

Net Neutrality 101

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NETWORK NEUTRALITY IS A CONTROVERSY OF AMERICAN ORIGIN, which, given the American foundations of the internet, has spread to a number of other jurisdictions, including Canada. In this article, I attempt to provide an introduction to the issues in a Canadian context for the non-specialist. Network neutrality is a debate about the public interests in freedom of expression, consumer protection, and economic growth and innovation, as they are mediated by the expansion of broadband internet access. I attempt to make the technical underpinnings comprehensible and to introduce many of the terms of art employed in the discussion. Comparisons of the Canadian and American legal contexts and of the issues in question clarify the potential requirement for regulatory intervention in Canada. I examine the issue as it presents itself in practice, that is, in the light of the actual functioning of the internet today. I summarize the principal arguments of the advocates and opponents of network neutrality regulation and weigh them against the public interests at stake. The intersection of the internet and broadcasting worlds enabled by broadband leads to the perennial issue of Canadian content. Does the internet represent a threat to the ability of Canadian broadcasting licensees to meet their Canadian content obligations and if so, should the technologies which underlie the network neutrality issue be employed in the interests of preserving the current Canadian model? I conclude, in accord with recent OECD and Federal Trade Commission study groups, that the case for regulatory action to control network operators' prerogatives to manage access and traffic on the internet remains to be made.

LA NEUTRALITÉ DU RÉSEAU EST UNE CONTROVERSE D'ORIGINE AMÉRICAINE qui, étant donné les fondements américains de l'Internet, s'est propagée dans un certain nombre de ressorts, le Canada y compris. Dans cet article, je m'efforce d'analyser ces questions dans un contexte canadien à l'intention du profane. La neutralité du réseau est en fait un débat qui porte sur les intérêts publics de la liberté d'expression, la protection des consommateurs et la croissance et l'innovation économiques, dans la mesure où ils ont été médiatisés par l'expansion de l'accès aux services Internet à large bande. Dans cette optique, je tente d'en rendre compréhensibles les fondements techniques et d'expliquer bon nombre des termes techniques employés dans le cadre de cette discussion. Le fait d'établir des comparaisons entre les contextes juridiques respectifs du Canada et des États-Unis et entre les questions en jeu permet d'éclairer l'éventuelle nécessité d'adopter une réglementation au Canada. J'examine en outre la question sous l'angle de la pratique, soit à la lumière du fonctionnement de l'Internet de nos jours. Je résume les principaux arguments des défenseurs et des adversaires de la réglementation de la neutralité du réseau et les évalue par rapport aux intérêts publics en jeu. L'entrecroisement entre les deux mondes que sont l'Internet et la radiodiffusion, né de l'accès à Internet à large bande, mène à la question récurrente du contenu canadien. L'Internet représente-t-il une menace à la capacité des titulaires de licence de radiodiffusion canadiens de remplir leurs obligations canadiennes et, le cas échéant, devrait-on employer les technologies qui sous-tendent la question de la neutralité du réseau dans le but de conserver le modèle canadien actuel? Je conclus, à l'instar des récents groupes d'études de l'OCDE et de la *Federal Trade Commission*, que la nécessité d'adopter une réglementation en vue de contrôler les prérogatives des opérateurs de réseaux en matière de gestion de l'accès et du trafic sur Internet reste encore à démontrer.

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1. INTRODUCTION

THE PURPOSE OF THIS PAPER IS TO OUTLINE SOME OF THE BACKGROUND and issues associated with the debate which has become known as “network neutrality.” This debate originated in the United States and has spread to other English-speaking countries and to the OECD. The internet has assumed a role in our society, to which any perceived threat ignites an emotional response. It has also assumed a role in markets which means that large financial interests ride on its structure and evolution. In this article, I attempt to reduce the advocacy quotient in the discussion and to select from the international debate, largely American, the analysis of which is pertinent to the Canadian situation.

In Part 2 of the paper, I describe a simplified technical underpinning for network neutrality and begin to provide a guide to the terms of art employed. While the technical issues can be made relatively accessible, much of the literature assumes more or less familiarity with the functioning of the internet. This may be unnecessarily inhibiting for the uninitiated. The net neutrality debate is not about technology; it is about how technology should be used in the public interest.

In Part 3 of the paper, I draw out various strands of the network neutrality issue and try to identify the public interests at stake in it. I describe the different legal contexts of internet services in the United States and Canada and the recommendations which have been made by the Telecommunications Policy Review Panel.

In Part 4 of the paper, I attempt to identify network neutrality issues in practice; that is, as they present themselves in light of the actual functioning of the internet today. I outline the main arguments of the two sides of the debate and weigh them in relation to the public interest objectives at stake. To what extent does the internet currently display the features of neutrality as postulated by its advocates? Is there reason to fear changes in the ability of consumers, non-commercial entities, or start-ups to access the internet effectively? How should

network operators recover capital investment to meet burgeoning internet demand?

In Part 5 of the paper, I examine the issue from the unique perspective of the Canadian *Broadcasting Act*.¹ Canada is hearing demands for “network neutrality” from broadcasting stakeholders, which are better described as demands to apply the principles of regulation of broadcast distribution to the internet.

In Part 6 of this paper, I draw some brief conclusions about regulatory oversight of the issues raised by network neutrality and compare them with international discussions of the subject.

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2. THE TECHNICAL UNDERPINNINGS²

TO VASTLY OVERSIMPLIFY, THE PARADIGMATIC NETWORKS of the twentieth century were the service-specific, circuit-switched, copper-based telecommunications system and the equally service-specific over-the-air, one-way, television broadcast system. The paradigmatic network of the twenty-first century is a multi-service, packet-switched, fibre-based communications system. The evolution from the first two to the third is at the root of the network neutrality issue (and a great deal more). Let us take each dimension in turn.

Service-specific networks were highly adapted to one particular type of information flow and its traffic characteristics. Telephony systems involve two-way 64 kilobits per second (kb/s) traffic, for example, while broadcast systems involve 3 megabits per second (Mb/s) one-way traffic. Today’s packet networks—the internet, as the case in point—can carry a multitude of different flows of information, which may be of widely different throughputs, since all flows are first converted into a common base unit of a digital data packet before entering the network. Each of these flows may vary greatly in average data rate (usually expressed in kb/s or Mb/s), but today’s networks can instantaneously accommodate drastically varying data rates.

Since the twenty-first century packet network can handle a vastly expanded set of services, with each service consisting of a flow of packets, it has proven to be the platform which enables a rapid migration by service providers from the legacy networks to a single, multi-purpose network. (Note, however, that such networks can be partitioned into public and private applications.)

A circuit-switched telecommunications system establishes, by switching, a specific pathway or circuit from any calling location to any called location. As

1. *Broadcasting Act*, (1991) *Statutes of Canada*, ch. 11, <<http://laws.justice.gc.ca/en/ShowFullDoc/cs/B-9.01///en>> [*Broadcasting Act*].
2. I am indebted in this and the following section to Zlatko Krstulich, to the OECD Working Party on Telecommunication and Information Services Policies, “Network Neutrality: A Policy Overview,” (27 April 2006) at paras. 21–67 [OECD1]; to the same OECD Working Party on Telecommunication and Information Services Policies, “Internet Traffic Prioritisation: An Overview,” (6 April 2007) DSTI/ICCP/TISP(2006)4/FINAL, <<http://www.oecd.org/dataoecd/43/63/38405781.pdf>> at pp. 7–15 [OECD2]; to Edward W. Felten, “Nuts and Bolts of Network Neutrality,” (6 July 2006) *Center for Information Technology Policy, Princeton University*, <<http://itpolicy.princeton.edu/pub/neutrality.pdf>>; and to Dale N. Hatfield, Bridger M. Mitchell and Padmanabhan Srinagesh, “Emerging Network Technologies,” in Sumit K. Majumdar, Ingo Vogelsang, and Martin E. Cave eds., *Handbook of Telecommunications Economics, Volume 2: Technology Evolution and the Internet* (Elsevier, 2005) 29–77.

long as the circuit is open, any break in the exchange of information from one party to the other results in a corresponding loss of efficiency occasioned by an open circuit which carries no information. These inefficiencies may be very large indeed, especially if the circuit capacity is engineered to handle peak traffic flow. A packet-switched communications system carries a very large number of packets of similar structure (though widely diverse in terms of content), each individually addressed, across a network of routers, whose function is to forward the packets to the next available router which is on the destination path of the packet.

Unlike a circuit-switched system, packet switching by routers does not establish a single communications pathway from the calling to the called location. Rather, packets will transit a network of routers, to be reaggregated at the called location into a coherent message. In principle, any given packet will transit through the network as a function of the availability of a router and on the destination path. This kind of network enables major productivity gains. First, its multifunctionality itself creates economies of scale. One network does what a number of different networks used to do. Second, the network can interpolate individual packet flows of varying types and sources, regardless of size, which are transiting the network infrastructure at any given time. The packet-switched network is designed to operate at a higher level of capacity utilization than the legacy network could.

It was the introduction of optical fibre which enabled an exponential increase in the transport capacity and speed of a wireline communications system, while simultaneously reducing operational expense. It is this complex of features—flexibility and multifunctionality, efficiency, capacity, and speed—which, in combination with even more dramatic improvements in computing and information storage technology, permits the internet of today to meet so many different communications needs, including the transmission of audiovisual programming, and to play such a central role in culture, economy, and society.

A certain (oversimplified) image of the packet-switched network has been rhetorically important to the debate over network neutrality. A circuit-switched network is crucially dependent upon the intelligence of its switches, which establish and close the communications pathways from calling to called parties. This kind of network is said “to have its intelligence at the core of the network.” A packet-switched network is crucially dependent upon the computing power at the calling and called location. This kind of network is said “to have its intelligence at the edges of the network.”

Such an image of the packet-switched network is thus one in which the essential functions are carried out by computers at either end of a communication, with the intervening routers fulfilling the comparatively uncomplicated task of forwarding packets to the nearest available router on the way to any given packet’s destination. This image of the network embodies something which has come to be called “the end-to-end argument,” emphasizing that the crucial functionality lies at either end of an internet communication.³

3. See Marjory S. Blumenthal and David D. Clark, “Rethinking the Design of the Internet: The End-to-End Argument vs. the Brave New World,” in Benjamin M. Compaine and Shane Greenstein, eds., *Communications Policy in Transition: The Internet and Beyond* (MIT Press, 2001) 91–139, <<http://www.caip.rutgers.edu/~virajb/readinglist/rethinking.pdf>>.

Such a network facilitates the creation of services by a multitude of dispersed actors independent of the network operator's control or even knowledge. Relative to the closed and operator-controlled networks of the twentieth century, this is revolutionary. Traditional telephony cost recovery with metered consumption by identifiable calling parties is replaced by "bursty," asymmetric data flows in which cost causality becomes extremely difficult to establish, measure, and bill.⁴

Packets are, as we have said, similar in structure, in order to be in compliance with internationally defined standards such as TCP/IP, the Transmission Control Protocol/Internet Protocol. Each packet has what is known as a "header" which has information regarding the destination, the source, and the nature of the information in the packet. Recall that routers are, under the end-to-end principle, supposed to forward any and all packets indifferently on a first-come, first-served basis, as long as there is an available router on a route to the destination of the packet. This is sometimes known as "bit parity." Routers are, in principle, available as long as their buffer—their capacity to store packets awaiting transmission to the next router—indicates that it is not in a congested state. When the router's buffer is congested, it signals to adjacent routers its non-availability. Since internet traffic is cyclical (by time of day and application) and bursty (subject to dramatic volatility over milliseconds), the requirement to manage congestion was an integral part of the design of packet networks, and thus, of the internet.⁵

The way a network responds to the overcrowding or congestion of one of its elements is embodied in "routing algorithms" stored in network traffic management technology. It turns out that one important element of traffic management technology is the ability of a router to distinguish the kinds of packets it is transiting—their destination, their source, and their type—and to treat different packets differently. Some routers can go beyond reading the envelope (the header) of a packet. Such routers use what is called "packet inspection" technology to examine the contents of a given packet or sequences of packets in a flow and then to deal with a given packet as they have been programmed to do.⁶ This could mean giving it higher or lower transit priority, blocking it, or simply collecting statistics on the types of applications a customer has been using over the internet. The core of the packet-switched network is not

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4. See Rob Frieden, "Network neutrality or bias? Handicapping the Odds for a Tiered or Branded Internet," (2007) 29:1 *Hastings Communications & Entertainment Law Journal* 171–216, <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=893649#PaperDownload>. By *asymmetrical*, I refer to the balance of traffic in each direction of the transmission pathway(s); in the case of the internet, this is likely to involve small amounts of data upstream from users and larger amounts of data downstream from websites toward users. This traffic is, in addition, *bursty*, that is, subject to short, sharp increases in volume followed by periods of low traffic volume.
 5. For an accessible alternative account of the congestion challenge, see Kai Zhu, "Bringing Neutrality to Network Neutrality," (2007) 22:1 *Berkeley Technology Law Journal* 615–645 at pp. 616–624.
 6. This is also one type of technology used by authoritarian countries to try to control their citizens' access to internet content to which they object. Of course, there is a technological cat-and-mouse game at work here. For example, the geo-gating technology currently used for digital rights management on the basis of national boundaries can be overcome by a sophisticated user. Authoritarian countries grappling with the censorship of the internet must continuously struggle to raise the cost to their citizens of access to forbidden content. They cannot for a moment presume to have achieved the control they seek. However, for our purposes here, we assume that the technical means available to the majority of consumers of internet services will not definitively pre-empt the questions of principle raised by the network neutrality issue. For the technological countermeasure dynamic, see Felten, *supra* note 2 at pp. 7–9.

as dumb as advertised in the image of the end-to-end network to which we alluded above.⁷

Now an important part of the network neutrality debate turns on what should be permissible in the way of traffic management by network owners. The enormous increase in communications capacity created by the twenty-first century network has induced equally demanding applications and there is as yet no end to demand on the internet. The original internet was not conceived for on-line gaming, downloading of video files, or videoconferencing; however, the huge and rapid increase in capacity of switching, access, and transmission systems has enabled these new applications to be reasonably well-supported, as long as individual flows of packets are distributed in time over a large pool of users. Such applications, if sustained over long periods or invoked by a large number of users simultaneously, place heavy demands on the network and naturally attract the interest of network managers.

If traffic management technologies enable network owners to treat different packet flows differently, then the end-to-end principle no longer applies. What legal framework should govern the use by network managers of the ability to distinguish among packets according to their source, their destination, the application they support, or the relative load they place on the shared resources of the internet?

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3. THE ISSUE IN PRINCIPLE

3.1. "Technical Background"

IN THE CIRCUIT-SWITCHED WORLD, THE NETWORK OWNER was a "telecommunications common carrier": the operator of transmission facilities that are offered to the public for purposes of communications against compensation. Part and parcel of the obligations of the common carrier was that the operator had no right to interfere with the content of communicated messages or to discriminate among his customers in pricing or providing access to the transmission facilities, except as specifically provided by law or regulation.

The operator of a circuit-switched network had, barring legal obligations for access in the name of crime prevention or national security, few and crude technical options to access or influence the content of messages on the network. He or she could simply prevent the establishment of a circuit, possibly degrade the signal, or engage in some other more or less obtrusive form of discrimination against a customer. Customers tended to take a dim view of this, and the common carrier principle was relatively uncontroversial in practice.

Note that in the shift from circuit-switched to packet networks, network operators gave up a number of prerogatives they had previously enjoyed. Some examples may suffice. First, they surrendered much of their power to define,

7. There is a summary of the technical options for discrimination in Jon M. Peha, "The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy," (2007) 1 *International Journal of Communication* 644–668, at pp. 646–650, <<http://ijoc.org/ojs/index.php/ijoc/article/view/154/90>>. For a useful summary of options for blocking access, see Christian Sandvig, "Network Neutrality is the New Common Carriage," (2007) 9:2–3 *Info: The Journal of Policy, Regulation and Strategy* 136–147, <http://www.spcomm.uiuc.edu/csandvig/research/Network_Neutrality_is_the_New_Common_Carriage.pdf> at pp. 139–140.

sometimes subject to regulation, the standardized services they offered. Second, they surrendered distance-based billing. Third, they surrendered the prerogative of the “set-up” charge to establish a “long-distance” call. Fourth, they surrendered volume-based billing in favour of flat-rate or all-you-can-eat billing.

On the other hand, while the operator of a packet-switched network lost the opportunity to monetize certain characteristics of users’ traffic, it obtained a variety of technical options to unobtrusively influence the volume and nature of the signals on the network. When the operator uses that technical capability to treat different packet flows, or classes of flows, differentially, the practice is known as “policy-based routing.” As we shall see, operators may have various incentives to engage in such a practice.

If a rigorous common carrier principle holds, the end-to-end principle will be respected. The network neutrality debate turns on the eventuality that the provision of internet services may not attract, or may elude, the full protection of common carrier principles as traditionally understood. In such a case, what regulatory protections, if any, are required to frame the rights of network operators as against the rights of internet users? This question in turn begs the question: what public interest objectives should guide the assessment of the necessary regulations?

There are three objectives which appear and reappear behind the specifics of the network neutrality debate. The first is *freedom of expression*. The second is *consumer protection*. The third is *innovation and economic growth*. Much of the debate depends on the relative weight attributed to these objectives and on one’s view as to the likely fate of these objectives in the absence of incremental regulation.

The trade-offs inherent in this balancing of interests are complex and controversial to the extent that they are situated at the intersection of rapid technological development, explosive growth of the sector, and important economic, social, and cultural developments, all filtered through public law.

I am omitting from our analysis the possibility that the internet may become in some part a stage for service on the purely advertising-supported model of traditional television. Should consumers’ costs to access the internet be systematically defrayed by content or applications providers, the basic premises animating network neutrality advocacy would be violated by assumption, and the issues canvassed here would be largely defined out of the problem. To the extent that the consumer is no longer paying a fee for access to the full and ever-changing variety of services on the internet, but rather has chosen to accept free or significantly subsidized access to a defined subset of such services, he or she has already defected from the internet community. However, this might well raise issues under the *Broadcasting Act*. (See Part 5.)

Furthermore, there are some pathologies unique to the internet, notably spam, viruses, and network attacks, which are generally separable from the network neutrality debate because there is a consensus that available traffic management technology and denial of service (such as blockage of ports) may be deployed to combat these ills, without threatening the core public interests listed above.

3.2. "American and Canadian Legal Contexts"

BEFORE EXAMINING THE RELEVANCE OF INTERNET operations to the core interests at stake, we need to compare the American and Canadian legal contexts, which differ in important respects.

In the United States, a series of decisions by the Federal Communications Commission (FCC) and the Supreme Court have ruled that internet services are "information services," and therefore that they are not subject to the common carrier protections for content transmitted on public communications networks.⁸ This has opened up the question of carrier/provider prerogatives to modify content and applications offered over the internet, and resulted in intense lobbying and academic discussion,⁹ which has in turn spread to other jurisdictions.

The FCC has generally used a light hand on the internet. However, in August 2005, it did offer, as non-binding policy, four principles for protection of consumer access to the internet:

- 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 their choice of legal devices that do not harm the network; and
- 4) Consumers are entitled to competition among network providers, application and service providers, and content providers.¹⁰

In Canada, however, the legal context is different. Section 36 of the *Telecommunications Act*¹¹ requires carriers to respect traditional common carrier constraints, subject to the discretion of the CRTC:

Except where the Commission approves otherwise, a Canadian carrier shall not control the content or influence the meaning or purpose of telecommunications carried by it for the public.

Furthermore, section 27(2) of the *Telecommunications Act* confers broad powers on the Commission to police the exercise of discrimination by carriers:

8. *National Cable & Telecommunications et al v. Brand X Internet Services* (USA SC, 2005), <<http://www.law.cornell.edu/supct/pdf/04-277P.ZO>>, 545 *United States Supreme Court Reports* 967. There is a full discussion in US, Federal Trade Commission (Internet Access Task Force), *Broadband Connectivity Competition Policy* (June 2007), <<http://www.ftc.gov/reports/broadband/v070000report.pdf>> at pp. 37–50 [*Broadband Connectivity Competition Policy*]. Sandvig, *supra* note 7, argues that the American demand for network neutrality revisits the common carrier issues of the latter half of the previous century.

9. For a recent and even-handed summary of the debate, itself directly accessible through the notes, see Rob Frieden, "Internet 3.0: Identifying Problems and Solutions to the Network Neutrality Debate," (2007) 1 *International Journal of Communication* 461–492, <<http://ijoc.org/ojs/index.php/ijoc/article/view/160/86>>.

10. Federal Communications Commission, News Release, "FCC Adopts Policy Statement: New Principles Preserve and Promote the Open and Interconnected Nature of Public Internet," (5 August 2005), <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-260435A1.doc>.

11. *Telecommunications Act*, (1993) *Statutes of Canada*, ch. 38, <<http://laws.justice.gc.ca/en/ShowFullDoc/cs/T-3.4//en>> [*Telecommunications Act*].

No Canadian carrier shall, in relation to the provision of a telecommunications service or the charging of a rate for it, unjustly discriminate or give an undue or unreasonable preference toward any person, including itself, or subject any person to an undue or unreasonable disadvantage.¹²

The CRTC has hitherto concluded that the combination of these two statutory provisions provides it with sufficient powers to regulate the issues associated with network neutrality.¹³ It follows that while there is no reason for Canadians to be indifferent to or uninformed about the issue of network neutrality, the nature of any possible policy response ought to be evaluated in light of a legal environment different from that which obtains in the United States. In this article, therefore, I refer to the American literature when it illuminates the Canadian situation and omit a large amount of material which is best understood as part of the uniquely American construction of the issue.

I note that in the *Telecommunications Policy Review Panel Final Report 2006*, the panel concluded that “the broad prohibitions of ss. 27(2) against unjust discrimination and undue or unreasonable preferences are much too general and rely too greatly on the regulator’s discretion.”¹⁴ Accordingly, Recommendation 3-13 of the Final Report recommended that section 27 of the current statute be dropped and replaced by “more specific measures.” The panel then addressed a “more specific measure” to the question of access to the internet:

The *Telecommunications Act* should be amended to confirm the right of Canadian consumers to access publicly available Internet applications and content of their choice by means of all public telecommunications networks providing access to the Internet. This amendment should

- a) authorize the CRTC to administer and enforce these consumer access rights,
- b) take into account any reasonable technical constraints and efficiency considerations related to providing such access, and
- c) be subject to legal constraints on such access, such as those established in criminal, copyright and broadcasting laws.¹⁵

12. *Telecommunications Act*, *supra* note 11, s. 27(2).

13. See, for example, CRTC, Telecom Decision 2005-28, “Regulatory framework for voice communication services using Internet Protocol,” (12 May 2005) at paras. 448–483, <<http://www.crtc.gc.ca/archive/ENG/Decisions/2005/dt2005-28.htm>> and Telecom Commission Letter 8622-P49-200610510 (24 August 2006), <<http://www.crtc.gc.ca/archive/eng/letters/2006/lt060824.htm>>. However, there is concern in Canada over network neutrality, best followed through Michael Geist’s blog, <http://www.michaelgeist.ca/component/option,com_topics/task,view/id,0/Itemid,101/>. See also Michael Geist, “Telecommunications Policy Review Submission,” (August 2005) at pp. 4–7, <[http://www.teletude.ca/epic/site/tprp-gecrt.nsf/vwapj/Geist_Michael.pdf/\\$FILE/Geist_Michael.pdf](http://www.teletude.ca/epic/site/tprp-gecrt.nsf/vwapj/Geist_Michael.pdf/$FILE/Geist_Michael.pdf)> [Geist, “Telecommunications Policy Review Submission”]; and Neil Barratt and Leslie Regan Shade, “Net Neutrality: Telecom Policy and the Public Interest,” (2007) 32:2 *Canadian Journal of Communication* 295–305, <http://www3.fis.utoronto.ca/iprp/cracin/publications/pdfs/final/Barratt_Shade-CJC_Net_Neutrality.pdf>.

14. Industry Canada, *Telecommunications Policy Review Panel Final Report*, (2006) at p. 3-21, <[http://www.telecomreview.ca/epic/site/tprp-gecrt.nsf/vwapj/report_e.pdf/\\$FILE/report_e.pdf](http://www.telecomreview.ca/epic/site/tprp-gecrt.nsf/vwapj/report_e.pdf/$FILE/report_e.pdf)> [Final Report].

15. Recommendation 6-5 of *Final Report*, *supra* note 14 at p. 6-18.

Under either the current or the review panel's recommended legal context, a substantial degree of discretion remains with the Commission. It is thus no waste of energy to examine network neutrality in further depth, in order to consider how the Commission might exercise that discretion.

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4. THE ISSUE IN PRACTICE

NETWORK OPERATORS SEE THE ADVOCATES OF NET NEUTRALITY as hypostatizing a neutral network, fully respecting the end-to-end principle, which never really existed and certainly does not exist now. Is the network neutral? There are at least three reasons today's networks are not neutral.

First, the requirements of network management in the face of evolving demand on the network end up violating the end-to-end principle. The internet was never designed for the kind of high bandwidth and/or low latency applications of the twenty-first century. For example, on-line gaming or Voice over Internet Protocol (VoIP) requires real-time delivery of all of the packets carrying the video and audio messages from either end to the other. If packets are delayed or signals distorted (causing "jitter") due to congestion, the end-user will experience degraded service.

According to Sandvine, a vendor of traffic management technology, "peer-to-peer" applications constitute over 50% of network traffic.¹⁶ File-sharing (a peer-to-peer application) requires enormous bandwidth, with an average file size on the order of 100 megabytes (MB). This 50%+ of traffic is generated by a small minority of users. If a small number of users engage in file-sharing and thus strain the capacity of the network, other users may experience inferior quality service in the form of delay. The uncontested conventional wisdom is that less than 20% of internet customers are responsible for more than 80% of the traffic.

The orthodox economic solution to this challenge would be to levy usage-sensitive prices, which would internalize cost to its causal agents. If usage-sensitive pricing regimes for internet access (often called "customer tiering" or "consumer tiering") were widely available, many of the issues at the heart of the network neutrality debate would be attenuated, if not extinguished. The problem is that thus far, network operators have concluded that the costs of usage-sensitive pricing—in technology, marketing, and customer relations—exceed its advantages. As a consequence, internet service providers engage in minimal market segmentation and offer one, or at best a few, flat-rate(s), or all-you-can-eat price(s).¹⁷ They have recourse to other methods of controlling demand on the network.

Network operators do not as a rule offer service level guarantees to

16. Dave Caputo (President and CEO, Sandvine), "How Intelligent is Your Broadband Network?", Presentation at the Canadian Telecom Summit, Toronto, June 2006.

17. Christopher Yoo, "Network Neutrality and the Economics of Congestion," (2006) 94:6 *The Georgetown Law Journal* 1847–1908, <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=825669#PaperDownload> at pp. 1852–1854, 1863–1874; Gerald R. Faulhaber, "Network Neutrality: The Debate Evolves," (2007) 1 *International Journal of Communication* 680–700, <<http://ijoc.org/ojs/index.php/ijoc/article/view/151/85>> at pp. 687–691.

versions of this approach are network configurations known as “content-delivery networks.”²¹ These are not options open to any but the financially successful minority. They constitute an existing contradiction to the principle of the neutral network, insofar as ease of access can be purchased, by conferring a service advantage on the purchaser. Caching and content delivery networks are another manner in which the network is voluntarily configured by content and application providers, and not on the initiative of network operators, in a way that contradicts the classic principle of network neutrality.

Third, network operators need to be able to minimize the load on their backbone infrastructure. They argue that it is not their obligation to transport outbound traffic other than their own, which is to be terminated on their network, and other than the traffic of network operators or content providers with which they have traffic-peering arrangements or with which they have contracted to transport traffic for a fee (“paid transit”). Packets which do not fall into the above categories may be routed out of the proprietary network as soon as possible—so-called “hot-potato” routing. Load shedding through hot-potato routing is a third way in which current networks are far from neutral.

The network operators argue, therefore, that current networks are not neutral, that arguments for network neutrality are based on a mythical Arcadia, and that the end-to-end principle has always been honoured in the breach.²² The future of the network, they say, depends upon a relationship between revenue and capital investment which network neutrality regulation would compromise. They claim that exploding demand is straining infrastructure and requiring very large network investment in response. If network operators cannot recover their capital investment because network neutrality regulation prevents them from doing so, then the internet would be in peril.

They further argue that the unpredictable growth of demand and cyclical variations therein make it inevitable that there will be lags in investment and thus moments when congested networks threaten levels of service. They thus need to be able to manage demand and its effects on end-users through traffic shaping, in order to ensure minimum service levels for the majority of users. To the extent that network neutrality regulation would prevent traffic

21. Wikipedia, “Content delivery network,” <http://en.wikipedia.org/wiki/Content_Delivery_Network>.

The internet was designed according to the end-to-end principle. This principle keeps the core network relatively simple and moves the intelligence as much as possible to the network end-points: the hosts and clients. As a result the core network is specialized, simplified, and optimized to only forward data packets. Content Delivery Networks augment the end-to-end transport network by distributing on it a variety of intelligent applications employing techniques designed to optimize content delivery. The resulting tightly integrated overlay uses web caching, server-load balancing, request routing, and content services.

See also Nicholas G. Carr, “On the Edge: An Interview with Akamai’s George Comrades,” (2000) 78:3 *Harvard Business Review* 118–125.

22. See Craig McTaggart, “Was the Internet Ever Neutral?” (30 September 2006) (Prepared for the 34th Research Conference on Communication, Information and Internet Policy), <<http://web.si.umich.edu/tprc/papers/2006/593/mctaggart-tprc06rev.pdf>>; and see Robert W. Hahn and Robert E. Litan, “The Myth of Network Neutrality and What We Should Do About It,” (2007) 1 *International Journal of Communication* 595–606, <<http://ijoc.org/ojs/index.php/ijoc/article/view/161/87>>; as well as Christian Sandvig, “Shaping Infrastructure and Innovation on the Internet: The End-to-End Network that Isn’t,” in David H. Guston and Daniel Sarewitz, eds., *Shaping Science and Technology Policy: The Next Generation of Research*, (University of Wisconsin Press, 2006) <http://www.spcomm.uiuc.edu/csandvig/research/Communication_Infrastructure_and_Innovation.pdf>.

shaping, it would constitute a disservice to allow the small minority of very heavy users to externalize their costs onto the large majority of users.

Advocates of network neutrality see the ability of network operators to exercise discretion among sources of content and applications as a threat to the democratic, open, and accessible qualities of the internet, which they see as constitutive of the internet phenomenon and its multiplicity of benefits. They argue that this discretion should be constrained by regulation in order to protect the social and cultural dynamism of the internet. They identify three types of abuses that network neutrality should prevent.

First, network operators should not be able to pick and choose among the websites or applications which users may legally wish to access. They should not be able to block access to sites containing information critical of corporate behaviour or threatening corporate interests. They should not be able to block access to the advertisements or websites of competitors. They should not set themselves up as guardians of public morality or community values. In short, network operators should not engage in any sort of discrimination within or censorship of internet content without a legal mandate to do so.

Second, network operators should not be able to confer any preference on content or applications from corporate affiliates, or from providers which have paid for such preferential treatment. Network operators are often simultaneously Information Service Providers (ISPs), that is, suppliers of both telecommunications infrastructure (referred to as "facilities-based" suppliers) and internet access. They also may offer services, such as portals, email, or voice telephony, which compete directly with services offered by others over the internet. Network operators should not be able to favour their own VoIP services over those of competitors, for example. Nor should they be able to contract with Microsoft, for example, and then provide Microsoft with preferential treatment to the disadvantage of other players. This kind of traffic management is sometimes called "active discrimination."

Network neutrality advocates fear, with some anecdotal evidence from America and Canada²³ at hand, that network operators may seek to share the supranormal profits enjoyed by a small minority of internet providers—as though a Nike or a Spalding could claim a share of a star athlete's giant contract. Neutrality advocates' concern is not to protect the eBays of this world, but to ensure that new application and content providers are not deprived of a fair chance to introduce their offerings to users because rent-seeking network operators are free to discriminate in favour of larger established players. They say such an internet regime would be "access tiering," resulting in a "two-tiered internet."

Third, network operators should not be able to use traffic management technology to exercise discretion over types of applications, sources of applications, or sources of network traffic. In short, there should be no policy-based routing and no traffic-shaping. Implicitly, as demand increases, it is the network operators' responsibility to build the infrastructure to meet it.

23. Alexander Panetta, "Videotron wants Expansion Costs Shared," (1 November 2006) *The Gazette*, Montreal at p. B7.

The Coalition of Quebec Internet Service Providers has summarised the network neutrality doctrine in “four essential features”:

- 1) non-discriminatory routing of packets;
- 2) user control and choice over service levels;
- 3) ability to create and use new services without prior approval of network operators; and
- 4) non-discriminatory peering of backbone networks.²⁴

Thus, while the existing internet may not fully respect the end-to-end principle, and, hence, there is no such thing as a neutral internet, this does not necessarily deprive network neutrality of its relevance as a regulative ideal. The issue, it becomes evident, is not whether a classically neutral network is feasible, since it is not. Rather, the issue becomes, what regulation, if any, does the internet need to balance and protect the public interests at stake in the network neutrality debate?²⁵

Let us return, then, to the three core public interests which lie behind the network neutrality debate. The first public interest is *freedom of expression*. There are a number of public interest objectives, such as the prevention of crime, hate speech, pornography, pedophilia, and sexual predation; the protection of intellectual property and national security; and the policing of defamation, the pursuit of which is complicated by the technical features of the internet. They raise difficult issues of principle which are similar to those they raise in society at large. Their resolution will call upon the same publicly accountable institutions of legislation and enforcement which are responsible for establishing and applying the statutes governing communication for pernicious purposes in other media. However contentious, these issues are marginal to the network neutrality debate.

The residual issue of principle is not complex. TELUS became exhibit number one of network neutrality abuse in the summer of 2005, when it briefly blocked access to a website which listed personal information of employees who were not respecting picket lines in the course of a long strike. TELUS claimed that it was acting to protect these employees. TELUS spokespersons have since had to account for this action in many public fora and have, on at least one occasion, accepted that it was a “mistake.”

Michael Geist has argued, “Given the importance of the neutrality principle, it is surprising to learn that Canadian law does not appear to currently provide a definitive legal requirement to maintain such neutrality. [...] The Telus incident demonstrated that Canadian law does not provide sufficient support for such a principle.”²⁶ Geist gives no further grounds for his conclusion. But Canadian law never came to grips with the Telus case, which created such a

24. Coalition of Quebec Internet Service Providers, “Comments on the Draft Direction to the CRTC,” (Memorandum to the Minister of Industry and the Director General, Telecommunications Policy), (16 August 2006), <<http://www.tmdenton.com/pub/interventions/policy%20directive%20final.pdf>> at p. 34.

25. For an attempt to identify a set of answers to this question, generally consistent with those in the balance in this article, see Frieden, *supra* note 4 at pp. 203–216.

26. Geist, “Telecommunications Policy Review Submission”, *supra* note 13 at pp. 5–6.

future that Telus restored access in a matter of hours. The conduct in question was offensive to fundamental values, and appeared *prime facie* to be a violation, but its status under law was never tested.

There are no grounds of principle for delegation to a network operator of a general discretion to determine material to which the public should or should not have access. Absent a statutory mandate, blocking access to websites by network operators or internet service providers is unacceptable in a democratic society. There is no obvious reason to conclude that this dimension of network neutrality, simply as a function of the fact that the conduct in question occurs on the internet, somehow eludes the powers of the Commission conferred in section 36 of the Act.²⁷

The second public interest raised by network neutrality is *consumer protection*. Network operators argue that they need to engage in traffic shaping in order to ensure that the large majority of users do not experience degraded service because of the very high bandwidth demands of the minority. Network neutrality advocates are concerned that this prerogative rests in the hands of a commercial enterprise whose objectives may not coincide with the public interest in an open and accessible internet, and who may not easily be held accountable for its use.

In late 2005, Cybersurf applied to the Canadian Radio-television and Telecommunications Commission (CRTC) for resale access to a quality of service products which Shaw was offering to customers on its network subscribing to non-Shaw Voice-over-Internet (VOIP) services. Interveners claimed that this particular Shaw service constituted a violation of network neutrality, in that Shaw was anti-competitively conferring a preference on itself, by attempting to raise the effective price of telephony services which were competitive to its own, and possibly using policy-based routing to erode the performance of competing services. Whatever Shaw's motivation, the CRTC found that Shaw was not using packet inspection technology, nor was it giving any preference to its own traffic relative to that of any other service provider.²⁸

There are a number of considerations that must be weighed. A basic premise of consumer protection policy is that information is expensive. Consumers have, individually, a small (but genuine) incentive to acquire the relevant information, and producers of that information may have a large incentive not to furnish it. Policy-makers seeking to protect consumers can rarely go wrong paying attention to the transparency of offerings in the market place. In this case, prominent, plain-language explanations of traffic management policies would appear appropriate.²⁹

There are good reasons to assume limits on consumer choice in the

27. *Telecommunications Act*, *supra* note 10.

28. Canadian Radio-television and Telecommunications Commission, Telecom Decision CRTC 2006-61, "Access to Quality of Service Enhancement Service of Shaw Cablesystems G.P. (Shaw) and PacketCable functionality of Rogers Communications Inc., Shaw, and Vidéotron ltée.," (21 September 2006), at paras. 23-24, <<http://www.crtc.gc.ca/archive/ENG/Decisions/2006/dt2006-61.htm>>.

29. See the discussion in OECD2, *supra* note 1 at pp. 30-33, and *Broadband Connectivity Competition Policy*, *supra* note 7 at pp. 130-134.

supply of broadband internet access.³⁰ About 7% of Canadians do not have access to terrestrial broadband today, although most Canadians have access to high speed satellite service, at prices higher than those levied by terrestrial suppliers. Of the balance of consumers, an unknown but significant number have access to only one terrestrial broadband network. The remaining consumers have an effective choice between cable modem or Digital Subscriber Line (telephone company) offerings. None of these market configurations, even leaving aside the cost to the consumer of switching suppliers, provides any comfort that network operators will be incented to provide full information. Should network operators not prove ready to provide the requisite clear and comprehensible information about limitations on usage to consumers, there is a case for regulation.³¹

The third core public interest raised in the network neutrality debate is *innovation and economic growth*. Network neutrality advocates fear the possibility that network operators may contract with content or application providers to provide their packets with preferential treatment. Network operators want to leave this “access tiering” option unregulated. They argue that the capital investment required to accommodate the rapid growth of the internet requires the commercial freedom to recover such investment. They argue that attempting to regulate will inevitably result in unanticipated consequences, including inhibition of precisely the innovation that network neutrality advocates claim to want to foster. In the end, network operators want to be free to manage without regulatory constraint, the trade-off between expanding capacity to meet peak demand and shaping traffic to optimize service at current capacity.³² In a sufficiently competitive market, this trade-off should indeed be determined by the market, not by policy.

Network operators claim that consumers will not tolerate being dictated to as to which content or application provider will enjoy priority on their internet access service.³³ Network operators argue that content or application providers enjoy substantial countervailing power to negotiate with them, and therefore, that regulation is hardly necessary. Google is no less important to any network operator than the network is important to Google.³⁴ They argue that regulation

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30. According to Martin Cave, Ulrich Stumpf, and Tommaso Valetti, in their assessment of telecom markets in a “representative Member state” of the European Commission, even where cable competes with Digital Subscriber Line, “the possibility of joint cable-DSL dominance cannot be ruled out. There are thus grounds for anticipating market failure problems (i. e. S[ignificant] M[arket] P[ower]) in non-mobile retail broadband markets.” Martin Cave, Ulrich Stumpf, and Tommaso Valetti, “A Review of certain markets included in the Commission’s Recommendation on Relevant Markets subject to ex ante Regulation,” July 2006, at p. 75, <http://ec.europa.eu/information_society/policy/ecomms/doc/info_centre/studies_ext_consult/review_experts/review_regulation.pdf>.
31. Information aside, the industrial structure of the last mile market forms the central focus of the net neutrality debate between Christopher Yoo and Timothy Wu, “Keeping the Internet Neutral?,” (1 May 2006) *Legal Affairs*, <http://www.legalaffairs.org/webexclusive/dc_printerfriendly.msp?id=86>.
32. See *Broadband Connectivity Competition Policy*, *supra* note 8 at pp. 86–88.
33. Note that consumers are already living with differential access resulting from investment in caching by the providers themselves.
34. An indication of the resources available to players such as Google is that Google is reportedly acquiring dark fibre and spectrum as a part of its strategy to maintain unfettered access to consumers. See Research and Markets, “Google’s Telecom Strategy—The Impact of Google as a Disruptive Force in the Wireless and Broadband Space,” (April 2007) <http://www.researchandmarkets.com/product/02f059/googles_telecom_strategy_the_impact_of_google> and Kim Hart, “FCC to Rule on Wireless Auction: Lobbying Intense As Google Seeks To Open Market,” (30 July 2007) *Washington Post* at p. A01, <<http://www.washingtonpost.com/wp-dyn/content/article/2007/07/29/AR2007072901259.html>>.

will compromise the ability of the industry to fashion by negotiation and experiment with the best ways to solve the challenges of the growth and development of the internet. Finally network operators emphasize that despite what is now roughly three years of debate, neutrality advocates cannot cite any specific instance of an abusive commercial practice on the part of a network operator which has proven to be beyond the scope of current statutory and institutional arrangements.

At the moment, there is no evidence in Canada that agreements between content or application providers and network operators for preferential treatment of the former by the latter have been concluded. Assume, in accordance with our conclusion above, that network operators will disclose, or be required by regulation to disclose, in clear and plain language, any network management practices that may impact on the accessibility, speed, or type of applications which consumers can expect to experience on their networks resulting from such an agreement (see below). What further protections might the prospect of commercial preference agreements require?

The most obvious incentive here is for an operator to favour only one provider of a popular type of application or content—under affiliated ownership or by contractual arrangement. This is the kind of agreement that would be most valuable to the provider in question and it is the type of arrangement that search engines have apparently already made with content providers. The difference is that the consumer has a broader range of choices in the case of search engines than in the case of network operators. In the latter case, given the concentration in the industry, even transparent service offerings could include limits on customer choice in popular applications or content, which would represent an unacceptable tying of the application or content to the internet access offering, a form of vertical foreclosure of competition.

One remedy which has been proposed in such cases is the following: to the extent that a type of application or content is to be prioritised or constrained, other than consequent to a legal mandate, *all* of the packets of that type of application or content should be treated the same way, regardless of the source. This framework attempts to permit need-based traffic management while excluding active discrimination.³⁵

It should be noted that because the internet is a confederation of thousands of independent networks, the ability of any given network operator to deliver a certain quality of service is highly sensitive to the specific service topology of the content or application provider and its market.³⁶ The larger and more successful the content provider, the more potentially attractive it would be as a client for the network operator; but so too would its customer base be that much larger and more geographically diverse. The larger and more geographically diverse its customer base, the less leverage any single network operator will have on the quality of service experienced by its customers.

Network neutrality advocates, especially non-facilities-based internet service providers, also argue that network operators should not be able to

35. Paul Ganley and Ben Allgrove, "Net Neutrality: A User's Guide," (2006) 22:6 *Computer Law and Security Report* 454–463, <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=925693> at p. 458 and *Broadband Connectivity Competition Policy*, *supra* note 8 at pp. 55–56, 88–92.

36. OECD2, *supra* note 2 at pp. 9, 13–14, and Frieden, *supra* note 4 at pp. 179–180, 184–192.

exercise commercial discretion with respect to backbone peering (exchange of traffic) arrangements, but rather should be required to peer with any backbone operator which so requests. In effect, they argue that the importance of diversity in the internet world justifies the regulation of internet protocol (IP) backbone facilities as if they were essential or bottleneck facilities. Network operators respond that as a matter of fact, IP backbone facilities bear no relationship to essential facilities—there is no practical or regulatory limit on the development or ownership of such facilities, nor is there evidence of anti-competitive conduct.³⁷

Whatever the oligopolistic characteristics of the supply of retail internet access, it is difficult to see the policy justification for *ex ante* regulation of internet backbone. One would have to regard smaller internet service providers as so culturally or socially important as to require competition policy remedies to protect their interests, even though the relevant market does not appear to meet the competition policy tests for the application of those remedies.³⁸ That case has not yet been made.

What does all this amount to? Few of the practices allegedly constituting abuses of network neutrality have been substantiated by courts or regulators. Yet given the market structure for last mile internet access, there can be no guarantees that an industry which is, at best, a duopoly, may not leverage its market power in anti-competitive ways. Information remains the best place to start.

Frieden proposes that facilities-based internet service providers (ISPs) should adopt a series of commitments to disclosure, and a set of practices that might well foreclose unwanted regulatory intervention. Major ISPs should “[...] disclose their peering and transiting policies, as well as offers and acceptances of Service Level Agreements that deviate from best efforts routing.”³⁹ In addition, ISPs should make the following commitments:

- an affirmative obligation not to drop packets and create congestion when actual traffic conditions do not necessitate such action;
- no retaliation through targeted degradation in service quality for any network user that has refused to pay for premium services;
- no port blocking and other refusals to deliver traffic onward to another ISP or the intended recipient except when such action would violate laws or cause harm to the ISP’s or other ISPs’ networks;
- make available any better than best efforts [service level agreement] to any similarly situated customer;
- not to override firewalls, filters and other traffic management technologies made available to customers or installed by customers, except when such action would violate laws or cause harm to the ISP’s

37. See Frieden, *supra* note 4 at pp.179–180, 184–197.

38. See Economides, “The Economics of the Internet Backbone,” in Sumit Majumdar, Ingo Vogelsang, and Martin Cave eds., *Handbook of Telecommunications Economics, Volume 2, Technology Evolution and the Internet*, *supra* note 2 at pp. 375–410 and Frieden, “The Potential for Scrutiny of Internet Peering Policies in Multilateral Forums,” in Benjamin Compaine and Shane Greenstein, eds., *Communications Policy in Transition: The Internet and Beyond*, *supra* note 3 at pp. 159–193. Richard Collins is not as sanguine as Economides and Frieden. See Richard Collins, “Internet Governance in the UK,” (2006) 28:3 *Media, Culture & Society* 337–358, at pp. 349–350, <<http://mcs.sagepub.com/cgi/content/abstract/28/3/337>>.

39. Frieden, “Internet 3.0,” *supra* note 9 at p. 490.

- or other ISP's networks; and
- no intentional failures to comply with existing Service Level Agreements executed with end-users, peers and transiting customers.⁴⁰

Finally, Frieden argues that the Federal Communications Commission (FCC) should mandate reporting requirements regarding ISP traffic to get "[...] a better sense of how often network congestion occurs and what circumstances trigger poor service." This would equip the FCC with "a better capability for determining when an ISP has artificially created congestion" or corroborate an ISP's "assertion that it did nothing to degrade overall service, or target specific bitstreams for inferior service."⁴¹

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5. BROADCASTING AND NETWORK NEUTRALITY

THE CANADIAN DEBATE ABOUT NETWORK NEUTRALITY is likely to involve not only the *Telecommunications Act* but also the *Broadcasting Act*. As TCP/IP based networks appear to many to represent the logical evolution of ubiquitous broadcast distribution, some audiovisual programmers and the variety of interest groups dependent upon them have begun to voice demands that the CRTC should extend the premises of broadcasting distribution undertaking (BDU) regulation to internet carriage of broadcasting content as contemplated in the *Broadcasting Act*.⁴²

To the extent network operators such as Sasktel and MTS-Allstream are already licensed as BDUs and use private (or "managed") TCP/IP based networks to deliver programming to specific subscribers for compensation (this is often referred to as IP television), they are already subject to such regulation.⁴³ However, there is no obvious limitation to any content providers' access to the public internet for the purpose of offering broadcasting and broadcast-like content, and it is this unlicensed provision that has alarmed some Canadian programming and production interests.

Note first that the regulatory solutions described above, particularly discrimination by category of traffic rather than by source, should logically apply to unlicensed broadcasting using the internet as a distribution channel. In particular, content from sources affiliated with network operators or contracted with them should not be treated preferentially to similar types of content from unaffiliated or uncontracted sources. Any broadcasting content provider would have the option to emulate Google or Microsoft by investing in content delivery networks in order to improve access to its programming, just as the over-the-air broadcasters extended their geographical reach with antennae and towers.

The issue which remains is whether there are reasons for network neutrality-type regulation under the *Broadcasting Act*, above and beyond

40. Frieden, "Internet 3.0," *supra* note 9 at p. 490.

41. Frieden, "Internet 3.0," *supra* note 9 at pp. 490–491.

42. See Konrad von Finckenstein, "Notes for an Address to the 2007 Broadcasting Invitational Summit," (26 June 2007), <<http://www.crtc.gc.ca/ENG/NEWS/SPEECHES/2007/s070626.htm>>.

43. Bell Canada, Aliant and TELUS also have BDU licences but have not achieved large-scale market penetration for their services.

regulation under the *Telecommunications Act* (as previously discussed in Part 3.2).

Broadcasting regulation was founded in part on the premise that since licensees, both programmers and cable television providers, foster access to American programming by Canadian viewers, then programmers and BDUs should contribute resources to supporting Canadian production, a merit otherwise handicapped by a Canadian market which is sub-economic in scale for competitive production values in popular entertainment. Consumers manifestly wanted access to American programming, policy-makers willed Canadian programming, so a variety of innovative regulatory provisions leverage revenue from American programming for the benefit of Canadian production and carriage.

Historically, the key element in this regulatory bargain has been the acquisition of rights to American series and made-for-television movies (so-called "high-end" programming) by Canadian broadcast licensees, who then use part of the revenue obtained from the sale of advertising during popular American programming to support Canadian production.⁴⁴ The market for rights, and not the variety of technical alternatives for audiovisual distribution theoretically opened up by the internet, remains the issue currently critical to the achievement of the objectives of the *Broadcasting Act*.

The demand for network neutrality-type regulation under the *Broadcasting Act* is a demand for the *orderly marketing of audiovisual content* in order to preserve the integrity of the Canadian rights marketplace, rather than freedom of expression, consumer protection, or economic growth and innovation. As such, it is in fact a debate distinct from the network neutrality debate. It is about the continued marketing of rights to major television properties on the basis of national boundaries, that is, the continued use of and respect for the form of distribution on which the current broadcasting business model is based. In particular, it is about a demand for protection of the regulatory dividend to Canadian television production under the current business model.

The practice which respects national boundaries when audiovisual material is distributed on the internet is known as "geo-gating" or "geo-blocking." Geo-gating prevents internet users situated outside the national boundaries of the country for which the distributor has acquired rights from accessing copyright material. To the extent that geo-gating remains generally effective and rightsholders employ it to respect territorial limitations on rights, the issues surrounding network neutrality and broadcasting become clearer.

Section 3(1)(b) of the *Broadcasting Act* declares that, "the Canadian broadcasting system [...] provides [...] a public service essential to the maintenance and enhancement of national identity and cultural sovereignty."⁴⁵ Section 3(1)(d) sets out a detailed enumeration of the meaning of "national identity and cultural sovereignty" in this context.⁴⁶ In 1999, the Commission concluded that new media ("[...] those undertakings that provide broadcasting services delivered and accessed over the Internet"⁴⁷) should be exempt from

44. The "high end" production requiring support is primordially Canadian drama, the Canadian audiences for which are insufficiently large to earn advertising revenue covering its cost of production. This is, in general, not the case for Canadian news and sports.

45. *Broadcasting Act*, *supra* note 1 at s. 3(1)(b).

46. *Broadcasting Act*, *supra* note 1 at s. 3(1)(d).

47. Public Notice CRTC 1999-197, "Exemption order for new media broadcasting undertakings," (17 December 1999), <<http://www.crtc.gc.ca/archive/eng/Notices/1999/PB99-197.htm>> [Public Notice].

regulation because they would “[...] not contribute in a material manner to the implementation of the broadcasting policy set out in section 3(1) of the Act.”⁴⁸

What about today’s potential applications of traffic management technology and today’s internet broadcasting? Assuming the network neutrality principles described above within the context of the *Telecommunications Act* are respected, what, if anything, might be required to support national identity and cultural sovereignty, as traditionally construed under broadcasting regulation?

One of the best informed observers of the Canadian broadcasting system, Peter Grant, has recently noted that:

[T]he Canadian broadcast marketplace for programs is distinct from the United States. And copyright owners on both sides of the border generally want to keep it that way. [...] [I]nsofar as the integrity of the Canadian rights market is concerned, there is little support from any of the major players in the industry for any significant change in the policies supporting it. And contrary to popular opinion, neither the advent of direct broadcast satellites nor the introduction of the high speed Internet access have eroded the strength of the Canadian broadcast sector in practice.⁴⁹

In effect, Grant observes that producers remain convinced that multiple exhibition windows and the differentiation of markets are required to maximize returns and cover the production costs of programming.

A second evaluation of the issue, a report by Peter Miller for the CRTC, concluded in the same vein that, “Product is not generally being denied to Canadian broadcasters (certainly, it appears, none that is otherwise available on the Internet in the U.S.) [...]”⁵⁰ although with “[...] no clear business model [...]”⁵¹ negotiations have often foundered on price. Miller goes on to conclude:

[T]he overwhelming weight of evidence suggests that the separate Canadian (electronic media) rights market is under no immediate threat, and indeed that industry self interest, existing corporate structures and technological capability have if anything, strengthened that separate rights market by allowing popular online TV-like product to follow suit.⁵²

From Grant and Miller’s conclusions, and from the absence of any indication that the internet will be used to override national boundaries as a framework for the marketing of rights to high-end audiovisual products, it would not appear that the internet represents an imminent disruption to the traditional Canadian broadcasting business model. As long as the internet does not pave the way for

48. *Public Notice*, *supra* note 47.

49. Peter Grant, “Canadian Cultural Product and the Long Tail: The New Economics of Production and Distribution in Canada,” Presentation to the Law Society of Upper Canada Entertainment, Advertising and Media Symposium, (27 April 2007), <http://www.mccarthy.ca/article_detail.aspx?id=781>. Grant’s conclusions are based in part on the conclusions of the CRTC. See Canadian Radio-Television and Telecommunications Commission, “The Future Environment Facing the Broadcasting System,” (14 December 2006), <<http://www.crtc.gc.ca/ENG/publications/reports/broadcast/rep061214.htm>>.

50. Peter Miller, “An Overview of the Canadian Program Rights Market,” Report to the Canadian Radio-television and Telecommunications Commission, (5 July 2007), <<http://www.crtc.gc.ca/eng/publications/reports/miller07.htm>>.

51. Miller, *supra* note 50.

52. Miller, *supra* note 50.

the systematic infringement of rights to programming, or to the systematic disintermediation of Canadian broadcasters, the issue turns upon the threat which might constitute greater choice in audiovisual programming for Canadian consumers. It is clear that the internet will be a platform providing greater diversity of audiovisual content, but it is not, as of yet, clear whether the internet will constitute a means by which Canadian broadcasting policy may be undermined.

There will always be a debate about the extent to which national identity and cultural sovereignty are served by current methods of distribution. Traditional methods of simultaneous distribution, such as over-the-air, cable, and satellite, involved capacity limitations which the internet seems to have overcome, at least insofar as choice is concerned. (Current technology has not overcome all limits to loading bandwidth, as we have seen.)

With the effective removal of limits on the variety of choices available, so long as rights can be managed commercially, the rationale for the extension to the internet of traditional Canadian distribution regulation weakens substantially. This is the first issue, one of regulatory principle,⁵³ with which any demand for regulation of internet broadcast offerings will have to come to grips. In a universe of infinite choice, where Canadian content cannot be crowded out, what principle underwrites an attempt to structure consumers' exercise of that choice?⁵⁴

The second issue, one of practical feasibility, is precisely how any such structuring of consumer choice could be affected. The complexity and the technical decentralisation of the internet already frustrate the efforts of authoritarian countries to regulate their citizens' access to the internet, requiring huge investments of human and financial resources and draconian limitations on freedom to post and consume information. Exactly how would this challenge be resolved with the technical and policy instruments available to a democracy?

As Pierre Trudel has noted, "While it plays a major role, state law seems to be being replaced by other sources of norms; contracts, contractual practices and technological conditions seem to be crucial [...]. [N]etworks are increasingly replacing hierarchical institutions as locations where normativity is designed and stated [...]. [T]he network is the place of interaction, but also the place where normativity is developed, debated and applied." Thus, "[...] state law competes with other normativities. It seems easier than ever to circumvent rules or simply exempt oneself from them."⁵⁵

A policy argument in favour of the extension of BDU regulation to the internet (and the consequent potential application of traffic management constraints within such an extension) would have to be founded on: (1) an argument that the traditional system has been eroded by internet distribution of audiovisual content to the point that the current system can no longer fulfill its

53. For a valuable overview of the principles and reasons underlying regulation of media in the internet age, see Pierre Trudel, "Points of View on Governance and Media Regulation in the Context of Digitalization," in Daniel Giroux and Florian Sauvageau, eds., *The Confrontation of Old and New Media* (Sainte Foy, Québec, Centre d'Études sur les Médias, 2007), pp. 95–145.

54. On the fundamental importance to policy of the transition from the analog world of channel scarcity to the digital world of channel abundance, see Ellen P. Goodman, "Media Policy out of the Box: Content Abundance, Attention Scarcity, and the Failures of Digital Markets," (2004) 19:4 *Berkeley Technology Law Journal* 1389-1472, <http://www.btlj.org/data/articles/19_04_05.pdf>.

55. Nevertheless, "[I]t seems so naïve to say that state regulations have become obsolete. The fact that technological changes make it difficult to apply some laws does not automatically entail the disappearance of the reasons underlying their existence." See Trudel, *supra* note 53 at pp. 116–117.

obligations under the *Broadcasting Act* and CRTC regulations and policies (this argument is, according to those best able to judge, premature); or (2) an abandonment of the current distribution model by US producers or broadcasters in favour of an internet-based model in which, for example, HBO or ESPN programming were to be available only on the internet.

Either scenario is, at the moment, strictly speculative. Solutions must remain equally speculative. Should such a scenario materialize, it is far from clear that network management technology would prove equal to the task of shaping events toward a destination defined by policy. It would appear more feasible to augment subsidy for Canadian production than to attempt to preserve today's business model through a regulatory transplant from the centralized capacity-limited television/cable model of the twentieth century to the decentralized, infinite-choice broadband TCP/IP model of the twenty-first century.⁵⁶

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6. CONCLUSION

THE NETWORK NEUTRALITY DEBATE INVOLVES PUBLIC INTERESTS which merit serious attention, and neither indifference nor haste seems warranted. The absence of immediate cases directly threatening the core public interests at stake implies prudence in the formulation and application of remedies. This is the conclusion to which both the OECD Working Party on Telecommunications and Information Services Policies and the Federal Trade Commission Task Force on Internet Access arrived.

According to the OECD report on Internet Traffic Prioritisation:

There is little evidence of anti-competitive conduct to date and problems have typically been resolved quickly via market forces or through quick regulatory intervention in markets where they have appeared. [...] From the current state of the discussions it seems premature for governments to become involved at the level of network-to-network traffic exchange and demand neutral packet treatment for content providers.⁵⁷

The Federal Trade Commission Task Force concluded as follows:

[W]e advise proceeding with caution before enacting broad, *ex ante* restrictions in an unsettled, dynamic environment. [...] [W]e suggest that policy-makers proceed with caution in evaluating calls for network neutrality regulation, based on the indeterminate effects on consumer welfare of potential conduct by broadband providers and concerns with regulation in the area of broadband Internet access. No regulation, however well-intended, is cost-free, and it may be particularly difficult to avoid unintended consequences here, where the conduct

56. "[N]otwithstanding the explosion of media distribution channels, there will remain demand that media producers fail to satisfy. What will change is the degree to which traditional regulatory tools can be effective, particularly achieving proactive media policy goals. Media subsidies, as opposed to regulations, should be the preferred instrument of proactive media policy under conditions of content abundance and attention scarcity." Ellen P. Goodman, *supra* note 54 at p. 1393.

57. OECD2, *supra* note 2 at p. 5.

at which regulation would be directed largely has not yet occurred.⁵⁸

Should the American market in fact evolve in ways antithetic to the principles proposed here, there may be limits to the effectiveness of Canadian regulation in any given case. Indeed, the greater the degree of intervention implied by any given regulatory regime, the greater the probability that there will be technical or jurisdictional barriers to the effective enforcement of regulation. These limitations are inherent in the nature of the internet (not so long ago, many of today's advocates of network neutrality regulation were revelling in them).

There is ample justification in a policy demand for better, clearer, and more comprehensive information from ISPs about their network management practices and their service offerings. Should the industry show itself unprepared to supply such information, Industry Canada and the CRTC should assume responsibility for seeing that such information is publicly accessible.

The Canadian regulator would therefore be advised to monitor: (1) the service descriptions, pricing policies, and information disclosure affecting consumers in the market for internet access, and the costs to the consumer of switching suppliers; (2) the commercial relations and network management practices of network operators; (3) the industrial organization of the internet access market; (4) the evolution of traffic management technology; and (5) the evolution of markets for rights to high-end American television programming.

58. *Broadband Connectivity Competition Policy*, *supra* note 8 at p. 155.