EXECUTIVE SUMMARY

In this paper, Seaboard Group takes the position that Net neutrality advocates romanticize the Internet, bringing in emotional and even sensationalist rhetoric to their portrayal of its history and future. Treating the Internet as some sort of pastoral elysium rather than a tool to be managed and used, we argue, would have dire consequences for the future health of the Internet should legislators/regulators attempt to embrace these misguided notions.

This paper will illustrate why the romanticized version of the Internet is faulty. We suggest that such a vision is based on false precepts, and how the regulations being called for by advocates of Net neutrality, if put in place, will impede the growth, potency and relevance of the Internet in the future.

Seaboard Group advocates simply that the Internet be recognized for what it is and treated as such. The Internet is a tool. It is a tool of increasing importance to many and its ubiquity is growing but it remains essentially a tool.

Our conclusion is that the government should forbear from overt regulation of the Internet. Let market forces, coupled with existing legislation and regulation that safeguards consumer and corporate interests, continue to shape the Internet. In so doing, private capital investing in network provision and expansion will be rewarded. Operators that make the investments needed to continue to increase the quality of the product and enhance the user experience will also be rewarded. On the other hand, operators who invest too little and
‘shape’ traffic too much will find themselves with a dissatisfied and shrinking user base and diminished customer spending.

The ideal role for government is to be gentle in its attempt to husband the online environment. Our advice? Speak softly, and if there must be a stick, make it a small one. We might also suggest that it also carry some carrots – should the urge strike - to encourage specific innovation (like remote area access). A modicum of encouragement might well work more miracles than the threat of sanction.
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INTRODUCTION

This paper focuses on the current debate in communications and government circles on the growth of the Internet and the potentially conflicting implications of that growth on the private interests that largely fund Internet facilities. This paper also focuses on the interests of the users of Internet services - a group increasingly synonymous with the general voting public, whose enthusiasm for the topic is fueling political involvement.

The (somewhat pejorative) term for this debate is “Net neutrality”.

For the majority of its advocates, the allure of Net neutrality lies in its Utopian flavour.

Though lacking a precise definition, the concept is widely accepted to mean that all content flowing through the network be treated equally, regardless of user, application or destination - the equivalent of social justice for the packet.

As Internet traffic congestion increases, various advocates argue that Internet service providers (ISPs) must treat all traffic with neutrality. They argue that the various forms of traffic management practices that violate this non-discrimination principle must be curtailed.

SeaBoard Group argues conversely that, despite any noble intentions, packet equality does not make for a better Internet. Indeed, without some form of congestion management, the Internet will become a much less useful tool.

We assert that a neutral Net would produce an inevitable increase in congestion. ISPs would be forced to increase investment in service provisioning without the ability to segment user charge by type of traffic, or even, in the minds of some, by usage. Mandating Net neutrality will have the perverse effect of undermining the vitality of the Internet. ISPs would be prevented from managing the ever-growing traffic, thereby effectively eroding the network’s value to the user:
Given society’s growing appetite for bandwidth-intensive applications/platforms and correlate increase in bandwidth scarcity, binding ISPs from network management practices is both counter-intuitive and impracticable. Counter-intuitive because it erodes the network value of the Internet. Impracticable because it is economically unsustainable.

Society has considerable experience with traffic management – in the skies, on the highways and in the streets. We have collectively found ways to allow many different types of users to share common resources. SeaBoard Group contends that traffic management practices are essential to a functioning and sustainable Internet too. A managed resource will benefit all stakeholders; ISPs, applications & content providers and users.

This paper is organized as follows. Section I will briefly outline the evolutionary history of the Internet. Section II examines Internet demand in terms of Internet traffic and capacity growth. Section III introduces the concept of Net neutrality and its proposed mandate. Sections IV and V detail key arguments against a Net neutrality mandate based largely on its detrimental economic and network value effects. Section VI argues against Net neutrality in Canada from a legal perspective while conclusions are made in the final section.
INTERNET: DEFINITION & EVOLUTION

This section will provide a definition and a brief evolutionary history of the Internet with the intent to highlight the following three points:

i. The Internet is a tool that evolved out of utilitarian objectives. These objectives involved interconnecting computer networks in a way that could survive potentially hostile military environments;

ii. Though the negative impact of packet traffic congestion was obvious during the initial phases of ARPA’s Transmission Control Protocol/Internet Protocol (TCP/IP), possible solutions were deferred until the problem (thought to be ‘years’ away) was realized; and

iii. Although initially publicly-funded, the private sector has been integral to the development and growth of the Internet. Private risk-bearing investment has facilitated expansion of Internet capacity and access numerous times over the course of its evolution and fueled its explosive growth since the mid-1980s.

The Internet is a tool, designed by government network engineers motivated by utilitarian objectives, enabling the interconnections of multiple computer networks that would otherwise function in isolation.¹ The genesis of the Internet has however become shrouded in Utopian² mystique and many myths now surround its inception. The network has come to be seen by many as some sort of electronic frontier, a libertarian paradise – the perception that the Internet is now something more than some engineering protocols and optical plumbing has captured the imaginations of many. The following two quotations are representative of what the Internet has become to some of its users:

*We all see the Internet as a place of freedom, where new technologies, business innovation and competition flourish. This*

¹ By convention, internet refers to interconnected networks (or capability) in general, while an upper case “I” denotes the archtypical Internet, the network of networks.

² Thomas More’s Utopia is a discourse on what More felt would be a perfect society based on a fictional island. More’s work is more a satire on 16th century Europe than a prescription for perfection, but the notion of Utopia and perfection persists.
freedom has always been at the heart of what the Internet community and its original innovators celebrated.\(^3\)

From its inception, the Internet was designed, as those present during the course of its creation will tell you, to prevent government or a corporation or anyone else from controlling it. It was designed to defeat discrimination against users, ideas and technologies.\(^4\)

In fact, the Internet was born out of the U.S. Department of Defense Advanced Research Projects Agency’s (ARPA) efforts in the 1960’s. With a mission to connect existing computer networks that differed both architecturally and technologically, their foremost priority was survivability in a military context. Despite the now-prevailing rhetoric - samples of which are provided in the above quotes - political or social attributes were not part of any of the late 1960’s design considerations.

ARPA’s team of computer scientists experimented with applying packet-switching techniques to communications challenges. Packet switching, which entails the disassembly of information into smaller size data “packets” that are then forwarded through a series of routers and reassembled at the recipient computer, differed from the traditional circuit-switch telephone networks in that a dedicated line was no longer required for the duration of each communication. Each packet is a stand-alone entity. Each packet contains source, destination and reassembly information which was dispersed amongst multiple paths before being reassembled at its destination. Packet switching, in its infancy in the late 1960s and early 1970s, took off with ARPA’s work on transmission protocols.

Interconnection between different networks was achieved in the mid-1970s with the emergence of ARPA’s Transmission Control


Protocol/Internet Protocol (TCP/IP) software suite and gateway interface devices. TCP/IP allowed different networks to communicate with each other through a standardization of packet lengths and payloads, and through definition of standard switching/routing protocols.

ARPA’s TCP/IP-based Internet worked -- but it wasn’t without a few hitches. It became clear during initial stages of implementation that the resulting “first-in-first-out” (FIFO) and “best efforts” methods of data transmission were negatively affected by congestion – the network would be the victim of its own success. As more users were added, and as the packet volume rose, network performance would be impaired. When a packet arrived at a router through one of its several incoming links, an algorithm at that router would determine through which of its numerous outgoing links the packet should be sent. If that particular outgoing link was busy, the newly arrived packet would be held in a queue or “buffered” in the router’s memory until the assigned link became free. But during periods of congestion, the buffered packets would be rerouted or dropped. In asymmetric communications the dropped packet could be replaced by a request generated from the receiving end for a retransmission of the missing data. This solution added its own overhead to an already congested network, thereby congesting the network further, but it did protect the integrity of the data. In symmetric communications (i.e. telephone conversations) the penalty for missing information is far greater and the opportunity to request/send missing information isn’t possible. As the network grows in size and volume, then it is increasingly difficult to ensure end-to-end communications quality-of-service levels without some sort of traffic differentiation.

In spite of the challenges however, TCP/IP protocol became widely adopted and implemented. The applicability of packet switching to the emerging email traffic demand was compelling, and the advantages of a network of networks to achieve ubiquity in communications led the U.S. government to promote TCP/IP’s acceptance. In the mid 1980s, the U.S. National Science Foundation (NSF) embarked on network expansion plans to connect universities and researchers with private sector
investors. The NSF wanted to capitalize on the increasingly obvious benefits to U.S. research and competitiveness of interconnected computer communication networks. By 1992, NSFNET traffic volume was near capacity and given limited NSF resources, private sector investment was sought for network expansion. As a result, private interests created a non-profit -- Advanced Networks and Services (ANS) -- that built a new backbone with thirty times more capacity. Notably, for the first time, principal ownership of the backbone was private rather than government held.

 Concurrently, the number of privately-owned networks climbed steadily with the establishment of the Commercial Internet Exchange (CIX) in 1991. Formed as a response by several private commercial backbone operators to NSFNET’s restrictions on its own backbone usage\(^5\), CIX members interconnected their own backbones to exchange commercial data traffic with each other. Eventually, by 1995, this growing network of commercial backbones replaced the NSFNET, in essence, privatizing the Internet.

Currently, the Internet’s thousands of disparate global networks are generally owned and managed by various private organizations. It is this loose confederation of private interests that has invested funds and resources that can be credited with the Internet’s explosive growth since the mid 1990s.

Despite periodic upgrades to TCP/IP since its launch, the problem of network congestion that had largely been deferred since TCP/IP’s early days now looms large as debate ensues over the implications of that past and present on the Internet’s future development.

\(^5\) NSFNET’s Acceptable Use Policy prohibited its backbone usage for purposes other than research and education.
As traffic on the Internet builds, network performance degrades. This impact of network congestion on Internet performance has long been recognized and significant investments have been made to increase Internet capacity and capability in order to ward off congestion problems. It is vital that these measures continue in the future as the Internet has experienced significant growth in both the number of end-users and uses since the early days of TCP/IP.

Though long considered a tool for the world’s privileged, development initiatives are bringing Internet access to a much wider population, significantly increasing the overall number of Internet users world-wide. Globally, the number of current Internet users has grown to 1.4 billion. SeaBoard Group predicts a further increase of another 200 million in the next 18 months.

Concurrently, new uses of the Internet are growing in popularity. No longer are people satisfied using the Internet for simple emailing and file transfers. With an ever expanding array of new technologies, devices, content and applications available almost daily, global users are using the Internet to entertain themselves, communicate with others, and conduct business on local and international scales.

Three major contributors to rising Internet demand have been identified as:

1. **Internet’s emerging role as an entertainment platform**
   Bandwidth hungry applications like YouTube (video streaming) and BitTorrent (peer-2-peer multimedia downloading) are surging in popularity. YouTube alone comprised of 7% of total U.S. Internet traffic, or equivalently 600 Petabytes (PB), by mid-2007 and is

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7 PB = Petabytes, 2^50 bytes; 1, 000, 000 Gigabytes
predicted to grow by 12 Exabytes\(^8\) (EB) per year when YouTube starts to offer high definition (HD) content. Additionally, we have yet to see the full impact on Internet traffic growth of widespread IPTV applications that require capacity over the last mile to be expanded.

2. **Global Sensorium**
   Driven by the growing popularity of images generated from mobile camera phones and surveillance video with IP addresses. These are increasingly becoming large consumers of Internet traffic.

3. **Diminishing Importance of Local Area Networks (LAN)**
   LAN’s importance is diminishing relative to metro and wide area networks (MANs & WANs) as businesses increasingly seek to have their applications and proprietary data stored at a collection point by an outside party.

These drivers of Internet demand are also drivers of growing bandwidth consumption, or IP traffic growth. As the applications and content continue to evolve, applications become more pervasive and useful, and content more comprehensive. This phenomenon leads to increased reliance on interactive systems. As the world increases its reliance, the net effect on bandwidth demand is growth. With the numbers of users growing steadily and the number of uses for the Internet growing rapidly, global packet traffic is experiencing double digit growth. In fact, since 2004, annual average traffic growth\(^9\) was 104%, 50%, 74% and 57% each year from 2004 to 2007.

The following forecast takes these growth trends and demand drivers into account.

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\(^8\) EB = Exabytes, \(2^{60}\) bytes; 1, 000, 000, 000 Gigabytes

\(^9\) PriMetrics/Telegeography (2007)
Using 2003 as a base year, the exhibit illustrates the growth in Internet traffic over 2004-2007, and projects that growth trend through 2010. It shows that the magnitude of Internet traffic in 2007 is 8.4 times greater than the traffic in 2003. The forecast\textsuperscript{10}, shows that by year 2010 global Internet traffic will grow 17.6 times over the 2003 baseline, and will be over twice the 2007 value by the end of 2010.

The growing number of global Internet users and uses for the Internet all contribute to the growth of global IP traffic. Complementary bandwidth hungry applications further intensify global IP traffic growth. SeaBoard Group forecasts that that by 2010 global Internet traffic will grow 17.6 times over 2003 and will be over twice the 2007 value.

\textsuperscript{10} the data are based on average traffic demand, mid-year
Thus, Exhibit 2 suggests a similar growth path for global Internet capacity. It is clear that global capacity has been growing apace however not quite in-step with demand over 2004-2007; demand grew by a factor of 8.4, while capacity grew by only 5x. The disproportionate capacity growth pattern can be ascribed to the existence of capacity left over from the halcyon days of the early 2000s. However, much of that capacity has been absorbed by the growth of demand in succeeding years and capacity is now poised to grow once again.

The Canadian Market

IP traffic growth in Canada reflects international trends. Internet access revenues can be used to approximate the overall growth in Internet usage. In Canada, revenues show double digit growth: 18%, 11%, 12% and 14% between 2003-2006. Forecasts suggest growth at similar rates through 2010.

In 2006, 70% (8.7M) of all Canadian households subscribed to residential Internet access services. 7.5 million households, or 60% of all Canadian households, subscribed to high-speed Internet
access, up 51% from the previous year. It can be argued that Internet demand and IP traffic growth will plateau with broadband penetration, however, this argument fails to take into consideration the likely intensity of the next wave of Internet demand growth. This next wave will be fueled by end-user demand for bandwidth as society becomes increasingly “Net” dependent and will place huge burdens on bandwidth capacity. Exhibit 3 below shows the impact of several types of applications on the demands of service provider infrastructure.

**Exhibit 3**

Changes in Network Demand/Bandwidth Dynamics over Time

*Source: SeaBoard Group, 2008*

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Exhibit 3 illustrates how network load and transaction size for the various Internet uses have been growing in size over time. The lowest volume, and a continuing baseline of demand, is represented by text-based email and messaging (including instant messaging). Early uses of Internet systems like email and messaging continues today, but are not bandwidth-intensive. The moderate amount of bandwidth consumption growth associated with email can be attributed to the fact that today's typical emails contain graphic elements, document attachments and/or pictures. A typical email in the early part of the decade was 1-3 kb in size. Today's typical email, however, can contain graphic elements, document attachments and/or pictures. As a result, emails have grown from their text-based antecedents, typically 1-3 kb, to 2-5 MB message containers.

Although email and messaging are not major contributors to the exponential growth in bandwidth demand, other forms of Internet activity such as video messages, music and movie downloads increase the demand for bandwidth as Internet-enabled television becomes more standard. The advent of HD television and movie downloads will further contribute to the demand for bandwidth.

Another primary driver of Canadian Internet growth has been household personal computer (PC) penetration since without a PC (before smart phones/PDAs), there would be no terminal to display information and no way to communicate customer requirements to the network. Exhibit 4 shows that personal computers were in 3/4s of households by the end of 2006. It also shows that 95% of those devices were connected to the Internet.
Though PCs remain a significant part of the consumer and business Internet demand equation, the next phase of Canadian Internet growth will be driven by the oncoming wave of Internet access devices that are mobile (the Apple iPhone is an iconic example) and IP-enabled television sets that will give consumers access to vast libraries of video (and high definition) content on demand. Many of these devices will include PC-like processing capabilities but none will be defined by their host networks as PCs.

Enterprise users (including governments) also contribute a sizable share to IP traffic growth. Exhibit 5 below, illustrates typical carrier traffic mix in 2008. SeaBoard Group’s forecast of the traffic mix in 2010 is also given. Note that although the forecasts indicate that business traffic decreases to 21% from 27% in 2008, this is a relative change. The absolute magnitude of business traffic will increase by a factor of 1.8 over the same time frame.
Motivated both by time-cost savings and by maximizing the competitive advantage that communications applications investment can provide, enterprise users are continuing to invest more resources in various corporate collaboration tools like unified communications (UC), telecom-enabled just-in-time (JIT) systems, Software as a Service (SaaS) and cloud computing. Consequently, as firms become more dependent on such bandwidth intensive technologies, demand on networks will also intensify.

Redundancy regulations and 24/7 uptime commitments further contribute to network traffic volume as more resources are required to be allocated to increases in bandwidth and networked storage facilities. Recent reports cite the rapid growth in demand for enterprise storage in the last five years despite price decreases of approximately 20% year over year. Forecasts suggest enterprise storage demand will reach 20,000 PB by 2011 - a substantial increase of nearly 18,000 PB in only four years.

Internet traffic is increasing, driven by growth in end-users and uses for the Net. Increases in capacity have not been keeping pace.

Exhibit 5
Consumer vs. Business Traffic Mix

Source: SeaBoard Group, 2008
Given that investments in infrastructure and technologies are needed to accommodate this rising demand for capacity, mandating neutral conditions (thereby lessening the potential for reward for risk capital) is counterintuitive. Without large scale infrastructure growth and an effort to manage growing traffic, the Internet will become incapacitated. The creation of policies that will slow investment in infrastructure and disallow traffic management will have dire consequences for the future of Internet service. These policies and their consequences will be examined in the next section.
III    PRESERVING NET NEUTRALITY

While there is not a widely accepted definition, the concept of Net neutrality is held to mean that all content flowing through network pipes, regardless of user, application or destination not be discriminated against - the equivalent of social justice for the packet. For the majority of its advocates, it is this democratic flavour that is the allure of Net neutrality.

Advocates argue that neutrality conditions must be mandated. They contend that mandated neutrality is the only way that user’s interests can be safeguarded from the (conflicting) interests of service providers. Net neutrality advocates hold that as the congestion problem intensifies (as more users are connected and as each user increases his/her consumption of the resource), ISPs will engage (and are engaging) in various forms of traffic management that violate this sacred nondiscrimination principle. Net neutrality advocates warn of various potential abuses that they hold likely to occur in the absence of any government regulation. They hold that government has a duty to preserve the neutrality of the Internet and user interests.

A cornerstone of Net neutralist concern is the potential of ISP anti-competitive behaviour. Net Neutralists are concerned that ISP vertical integration, a convergence of carriage with application and content delivery, might tempt the ISP to block or degrade performance of competing services.

We contend that such anti-competitive behaviour on the part of ISPs would be highly self-destructive given a workably competitive market. In the case of Canada’s broadband services provision marketplace, the 60/40 market split between cable and DSL suggests workable competition exists in Canada. Furthermore, the advent of wireless alternatives, with HSPA in the PCS and AWS

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12 “... encompasses a broad set of rivalrous actions that results in outcomes similar to those predicted from traditional economic models of imperfect competition” as defined by the Fraser Institute’s Steve Globerman (2008). http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2007/tmr2007.pdf
bands (after the latest auction) and the forthcoming 700 MHz spectrum auction in 18 months, suggests that there will be robust competition at the access level. With cable, DSL, fibre and now, various flavours of wireless broadband from a handful of new providers, the choice is broadening for Canadian subscribers.

Neutralists also express concern about “stifling.” They contend that in the absence of a neutrality mandate, discrimination or prioritization will impact innovations at the “edge” of the Net and will stifle user creativity. They warn that developers of applications and content will be discouraged from pursuing such projects due to the increased risks and uncertainty of possible discrimination of their innovation by ISPs.

It is SeaBoard’s contention, however, that it is conversely the concept of Net neutrality that is detrimental to the growth of innovation at the network edge. Without a mechanism to allocate bandwidth and introduce prioritization, the burgeoning growth of network traffic will stifle application innovation and adoption. Many recent web-based innovations require data discrimination (prioritization) in order to operate at a dependable level. Innovations such as voice over IP (VoIP), video streaming, online gaming and real-time teleconferencing, are growing and each, in its way, place new demands on the Internet fabric. Some applications are bandwidth-intensive, but not time-sensitive, some are time-sensitive and react poorly to network latency, but occupy little bandwidth; both conditions therefore require data prioritization to achieve acceptable user usage environments.

Indeed, a prime source of Internet-related innovation has been in network management and traffic shaping tools. The ever increasing flow of data and the growing demands on necessarily finite connectivity paths creates an ideal innovate climate. Legislating a neutral Net would effectively render such innovations useless, while not addressing the underlying reality of burgeoning traffic and a finite Internet.
The Net neutrality campaign has attracted much support through the framing of the neutrality issue as a fight for freedom. “Equality for the little guy,” is the mantra - the interests of big bad cable companies/telephone companies/ISPs vs the interests of the archetypical impoverished elderly spinster on a fixed income - a real David vs. Goliath battle. Net neutrality is needed, the claims suggest, to protect both the user (our spinster or her 8-and 10-year old grand niece and nephew whose educations are ‘at risk’) and the garage or basement innovator /start-up company from corporate domination and avarice.

Through the use of emotive language and a romanticized interpretation of facts, the campaign has been very effective in garnering support. Governments listen to this emotive language -- and governments look at the numbers of people that the Internet touches. It doesn’t take much research to realize that voter interests must be heeded and that champions might be tempted to take up the cause.

Government policies too can be influenced and even shaped by emotive rhetoric. Emotive words, evocative ideals, wrapped in the illusion of “the ideals of the founders” – all have resonance in the corridors of power.

The most common example concerns the ostensible design motives behind the Internet’s end-to-end architecture in which “intelligence” or control is concentrated at the end points of the network rather than in centralized cores (the prior network control modality typified by the telephone network). Though motivated by mundane and practical considerations like speed of error detection and recovery, neutralists claim that the intent behind the decentralized design was politically motivated - a rebellious statement by socially conscious network engineers against authority and the state. Use of emotive language and phrasing such as place of freedom, heart of the Internet and defeat discrimination further enhance the myth, thereby very effectively generating mass appeal.
Proponents claim legislation is the only way to “save” or “protect” the neutrality of the Internet. However, that would imply that the Net was ever neutral ...
IV BUT THE NET WAS NEVER NEUTRAL

The push for neutrality legislation is driven by what advocates perceive as the need to preserve the neutrality of the Internet. However, the Net has never been neutral. The limitations of neutrality cannot and should not be artificially placed upon the Internet now ...

It is ironic that the Internet, born out of inequality, has become synonymous with egalitarianism. The TCP/IP protocol, which in essence is the Internet, did not win out over competing technologies because it was technologically superior. 13 Rather the U.S. government, who had been heavily subsidizing its development, actively helped it supplant competitors by paying contractors to write reference implementations of Internet protocols and then gave them away for free. 14

The protocol itself is biased. TCP/IP’s hot potato routing policies do not exhibit neutral tendencies but rather discriminate against those data packets not destined for termination on their own networks. In order to minimize network resource use, those packets are handed off at its earliest possible point.

TCP/IP is also biased against those applications and content that are latency, jitter or time-sensitive. Even the smallest delay in response time or sequential ordering of data packets can degrade the quality of the application or content like VoIP, video teleconferencing, streaming multimedia, online gaming and remote surgery. All require some form of data filtration and prioritization in order to operate reliably, particularly during high congestion periods. The FIFO and “best efforts” features of TCP/IP impede dependable and effective delivery of such services by not appropriately prioritizing between data packets.

13 Internet engineer Richard Bennett claims that the competing candidate, the ISO/OSI protocol, was far more sophisticated than TCP/IP, offering more functionality and choice but was more labour intensive with respect to programming effort.

The Internet has never been a neutral or level playing field because size has always mattered with respect to data transmission. For example, Internet backbone peering - the voluntary interconnection of networks - is tiered based on the reach of its network. The larger the network, the greater the reach thus paying less, or nothing at all, to peer with other networks. Equivalently, the smallest networks pay the most.

Performance advantages are also commensurate with size. It is well known that Google, the largest of search engines - and ironically one of the most prominent of Net neutrality advocates - employs local cacheing techniques through its massive server farms in numerous undisclosed locations around the world to ensure quick and reliable delivery of its content. Others, like Amazon and eBay pay for content-acceleration services to ensure performance advantages over their competitors.

Given that the Net has never been neutral, it does not make sense to claim that the Net can be preserved or saved by ensuring neutrality in the future. In fact, maintaining or preserving the status quo (which has not been nor is neutral), by imposing neutrality legislation would actually force dramatic changes that SeaBoard Group asserts would at worst petrify the Internet’s evolution and hinder needed investment into both core and edge facilities. We argue instead for a continuance of the current dynamic evolution model, where enlightened self-interest drives ISP and carrier decisions and a competitive market safeguards consumer interests.
NOR SHOULD IT BE...

Mandating Net neutrality is counter to the neutrality adherents’ stated aim of “saving” the Internet. Rather, a ‘neutral Net’ would be a recipe for paralysis. A neutral Net would quickly see traffic growth exceeding investment in new facilities. This excess of demand over supply would only hasten the demise of the Internet as a useful tool: it would erode the value of the Internet and discourage the investment needed to drive continued facility expansion.

One proposed neutrality strategy would be to mandate that facilities providers be separate from services vendors. We think that such an arbitrary distinction would be wrong. Restricting ISPs solely to a role of providers of a “dumb pipe” will erode the potential return to the main Internet participants and thereby diminish their investment in new facilities. That diminution of investment will have the impact of eroding the value of the Internet.

In the absence of traffic management, growing congestion can be expected to degrade user access speeds to the extent that the user experience will be impacted; loading Web pages will become more time-consuming, downloading or streaming video will be longer and subject to interruption and e-commerce transactions will be slowed (or stalled).15 With enough frequency, such degradations to the online experience of users could well deter them from returning to the Internet, or certainly decrease adoption or reliance. As users lose their enthusiasm for the utility of the Internet, we could forecast both subscriber loss, and loss to network value.16

From an economic perspective, a neutral Internet is impracticable because the economic costs of zero discrimination on the Net far outweigh the benefits that would be derived therefrom.


16 The value of a network increases as a function of the number of its members, all else constant.
Aside from the various significant time and financial costs involved in drafting, passing and enforcing new Net neutrality legislation, the additional costs of a less accessible Internet - consumer welfare loss, stifled innovation and competition, and misallocation of relatively scarce resources - grossly outweigh the benefits of a neutral (but frozen) Internet.

Since accelerated content delivery services to content providers would be a prohibited revenue stream under a Net-neutral mandate, the financial costs of infrastructure maintenance and upgrades would fall directly onto subscribers. And because these costs are spread over a smaller base of ISP customers, subscribers will have to pay higher service costs, on average. This “network access fee” tax would effectively squeeze out marginal subscribers who can no longer afford broadband services thereby exacerbating the eroding network value effect.

Without the ability to differentiate service levels to content facilitators, ISPs can only make one standardized service offering to content/application providers resulting in a loss to consumer welfare. Those subscribers who value enhanced quality of service must settle for less, and those who are satisfied with a relatively low quality of service must pay more for unwanted higher quality. Clearly, subscribers are adversely affected from both a financial and welfare perspective by a Net neutrality mandate.

Adherence to Net neutrality will also reduce investment incentives for potential investors by making it more difficult to recoup investment costs. With the surge in effective demand for bandwidth intensive content and applications, ISPs face corresponding increases in data transmission costs but would be legally barred from tapping into potential revenue streams that could help offset such costs. Consequently, this added risk must be reflected in the returns on investments (ROI) which will have the effect of decreasing the scale of projects planned or underway. Deploying and upgrading broadband networks in North America will entail investments of US $45-55B

17 Content/applications providers are ISP customers too.
over the next five years.\textsuperscript{18} Any type of regulation that impedes the recouping of such investment costs will undoubtedly slow down capital formation.

Advocates warn that should neutrality not be mandated, the added uncertainty or risk of possible discrimination by ISPs would deter innovators of content and applications from pursuing new Internet technologies. However, the reality of managed networks and the added uncertainty/risk brought on by the very debate itself, has not dampened the progression paths of content or application related innovations in the least.

The evolution of Proactive Network Provider Participation for P2P (P4P) provides a vivid example of how active traffic management has not deterred the development of consumer-driven Internet innovations. Instead, it shows how well innovators can thrive despite “discrimination” as the file transfer protocol evolved as a response to network operators slowing down, or “throttling” peer-to-peer (P2P) downloads -- end-users downloading content from random global peers. Not only does it speed up P2P downloads for end users, it decreases the backbone traffic by localizing the peering activity thereby decreasing ISP transit costs.

Conversely, Net neutrality will stifle innovation and competition by preventing ISPs from experimenting with new network management technologies and business processes that can better serve customers’ evolving demands. It is clear from the success of online priority delivery companies like Akamai, whose revenues increased 34% in 1Q 2008 from the same quarter the previous year, that the market for access tiers is growing. However, mandated neutrality would preclude ISPs from competing in such markets, thereby limiting choice for those consumers that demand more efficient data routing for their applications and content.

\textsuperscript{18} Nemertes Research (2007). The Internet Singularity, Delayed. \url{http://www.nemertes.com/internet_singularity_delayed_why_limits_internet_capacity_will_stifle_innovation_web}
Legislating a neutral Net also forces a misallocation of scarce resources because it effectively forces the price of access-tiering to be zero. Prices promote efficient rationing of scarce resources as it reflects the value an individual places on a good or service. Hence, those who are willing to pay a higher price for a good or service value it more than those who are willing to pay less. By prohibiting the owners of bandwidth from using efficient distribution mechanisms like market price, Net neutrality imposes a suboptimal distribution as bandwidth is not being allocated to its highest value use like priority delivery where demand obviously exists. A Net neutrality mandate perversely punishes efficient and responsible network and business management practices.

The Internet was never neutral, nor should it be. SeaBoard Group cautions that interference in this nascent and rapidly evolving broadband market through the imposition of neutrality regulations will have perverse and unintended consequences. Rather than “save” the Internet, a Net neutrality mandate will hasten its demise through the erosion of its network value and punish all stakeholders alike through higher Internet service prices, limited service choices, and impediments to development and growth of businesses and technology.

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19 Obvious from the success of accelerated delivery services companies like Akamai, Limelight Networks, CacheFly, Panther Express, etc.
VI BEWARE NET NEUTRALITY

The race to enact Net neutrality in Canada is fueled in part by fears that without neutrality legislation, ISPs will abuse their powers to control access and content on the Internet. SeaBoard Group believes that these fears of unregulated abuse are unwarranted. We have two fundamental reasons for our position:

• Regulatory mechanisms for controlling market dominance already exist in Canada. ISPs are subject to the Competition Act (Act) - a fundamental precept of which being that consumers have access to competitive prices and product choices. The Act also functions to ensure that small and medium-sized businesses have an equitable opportunity to participate in the Canadian economy. Supposed market dominance or other abuses by ISPs can be investigated on a case-by-case basis and the impugned company will face appropriate sanctions. The current regime protects consumers and small businesses in other areas, and the ISP marketplace is no different.

• Consumer pressure will guide the future of ISP activity. The 2006 Report of the Telecommunications Policy Review Panel expressed the belief that “market competition will, in most cases, ensure that network operators and ISPs will have little or no incentive to interfere with customer access.” Workably competitive markets respond quickly and efficiently to consumer demands, and industries shaped by market forces have been shown to be more flexible, more cost-efficient and arguably have higher standards than their government-regulated counter-parts. In an open market, ISPs will compete to be a preferred provider – consumers will take their businesses to the company providing the best service for the best price.

Canada currently takes an ex post approach to regulating ISP activity that echoes that of Europe, where a combination of anti-competition laws and the European Regulatory Framework are used to protect against
market abuses of ISPs in the absence of specific neutrality legislation.\textsuperscript{20} For example, the Framework provides remedies if an ISP with “significant market power” (SMP) were to charge for prioritization, block or degrade traffic in ways considered to be anti-competitive. Europe and Canada thus both have substantial protection against market abuses without specific neutrality legislation.

Not only are Net neutrality regulations unnecessary, the creation of new, ex ante regulations would likely produce unwanted consequences that could stifle the growth of the Internet as a whole. Even with a significant amount of resources and effort, a regulatory scheme which specifically prohibits certain ISP behaviours will have difficulty keeping up with the incredibly fast pace of technological innovation. It is likely that neutrality laws would have to be continually updated and altered to sufficiently correspond to the realities of the market.

Allowing the market to flexibly respond over time to improvements in technology and consumer demands is favourable to creating a series of premature, ex ante regulations that will likely be a bad fit for the Internet. Like any preemptive strike, unforeseen casualties are sure to occur if neutrality legislation is allowed to go through. The CRTC, in its review of its approach to new media services on the Internet, decided in 1999 not to regulate. The Commission’s logic suggested that to regulate new media (and Internet) services would be to put Canada’s industry at a competitive disadvantage in the global marketplace. SeaBoard Group thinks the CRTC “got it right” in 1999. We recommend that Canada continues to be prudent in its approach to the burgeoning ISP and broadband market and resist the calls to rush to regulate the provision of Internet service.

\textsuperscript{20} http://ofcom.org.uk/media/speeches/2007/03/regulate
CONCLUSION

The campaign for Net neutrality has been presented as a necessary measure to “save” or “preserve” the Internet. SeaBoard Group cautions that such a mandate would not achieve the stated objective, and indeed, actions to preserve the Net by limiting the interests and flexibility of the service providers would have the opposite effect. Rather than preserving the Internet as a useful tool, mandated neutrality would only hasten its demise.

Mandated Net neutrality is detrimental to the growth and development of the Internet because it erodes the value of the network through performance degradation. Traffic management techniques needed to keep data flowing would be restricted – engineering needs would give way to legal precepts. Mandated Net neutrality is also economically impracticable. It will result in increased costs to consumers for a standardized level of service and consequently, will lead to a loss in consumer welfare.

Application and content providers would also experience a welfare loss from the imposition of Net neutral governance. Content providers would be precluded from taking up an an option to subscribe to accelerated delivery services (such as those provided by net services companies like Akamai, Limelight and CDNetworks.)

SeaBoard Group believes that instituting a Net neutral regime will also have a negative impact on innovation. It is clear that much of the innovations enabled by the Internet occur at the edge of the network - users are innovators more so than institutions. Curiously the very innovations that the Net neutralists claim to want to protect are the very innovations that can benefit most from traffic management and prioritization.

We note too that legislated neutrality will dampen much-needed capital investment for infrastructure maintenance and upgrades. Prohibiting service providers from themselves being able to offer applications or content reduces their opportunity to realize revenues and thereby impairs their ability to recoup costs. Furthermore, Net neutrality
prohibits ISPs from experimenting with innovations in network and business management. It clearly forces a misallocation of scarce resources and effectively punishes efficient and responsible network and business practices.

Net neutrality regulations are unnecessary because regulatory mechanisms already exist in Canada - the Competition Act being notable - to ensure consumers have access to competitive prices and product choice, and small to medium businesses have equitable access to participate in the economy. Furthermore, we note that competitive market forces will be a more flexible, more responsive and more certain guide to ISPs behaviour than codified regulation.

Unintended and unwanted consequences are likely with the creation of new, and unnecessary regulations. SeaBoard Group recommends that Canada be prudent in its approach to the burgeoning ISP and broadband market and not rush to regulate the provision of Internet service.

Our conclusion is that the government should forbear from overt regulation of the Internet. Let market forces, coupled with existing legislation and regulation that safeguards consumer and corporate interests, continue to shape the direction of the Internet. Private capital which invests in network provision and expansion will be rewarded, operators who invest too little and ‘shape’ traffic too much will be rewarded with a shrinking customer base. Conversely, operators that make the needed investments to continue to increase the quality of the product and enhance the user experience will be rewarded.

The ideal role for government is to speak softly, and if it must carry a stick, make it a small one. We might also suggest that it also carry some carrots – should the urge strike them to encourage specific innovation (like remote area access) a modicum of encouragement might well work more miracles than the threat of sanction.
APPENDICES

Overview of the Net neutrality debate in selected countries:

A. United States
B. Canada
C. United Kingdom
D. Australia
E. Germany
F. France
G. Japan
H. South Korea
A UNITED STATES OF AMERICA

Overview:

The Internet remains largely unregulated in the USA, although the Federal Communications Commission (FCC), an independent federal government agency established by the Communications Act of 1934, has some jurisdiction. The FCC regulates interstate and international communications via radio, television, wire, satellite and cable. Section 706 of the Telecommunications Act directs the FCC to “encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans.” The FCC has as one of its goals “to broaden the deployment of broadband technologies, define broadband to include any platform capable of transmitting high-bandwidth intensive services, ensure harmonized regulatory treatment of competing broadband services, and to encourage and facilitate an environment that stimulates investment and innovation in broadband technologies and services.”

Broadband services were initially regulated according to the technology through which they were delivered, cable Internet being largely unregulated due to its classification as an information service and DSL being subject to unbundling requirements. Advocates of network neutrality wish to re-classify both under the old rules for DSL, which require unbundling and several other restrictions. In 2005 the Supreme Court upheld the classification of cable Internet as an information service in the case Brand X and the FCC removed the unbundling requirements of DSL.

On August 1, 2008 the FCC officially called for Comcast to halt its interference with applications, and its blocking and slowing of traffic through its cable modems. In the decision, the FCC declared its power and willingness to enforce its Internet principles. In his press statement, Chairman Kevin J Martin remarked, “if legal content is arbitrarily degraded or blocked, and the defense is “network management,” the broadband operator must show that its network management practice is

21 Telecommunications Act of 1996, s. 652


23 National Cable & Telecommunications Association et al. v. Brand X Internet Services et al., 545 U.S. 967 (2005)
reasonable. We will look at whether it furthers an important interest and is carefully tailored to serve that interest. Also, the practice should be disclosed to consumers so that they can make informed decisions when purchasing broadband service.”

The Internet principles mentioned in the recent Comcast decision refer to the Policy Statement laid out by the FCC in 2005 which includes four guiding principles:

1) consumers are entitled to access the lawful Internet content of their choice
2) consumers are entitled to run applications and services of their choice, subject to the needs of law enforcement
3) consumers are entitled to connect to their choice of legal devices that do not harm the network
4) consumers are entitled to competition among network providers, application and service providers, and content providers.

These principles are not strictly enforceable, however, and merely serve as guidelines to shape Internet activity. These principles, along with a fifth principle of nondiscrimination, have been associated with Network neutrality. Advocates of neutrality would like to see these principles fully enforceable by the FCC.

Many attempts at legislating Net neutrality have been made in recent years, however none of these have made it into law.


25 FCC 05-151, FCC Policy Statement of 8/5/2005


and consumer choice issues relating to broadband Internet access services, and for other purposes." Lawmakers of the Subcommittee on Telecommunications and the Internet entertained arguments regarding the bill in June of 2008. The House vote is pending. The Bill has been through Committee.

Given the challenges that proponents of net neutrality face at the federal level, many have turned to a state level campaign as well. Although net neutrality backers were unsuccessful at passing legislation in both California (by Senator Kevin Murray, CA SJR 24) and New York (by Assemblyman Richard Brodsky, NY Bill A11549) earlier that year, there has been a continued push to pass such mandates on a state-by-state basis.  

In 2007, a small regional ISP, Cowpowi, began offering Internet service that guaranteed neutrality of its service. Cowpowi doesn’t own any "last-mile" lines to people's homes, which means that it needs to lease DSL lines from local telcos, and is therefore at the mercy of these companies to ensure there will be no throttling of access. The telecom companies seem to be willing to guarantee no throttling as long as Cowpowi is willing to pay. The cost of ensuring a neutral net is passed over to Cowpowi’s customers who pay at the high end of the spectrum for their unimpeded Internet service. If access to uninterrupted Internet becomes an issue, the US could begin to see more ISPs like Cowpowi in the near future.

**Regulating Bodies:**

Federal Communications Commission (FCC)

**Regulations:**

*Telecommunications Act*  

**Major ISPs:**

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29 “Meet Copowi, the world’s first ISP to guarantee network neutrality,” Nate Anderson, online: http://arstechnica.com/articles/culture/Meet-Copowi-the-worlds-first-ISP-to-guarantee-network-neutrality.ars

America Online, EarthLink, Yahoo, AT&T Corp., Sprint, Verizon
B  CANADA

Overview:

Canada has a high level of broadband coverage, including virtually all of its urban centers and 78% of rural areas. Increases in Internet activity have created tension between ISPs and consumers over how to manage the Internet to avoid a broadband crunch. While there is general consensus that the Canadian Radio-television and Telecommunications Commission (CRTC) has the necessary legislative powers under section 27 and 36 of the Telecommunications Act\(^\text{31}\) to deal with the Net neutrality debate, in practice the problems are very fact-specific and are proving extremely difficult to understand and resolve.\(^\text{32}\)

The debate on Net neutrality officially arrived in Canada in 2005 when, during an employee strike, Telus blocked access to Voices-for-Change.com, a website run by and for Telecommunications Workers Union members.

The most recent development relating to the debate over Net neutrality occurred in early 2008, when the Association of Internet Providers (CAIP) called for a cease and desist order against Bell Canada that would force them to discontinue running traffic-shaping hardware on the lines it resells. Bell is not the first or only ISP to traffic-shape - Rogers has been shaping P2P traffic for years as well as throttling all encrypted network traffic since 2007, as has Shaw. Bell is, however, the first to affect wholesalers and retailers of its services. The CRTC decided against the interim measure, finding that the ISPs in the Alliance were not suffering the irreparable harm that would necessitate an injunction.

There is currently no definitive statement or ruling to prevent ISPs from managing their networks and shaping the traffic on their lines. The CRTC should rule by September 2008 on whether Bell Canada’s practice of

\(^{31}\) Telecommunications Act (1993, c. 38)

\(^{32}\) David Kidd, Blake, Cassels & Graydon LLP, conversation
throttling traffic for its own subscribers and for ISPs that lease its infrastructure is a violation of the Telecommunications Act.

On May 28, 2008, the federal New Democratic Party (NDP) introduced Private Member’s Bill C-552\(^{33}\) to the House of Commons. This bill intends to entrench the principles of Net neutrality and regulate against interference by service providers by prohibiting “network operators from engaging in network management practices that favour, degrade or prioritize any content, application or service transmitted over a broadband network based on its source, ownership or destination, subject to certain exceptions.” The bill has been introduced to the House of Commons and is pending.

**Regulating Bodies:**

Canadian Radio-television and Telecommunications Commission (CRTC)

**Regulations:**

*Competition Act*\(^{34}\), *Telecommunications Act*\(^{35}\), *Bell Canada Act*\(^{36}\)

**Major ISPs:**

Quebecor, Rogers, Cogeco, Telus, MTS Allstream, Shaw, Sasktel, Eastlink, Bell, Bell Aliant

Canada’s leading telecommunications and cable companies have formed the Canadian ISA Alliance.

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\(^{35}\) *Supra* note 37.

\(^{36}\) *Bell Canada Act* (1987, c. 19)
C UNITED KINGDOM

Overview:

According to the Director of Policy Development at Ofcom, the UK communications sector regulator, although a debate on network neutrality is taking place in the UK, a combination of anti-competition laws and the European Regulatory Framework are substantial enough to protect against market abuses of ISP, making Net neutrality legislation unnecessary at this point. Two emerging points of concern in the UK are transparency of consumer information and service migrations. For consumers to be in a position to shop for the best ISPs, they must have access to reliable information about what service they are getting. Similar findings were produced at the first major debate on Net neutrality in the UK held at Westminster on the 20 March 2006, attended by trade secretaries, telecommunications regulators and industry experts.

The European Commission, during proposals to amend the Regulatory Framework in November of 2007, indicated that prioritization should be considered generally beneficial to the market as long as consumers have access to services they want and information about the services they are getting. The Commission also proposed the imposition of minimum quality of service requirements, recognizing that they will be unable to effectively prevent network providers from degrading the service of their customers. The European Parliament will hold a plenary vote on the draft reports from the committees in charge of reviewing the proposals in September 2008 and the adoption of those proposal should take place in 2009.

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**Regulating Bodies:**

*Communications Act*[^38], *European Regulatory Framework*[^39], *Access and Interconnection Directive*[^40]

**Regulations:**

The UK is regulated in part by the *European Regulatory Framework* which is transposed onto the *Communications Act*. The Framework provides remedies if an ISP with “significant market power” (SMP) were to charge for prioritization, block or degrade traffic in ways considered to be anti-competitive. If the ISP is not considered to have significant market power, then the same activity would be unlikely to be considered anti-competitive and would not be regulated. However, Article 5.1 of the *Access and Interconnection Directive* allows the UK to impose remedies to ensure end-to-end connectivity. The *European Regulatory Framework* also enables all suppliers to comply with general conditions, for example, information transparency.

**Major ISPs:**

BSkyB, BT Retail, Carphone Warehouse, Orange, Tiscali, Virgin Media, ntl

[^38]: *Communications Act* 2003 (c. 21)
D  AUSTRALIA

Overview:

As of July 2008, 60% of Australian homes have Internet access. Broadband connections outnumber dial-up two to one and are on the rise. In 2007 the Australian government signaled its desire to support the spread of Broadband Internet access across the country by creating the Australian Broadband Guarantee, offering subsidies to residents who are unable to access broadband at their principal residence. The Guarantee replaces the Broadband Connect Incentive Programme, which also intended to spread broadband coverage throughout Australia.

Net neutrality is being debated in Australia, although perhaps not as hotly as in North America. The debate has thus far centered around the activities of Australia’s most powerful telecom, Telstra. In recent years, customers of Telstra’s competitors lodged many service complaints causing Telstra to eventually admit that it had been actively deprioritising other VoIP providers’ data through its lines. An ACCC investigation found that while current legislation did not prohibit prioritization per se, Telstra had used its monopoly position to disadvantage other players.

On 14 July 2008, the Australian Competition and Consumer Commission (ACCC) ruled that Telstra must keep records on its exchange facilities and give this information over to the ACCC in monthly reports. ACCC Chairman, Mr Graeme Samuel said, "The ACCC believes that there is a strong need for independent oversight of Telstra’s processes to cap exchanges to ensure that Telstra is held accountable and access seekers are not unreasonably denied access to Telstra exchanges. There is also a clear need to identify the exact cause of delays"


with Telstra’s queuing system.” A copy of the record keeping rule will be available on the ACCC website.43

Until recently, Telstra only sold its slower ADSL broadband services under wholesale arrangements.44 In 2008, however, the telecom giant fully opened access to its ADSL2+ broadband service. The company declared that capacity restrictions that had forced them to deprioritise other service providers data would be remedied with this opening. In August 2008, Telstra announced that it will connect wholesale customer People Telecom to its ADSL2+ broadband service. People Telecom chief executive John Stanton said it expected to make the services available to customers from September.

**Regulating Bodies:**

The Australian Communications and Media Authority (ACMA) is the main regulator of the Internet and telecommunications, administering the *Telecommunications Act*. ACMA has a range of roles and responsibilities relating to the Internet. It administers a scheme for dealing with content on the Internet, enforces Australia’s anti-spam law and can make rules about accessing the Internet via premium mobile phone services.

The Australian Competition and Consumer Commission (ACCC) is responsible for administering the telecommunications industry access regime and the telecoms-specific anti-competitive conduct and consumer protection provisions in the *Trade Practices Act*.

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Regulations:

Telecommunications Act\textsuperscript{45}, Trade Practices Act\textsuperscript{46}

Major ISPs:

Internode, iiNet, TPG Internet, OptusNet, Telstra BigPond, Exetel, Westnet, Netspace, aaNet, Adam Internet, AAPT


Germany

Overview:

Internet transmission services are regulated by the Telecoms Act, as they are regarded as part of telecommunications in Germany. All content-related Internet services are regulated by the Telemedia Act and the State Treaty on Broadcasting and Telemedia.

Germany is one of the top DSL countries in the European Union, although DSL coverage is still lacking in some rural areas. Deutsche Telekom has a number of resellers, and many ISPs providing service for it. Alternatively, there are DSL providers in Germany which have their own DSL network who rent the copper lines from the incumbent in a LLU arrangement. The Internet service market has seen dropping prices and the rapid emergence of new technologies, but most providers only offer very long contract terms of 1 or 2 years.

The Internet regulator, BNetzA, plans to allow Deutsche Telekom to run a new high-speed network with little regulation, angering the EU’s competition authorities.

Regulating Bodies:

BNetzA is the independent regulating body for the telecom market in Germany. Among other things, BNetzA is responsible for the supervision and imposition of universal service obligations, market definition and analysis, the imposition of access obligations on telecoms network operators, the regulations of fees for telecom services, and the control of abusive practices of telecom companies with SMP. BNetzA has also been given the power to issue ordinances according to the Telecoms Act by the Federal Ministry of Economics and Technology.
Regulations:

Telecoms Act, 2004 (revised 2007)

Major ISPs:

T-Online, Freenet AG, QSC AG, Claranet, Alice, Arcor, 1&1
FRANCE

Overview:

In metropolitan France, intense competition between Internet service providers has led to the introduction of moderately-priced high speed ADSL with packages often offering services such as unlimited free VoIP telephone communications to land lines, and digital television. There are no caps on broadband in France, and the Internet market is beginning to see the opening of smaller "boutique" broadband suppliers that specialize in meeting the needs of specific market segments.

Orange SA, once Wanadoo and a subsidiary of France Telecom, is the leader in the ISP market controlling half of the market and is helped by the reputation and availability of physical shops of the incumbent operator in overcoming slightly higher prices because of its obligation of using fixed prices. Other operators shares the rest.

In 2006 the deployment of optical fiber offers was announced.

The first public case relating to the Net neutrality debate in France came in 2007 when the French ISP Neuf Cegetel was accused by the video-sharing site Dailymotion of throttling access. Neuf Cegetel refuted the claims citing technical difficulties and the subject was eventually dropped. Whether the disagreement stemmed from throttling of access or from sly negotiating tactics on the part of Dailymotion for more beneficial peering agreements, the controversy signaled the coming of the Net neutrality debate to France.47

Regulating Bodies:

Autorité de Régulation des Communications Électroniques et des Postes (ARCEP), governed by L36-5 and L36-13 of the CPCE. The ARCEP must be consulted on legislation and regulation over the electronic

communications. The ARCEP also reviews licenses and settles disputes between operators.

**Regulations:**


**Major ISPs:**

Teleconnect, Alice, Neuf Télécom, Bouygues Telecom, Orange
G  JAPAN

Overview:

Broadband service in Japan is 8 to 30 times faster than in the United States and Canada and is considerably cheaper. In fact, Japan has the world’s fastest Internet connections at some of the world’s lowest prices.

The Japanese government began a partial privatization of its largest telecommunications company, Nippon Telegraph & Telephone Corp. (NTT) in the mid-1980s, shifting the communications sector towards a more market oriented system. However, government subsidies for fiber-optic infrastructure have continued since the early 1990’s. Since 2001, the government has been subsidizing the development of Internet infrastructure under a policy called “E-Japan Strategies”. This program, run by the Headquarters for the Promotion of Advanced Information and Telecommunications Network Society, has contributed to the surge in speed and vast coverage of the Japanese Internet. Subsidies will likely continue into 2011 as part of a plan to further improve broadband infrastructure to reach 90% coverage by 2010.

Relying on NTT’s existing infrastructure, other start-up ISPs began to offer DSL service in the late 1990s. These ISPs operated largely at the discretion of NTT until 2000 when the Japanese Fair Trading Commission warned NTT over its treatment of new DSL providers. At the same time, The Ministry of Internal Affairs and Communications (MIC) have since put in place requirements that call for NTT to clarify the terms and fees it offered competitors for access to its network, lease out its unused fiber-optic infrastructure at low prices, and unbundle its metallic and fiber-optic local loops. Since these changes, the smaller Japanese ISPs have become more successful.

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48 Broadband Connectivity Competition Policy: FTC Staff Report June 2007

49 Ibid.
Similarly to South Korea, Japan’s high levels of population density have been credited for its relatively high Internet infrastructure penetration. The high speeds in Japan allow for full-screen, broadcast quality television to be watched over the Internet. Extremely fast applications are being created for teleconferencing and telemedicine. Experts predict that the high speeds found in Japan will entice Internet innovators away from North America to Japan.

**Regulating Bodies:**

Ministry of Internal Affairs and Communications (MIC) is the authority on policy making and development for the telecoms and information sectors.

**Regulations:**

*Telecoms Law*

**Major ISPs:**

Yahoo!BB, Biglobe, OCN, @Nifty
SOUTH KOREA

Overview:

South Korea has the world’s highest number of broadband services per capita. In 1995 Internet use was relatively low in Korea with only approximately 10% access. By 2003, however, 78% of South Korean Internet users logged on via a broadband connection. The explosive growth in broadband penetration has been attributed to the privatizing of Korea Telecom (KT) in the early 1990's and the continued investment and subsidization of infrastructure by the Korean government. Korea initiated the Korea Information Infrastructure project in 1995 to fund a national, high-speed public backbone, information technology pilot projects, and technology investment funds.

The subsidization projects and the growth of Internet popularity in Korea has created incentives for the emergence of many ISPs. These ISPs, however, have faced a degree of unprofitability and may be moving towards consolidation. Also, in 2004, the South Korean government subjected KT to stricter service and pricing regulations on the grounds that KT’s dominance was a barrier to competition in the broadband market. The South Korean government also implemented local loop unbundling requirements in 2002.

In South Korea, Internet phone service is a nationwide calling service without coverage limitation. VoIP has its own common service identification code, 070. Internet phone services have minimum standard requirements which ensure an overall call success rate of over 95%. End-to-end delay must be 150ms or fewer and Internet phone services must have an R-value of over 70.

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50 Int’l Telecoms. Union, Broadband Korea: Internet Case Study 1, 10 (2003), online: http://www.itu.int/ITU-D/ict/cs/korea/material/CS_KOR.pdf.


In 2005 the South Korean government classified VoIP as a “basic telecommunications service,” such that phone service regulations apply to VoIP as well. This means that, in contrast to the US where VoIP is considered an unregulated information service, VoIP service providers are required to hold a license from the Korean government to sell their service and are subject to telecom regulations. Thus, all VoIP services must be offered through licensed telecoms. Operators like Skype who use unspecified broadband networks, must be recognized as an official reseller and provide a 070 number. In order to provide service within Korea, foreign businesses must contract with local service providers.

Like Japan, South Korea’s broadband penetration has been partially attributed to the relatively high population density of the country. This means most individual housing units are relatively close to telephone exchanges, which facilitates and simplifies last-mile connectivity.

**Regulating Bodies:**

Ministry of Information and Communication (MIC) is responsible for the telecommunications sector.

**Regulations:**

*Telecommunications Business Act, 2002*

**Major ISPs:**

Hanarao, Thrunet, Dacom, Korea Telecom (KT)

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53 Although computer-to-computer VoIP calls are also still being allowed

FOR FURTHER READING

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SEABOARD GROUP

SeaBoard Group is an independent marketing and technology research company with offices in Toronto and Montreal.

This White Paper was prepared for SeaBoard Group clients and other interested parties as part of SeaBoard Group’s continued research on market trends and technologies. SeaBoard Group would be pleased to arrange for briefings on any of the subjects covered in this white paper.

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