffic management resulting in consumer harm is substantially mitigated.

A provider found to be engaging in traffic degradation, blocking or other negative behaviour for anti-competitive reasons would quickly lose customers to its competitors. This competitive pressure has been extremely effective in ensuring that providers comply with the preferences of their users – and there is no reason to doubt that it will continue to be effective in the future.

Clearly, operators should not be allowed to block or degrade any lawful traffic in a way that harms competition or consumers. However, they should be allowed to offer differentiated services and additional choices to consumers. Traffic and network management can be a legitimate tool for the provision of differentiated services and in the interest of the efficient functioning of networks. Service providers already offer various broadband plans at different prices depending on the broadband speeds, monthly usage, etc. In the future, new business models will emerge and services will address to specific needs (e.g. in a specialized video streaming on gaming console service or Connected TV with 3D content or specialized delay-sensitive services such as healthpresence at home). Varying pricing conditions may be launched for the benefit of consumers and citizens who are willing to pay for them.

If, despite the existence of dynamic and competitive broadband markets, there were instances of unfair discrimination causing harm to consumers or competition, IDA's dispute resolution framework and Singapore's overall competition regime is capable of dealing with any such issues. It is important to ensure that the Internet remains open and that consumers can access any legal content and applications.

Policy and Regulatory Approach

Cisco believes that the following are the essential components of a balanced policy and regulatory approach that fosters both an open Internet and a well-managed network:

Consumer Protection. First, there needs to be basic principles to protect consumers from arbitrary and unnecessary limitations on their Internet usage. Cisco supports an open Internet where consumers can, within their contracted service plans (i.e. bandwidth and quality of services) have access to their choice of legal Internet content, be able to run applications of their choice, attach any device they choose to their broadband internet access, and receive meaningful information regarding their broadband Internet access plans. The transparency of plan information and ability to determine if the terms of a plan are being met, are critically important tools.

Managing Fit-For-Purpose Networks. In addition to protecting consumers and competition, it is also essential that service providers can effectively manage networks. The massive growth in data, latency, symmetry and other requirements indicated by the VNI studies leads to the need for more sophisticated and adaptive network management. Relying on capacity alone to solve bandwidth and service characteristic limitations would impose large and uneconomic costs, particularly on low volume end users. Just as networks ranging from traditional telephone networks, electric grids and water supply systems are built to avoid peak load problems to prevent uneconomic investment and costs, broadband networks need to be designed to balance demand and provide the best possible performance to the largest number of subscribers at affordable prices. Shaping traffic in this way can avoid building networks for peak loads, which can impose unnecessary and burdensome costs on consumers, especially when more cost effective approaches are available. Fortunately, such tools are even more readily available for providing broadband than even some of the traditional network industries. However, service providers must be permitted to engage in basic traffic shaping and network management to reap the benefit of a more cost effective broadband infrastructure. Service providers also need to manage their networks for other fundamental, pro-consumer and pro-societal reasons. For example, service providers manage packets to maintain network security, control the proliferation of spam, spyware, worms and other malware, and to provide parents, schools and other public Internet access points appropriate controls over content accessed by children.

Quality of Service. Managing networks for quality of service is becoming increasingly important. As noted above, different applications have different characteristics and place different demands on networks. In the past, consumers were running applications such as web browsing and email that tolerated delay and jitter and were not viewed as “mission critical”. However, a growing set of consumer and business applications that offer great value to individuals and society and can even be life saving, are very sensitive to network characteristics such as latency and jitter. Applications such as telemedicine, emergency alerts and real-time energy management are examples of such new technologies. For these applications, it is absolutely necessary that the correct packets arrive at their destination at the correct time. Quality of service matters for mission-critical applications and networks have to be able to manage for these needs.

Managed Services. One of the growing trends in new service development for both business and consumers are managed services. These services range from virtual private networks to specialized network services for specific industries such as healthcare, smart buildings, collaboration, and government services. Providing these services requires the ability to manage networks to meet the specialized needs and functions of each specific service offering. For example, a home healthcare system may only be viable if the data is connected to a healthcare facility through a managed service

to ensure data integrity and effective service. As more critical activities occur across the Internet, the need for managed services will only grow.

Business Models. As the broadband Internet evolves and new commercial services are developed at the same time traditional "brick and mortar" offerings migrate online, new business models are evolving and being assessed for economic viability that both attract investment and keep services affordable. The future business models for broadband Internet are still evolving and being tested. It is not entirely clear that the single-sided "subscriber pays a flat rate" model is always in the best interests of consumers. Advertising, for example, has supported free-to-air broadcast television where consumers do not pay a fee to watch TV. Even some "pay" television services use a blend of subscriber payment and advertising. The "free phone", "800" service, two-sided market for toll calls to business have been used effectively around the world to lower consumers' cost while allowing them to transact business with companies. These types of "cost sharing" reduce costs to consumers, increase consumption of communications service and benefits all parties. These types of new business models that could lower broadband costs and increase adoption and use should be encouraged, not discouraged, as some proponents of regulation have argued.

An open Internet where consumers can access all legal content and applications is universally supported. Likewise, anti-competitive behaviour by Internet service and application providers can be addressed through competition law. Effectively managing networks is an essential part of a well-functioning open Internet. All regulation has costs and benefits. The key is to weigh the costs and benefits and ensure that the latter outweigh the former. Where there are existing regulatory and policy regimes, the cost of regulation should be weighed carefully against the expected benefits.

IDA's Proposal on Transparency

With specific reference to IDA's proposal for Internet service providers to inform customers of the expected average Internet access speed achievable for their Internet broadband services in addition to the theoretical maximum speed, Cisco fully endorses the proposal. Cisco supports the transparent provision of information, including providing actual download and upload speeds, both for local and international connections. Beyond speed, other quality parameters such as latency for various service offerings may also be useful information for the consumer.

The key factor is that the information should be meaningful, and not overload consumers with too much data that it does not help in their decisions and choices. The information should also not be so detailed as to be burdensome to the service providers. It is important that the outcome of providing such transparent information does not lead to encouraging all service providers to offer services in the same way. Otherwise, this will be detrimental to consumer choice and innovation.

Looking Ahead

Cisco, as a global leader in networking and Internet technology would welcome further opportunities to work closely with IDA on the policy and regulatory issues relating to net neutrality. Cisco's goal and objective is to provide ubiquitous affordable and real broadband everywhere so that everyone can benefit from it. These objectives are closely aligned with most governments and policy makers.

We look forward to be further engaged in future consultations of the Singapore government. Further queries regarding this submission may be directed to Goh Seow Hiong (shgoh@cisco.com) or Jeff Moon (moonj@cisco.com) of Cisco Systems.