Reply of

Campaign for Democratic Media

Telecom Public Notice CRTC 2008-19:

Review of the Internet Traffic Management Practices of Internet Service Providers

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Introduction

1. In accordance with the procedure set out in CRTC Telecom Public Notice CRTC 2008-19,[1] we offer the Reply submissions of the Campaign for Democratic Media (CDM).

2. We organize this Reply into three sections:
    a. Part I addresses policy considerations explicitly or implicitly identified in the Public Notice and addressed in Comments submitted to the Commission;
    b. Part II addresses internet traffic management practices, considerations and alternatives raised by third party Comments submitted to the Commission; and
    c. Part III addresses third parties' Comments' legal arguments in respect of interpretation of:
        i. the subsection 27(2) prohibition against unjust discrimination, and
        ii. the section 36 prohibition against controlling the content or influencing the meaning or purpose of telecommunications.

Part I Policy Arguments

3. In this Part of our Reply, we address three claims raised in Comments to the Commission:
    a. first, we reject assertions that the Commission has no role to play in establishing standards or practices for managing internet traffic on Canada's ISP networks;
    b. second, we reply to the manner in which parties have characterized the decision in *CAIP* v. *Bell*;[2] and
    c. third, we reply to arguments in respect of interpretations of:
        i. the policy objectives of the *Telecommunications Act*[3] set out in section 7 (the "Policy Objectives");

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[1] CRTC Telecom Public Notice 2008-19 [Public Notice].
[2] CRTC Telecom Decision 2008-108 [*Bell* v. *CAIP*].
[3] S.C. 1993, c. 38, T-3.4 (as amended) [*Telecommunications Act*].

ii. the Cabinet Policy Directive of December 14, 2006 (the "Policy Direction");[4] and

iii. the interplay between the Policy Objectives and the Policy Direction.

a) Legal Capacity to Regulate

4. At the outset, in general reply to the Comments of parties, CIPPIC and the CDM reiterate that there *is* a role for the Commission to play in regulating the traffic management practices of Canadian ISPs. Canadian ISPs *have* in the past unjustly discriminated against third parties in the provision of telecommunications services. Canadian ISPs *have* interfered with internet traffic for the purposes of controlling the content or influencing the meaning or purpose of telecommunications. There is no reason that Canadian ISPs cannot again engage in such conduct at some point in the future.

5. Past acts of internet traffic interference by Canadian ISPs constitute some of the most egregious violations of the principle of network neutrality in the world.

6. In 2005, TELUS blocked subscriber access to union website critical of TELUS.[5] The website contained constitutionally protected speech. Those expressing themselves on the site had not been found to have violated any law. TELUS claimed that the union website contained confidential information and was attempting to harass and intimidate workers by publishing their pictures. TELUS only subsequently obtained a court order prohibiting the union from posting photos with the intent of intimidating or threatening TELUS employees, contractors, customers, suppliers and others. The order did not authorize TELUS' actions or otherwise sanction blocking access to content.

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[4] Directive of Governor in Council's Order issuing a Direction to the CRTC on *Implementing the Canadian Telecommunications Policy Objectives*, P.C. 2006-1534, 14 December 2006 [Policy Direction].

[5] Sorcha McGinnis, "Future Not So Friendly – TELUS Blocks Union Website" Edmonton Sun (24 July, 2005)<online: http://www.edmontonsun.com/News/Canada/2005/07/24/1145417-sun.html>.

7. In 2006, Shaw sought to impose a $10 "enhancement" charge for VOIP users. services competing with their own offering.[6] This raised competitive concerns: Shaw's more expensive competitive VOIP service was made more economically competitive by the fee.

8. CDM submits that these two examples provide clear examples of unjust discrimination (against content in the case of TELUS and against applications service providers and their customers in the case of Shaw) and of interference with internet traffic motivated by a desire to control or influence content. CDM submits that these cases exemplify ISP behaviours that are simply beyond the pale: a consensus exists, in Canada and elsewhere, that regulators *should* disallow ISP interference in internet traffic on the basis of:
    a. its legal content, or
    b. anti-competitive considerations pertaining to third party services or applications that compete with services offered by the ISP (that is, services other than provision of basic internet access).

9. In both of these cases, the ISPs involved were motivated by considerations other than traffic management. However, even some "pure" traffic management behaviours are also clearly beyond the pale. For example, RST packet injection – resetting TCP connections without regard to network traffic load – has been found to violate the United States' Federal Communications Commission's regulatory framework as an "unreasonable traffic management practice".[7]

10. Again, CDM suggests that a consensus exists in Canada and elsewhere that this practice - masquerading as a users' computer and resetting the connection between the user's computer and that of the file recipient – is not a permissible internet traffic management

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[6] Mark Els, "Vonage says Shaw breaching net neutrality", ITWorldCanada.com (14 Mar 2006) <online: http://www.itworldcanada.com/Pages/Docbase/ViewArticle.aspx?id=idgml-8fb97dc8-19c4-4fca-b355-c07be1e7dea7>.

[7] *Free Press* v. *Comcast*, No. 08-183 (F.C.C. 2008), 2008 WL 3862114 <online: http://www.fcc.gov/Daily_Releases/Daily_Digest/2008/dd080820.html> [*Comcast*].

practice. CDM asserts that such a practice would violate the Act's prohibitions against unjust discrimination and controlling or influencing content.

11. CDM observes that Comcast, a cable service provider, targeted P2P applications for special treatment in its initial traffic management solution. P2P is a viable vector for the delivery of video content and accordingly competes with cable television. CDM urges the Commission to apply particular skepticism to any traffic management practices adopted by a Canadian ISP that targets P2P applications while serendipitously leaving untouched the ISP's competing video offering, whether online or offline.

12. The Commission enjoys the capacity to regulate the Canadian internet to uphold the principles of network neutrality. The CDM urges the Commission to use those tools where warranted.

b) CAIP v. Bell

13. The CRTC's 2008 decision in *CAIP* v. *Bell*[8] figures prominently in the Comments of several parties to this proceeding. For example, Bell's Comment begins in paragraph 4 with a summary of that proceeding, and continues in paragraph 5 with the following statement:

> The Commission further noted that Bell Canada has established that P2P file-sharing applications can make disproportionate use of the network such that the traffic shaping approach that Bell Canada has implemented on its network is the only practical option that is technologically and economically suitable, at this time, for addressing congestion in its DSL network. Finally, the Commission determined that Bell Canada's traffic-shaping practices did not violate sections 27(2) or 36 of the Act.[9]

14. Similarly, in paragraph 11, Bell states that:

> the Commission has recently determined that Bell Canada's traffic shaping practices do not violate sections 27(2) or 36 of the *Act*.[10]

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[8] Note 2 above.
[9] Comments of Bell Aliant Regional Communications, Limited Partnership and Bell Canada (23 February 2009), para 5 [Bell].
[10] *Ibid*. at para. 11.

15. With respect, these positions overstate the reach of the Commission's decision. First, the Commission is very careful to base its conclusions on "the evidence on the record" before it.[11] Had the Commission had different, further or other evidence before it, it may well have reached a different conclusion in *CAIP* v. *Bell*. Parties to the present Public Notice, including the CDM, have submitted substantial evidence to the Commission that was not available to it in *CAIP* v. *Bell*. The CDM submits that on the basis of this evidence, it is open to the Commission to reach a different conclusion than it reached in *CAIP* v. *Bell*. The CDM further submits that this evidence suggests that some ISPs' practices of arbitrarily throttling internet users using a particular application, and doing so in the absence of congestion on the network, justifies Commission intervention.

16. Second, the matter before the Commission in *CAIP* v. *Bell* related to Bell's wholesale services, not its retail business. The scope of the present Public Notice is broader than that of *CAIP* v. *Bell*.[12] It is open to the Commission to reach different conclusions in this Public Notice given the broad scope of the Commission's inquiry and the evidence available to it.

17. Third, the Commission itself recognized the importance of a comprehensive inquiry into internet traffic management practices, and, within the text of its decision in CAIP v. Bell, called for this Public Notice.[13] Indeed, this proceeding would hardly be necessary if Decision 2008-108 were determinative of the broader issue of throttling. Clearly, a primary purpose of this proceeding is to give parties an opportunity to present new and different evidence, so as to permit the Commission to come to a different conclusion as it did in Decision 2008-108. CDM submits that such evidence has been presented in this proceeding and that the Commission's findings in the *CAIP v. Bell* proceeding are thus in no way determinative of the issues in this proceeding.

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[11] *CAIP* v. *Bell*, note 2 above at paras. 33, 43, 45,46, 54, 66, 67 and 79.
[12] Public Notice, *supra* note 1 at para. 7: "In this proceeding, the Commission will explore the current and potential Internet traffic management practices of all ISPs operating in Canada, examining both retail and wholesale services."
[13] *CAIP* v. *Bell*, note 2 above at para. 80.

18. *CAIP* v. *Bell* offers ISPs no immunity to regulation. *CAIP* v. *Bell* sanctions no particular traffic management practices. Simply, it is open to the Commission in this proceeding to establish rules that compel Canadian ISPs to safeguard the internet's historically intrinsic neutrality. CDM urges the Commission to do so.

c) Cabinet Policy Directive & s. 7 Policy Objectives

19. At numerous points, parties to this proceeding have called upon the Commission to permit market forces to protect consumers.[14] Regulators facing public policy choices in 2009 must be cognizant of the risks associated with blind and dogmatic reliance on "market forces". Reliance on market forces offers one means of achieving public policy objectives; however, those objectives are most likely to be achieved when a healthy and competitive market is coupled with a realistic appreciation of the market's limitations and the role of the regulator.

20. Limitations of the Canadian marketplace for ISP services include the absence of vibrant competition. Many Canadian markets enjoy only a single service provider, or at best enjoy a choice among a duopoly. The CRTC's decision in CAIP v. Bell effectively foreclosed DSL resellers from distinguishing their services from those of Bell, further foreclosing the potential for enhanced competition in broadband.

21. Further, ISP service providers often offer services other than broadband, such as content delivery. It is naïve to consider that the business imperatives of these services can have no effect on traffic management decisions.

22. Accordingly, at times regulatory action may be required to preserve the benefits of a competitive marketplace in broadband services for consumers. Failure to regulate can, at times, actually undermine the functionality of the marketplace.

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[14] See, *e.g.*, Comment of TELUS (23 February 2009) at para. 3.

23. Consider the question of transparency: Bell's own evidence discloses that many of its customers are unaware of the fact that they are being throttled.[15] This suggests that a mandate for more forthright and transparent disclosure of ISP traffic management practices is in order.

24. In its Comment, the CDM pointed to a number of important public policy considerations that should guide the Commission in its assessment of Canadian ISPs' traffic management practices.[16] These include a commitment to privacy, the maintenance of incentives to innovate, and responding to the social and economic requirements of Canadians, and are grounded in s. 7 of the *Telecommunications Act*. The Policy Directive did not repeal these Policy Objectives. Indeed, s. 7 remains law in Canada. In effect, the Policy Objectives must be read alongside the Policy Directive and be given equal weight to the Directive. The Directive mandates reliance on market forces to the greatest extent possible; the Policy Objectives pose a limit to that extent.

25. The framework proposed in CDM's Comment envisions a central role for market forces in shaping appropriate ISP traffic management practices. The framework proposed in CDM's comment is deferent to legitimate ISP objectives. In this way, the CDM's proposed framework is very much in line with the Policy Directive: the framework proposed by CDM calls for the CRTC to regulate only so as to ensure companies act in a manner that is minimally intrusive of the values embodied in ss. 27(2), 36 and 7 of the *Telecommunications Act*.

Part II Internet Traffic Management: Considerations and Alternatives

26. As stated in CDM's initial submissions, application or protocol specific traffic management techniques violate the values embodies in the Act. They are discriminatory, they are inconsistent with the common carrier role of an ISP as protected by s.36, and

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[15] Harris-Decima, Internet Traffic Management Report, (February 3rd, 2009), p. 15 ("Just more than one third (35%) claim to be aware that this practice was being used.") in Bell, *supra* note 9.
[16] Campaign for Democratic Media, Comment (23 February, 2008) at paras. 209-236.

they run counter to the policy objectives of the Act. ISPs have asked for a free regulatory hand so as to develop their own distinct traffic management 'philosophies'.[17] The CDM submits that there is little room in these 'philosophies' for the values embodied in the Act, and that current chosen ISP practices demonstrate this and demand a regulatory response to ensure these values are respected at least as far as is reasonable possible.

27. In its comments of February 23, 2009 to this Commission, the CDM suggested an analytical framework by which any discriminatory traffic management practices used by ISPs must be justified if they were not to amount to unjust discrimination and be prohibited by s. 27(2) of the Act.[18] In its comments of the same day to the Commission, the Consumer Groups suggested a similar framework for justifying activities that violate the common carrier role established for ISPs under s. 36 if such activities are to gain the requisite approval of the CRTC.[19] In addition, the CDM has suggested that this same justification framework can be applied to assessing whether a telecommunications practice that detracts from the policy objectives of the Act should be permitted.[20]

28. In their comments to the Commission, a number of ISPs have made various claims in justifying their practice of interfering with traffic on their networks on an application-specific basis. Common to all these claims is the assertion that application-based throttling is the only viable means of addressing congestion issues on ISP networks. In this section of its reply, CDM will establish that these factual assertions are inaccurate and ultimately fail to justify such ISP practices.

29. Ultimately, this section concludes that there are viable alternatives available to ISPs that will be at least as effective at reducing congestion on their networks with minimal impact on the values embodied in ss. 27(2), 36 and 7 of the Act. However it is clear from the fact of this proceeding that many ISPs will not adopt such measures on their own. They

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[17] Bell, *Comments to Telecom PN 2008-19*, February 23, 2009, at para. 132.
[18] CDM, *Comments to Telecom PN 2008-19*, February 23, 2009, at para. 162 and following.
[19] Consumers' Association of Canada ["Consumer Groups"], *Comments to Telecom PN 2008-19*, February 23, 2009, at para. 244.
[20] CDM, *Comments to Telecom PN 2008-19*, February 23, 2009, at para. 170.

have no reason to, as they are simply not sensitive to these types of values and have no incentive to pursue strategies that will further them. CDM submits that this clearly demonstrates a need for the Commission to articulate a set of guidelines to ensure that ISPs undertake future network development in a manner that is consistent with these values.

30. In their various submissions to this proceeding, a number of ISPs have attempted to justify their application or protocol specific traffic management practices. Perhaps not surprisingly, the evidentiary record provided by ISPs in this proceeding can be neatly categorized around a number of findings of fact made in this Commission's decision in *CAIP v. Bell*.[21] The Commission premised these findings, however, on the evidentiary record before it in that proceeding. CDM submits that in context of the current public notice, evidence submitted by the various ISPs fails to establish these factual findings, and therefore to justify their current application-based practices. First, ISPs claim they have the responsibility of "ensuring that its network is operated effectively and efficiently", and that this responsibility justifies using traffic management practices that are antithetical to the values protected by the Act.[22]

31. The CDM acknowledges that ISPs are justified in establishing intrusive traffic management practices in response to congestion, but only if such congestion is demonstrably of a level that can *not* be met through reasonable provisioning alone. Even when meeting this bar, however, ISPs must still demonstrate that the methods they have chose are proportional in relation to the values protected by the Act. ISPs claim this to be the case, an provide evidence in their submission putatively establishing that, first, certain types of applications or protocols raise unique problems that cannot be met through

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[21] *CAIP v. Bell*, Telecom Decision 2008-108, November 20, 2008.

[22] *Ibid*. at para. 29. In *CAIP v. Bell*, the Commission held that ISPs had this responsibility to effectively manage their networks, and found that Bell had established that there was congestion on its networks that justified such traffic management practices. In this current proceeding, a number of ISPs have claimed that their default response to congestion is provisioning, and have justified deviations from that norm only as a response to types of congestion that cannot be met with reasonable levels of provisioning alone. These claims are examined in more detail below.

reasonable provisioning alone.[23] As such targeting applications of this nature is hardly an arbitrary response to the problem of unmanageable congestion. Second, various parties to this proceeding have in their comments challenged whether traffic management alternatives that are less intrusive with respect to the values embodied in the Act can be as effective as application or protocol based throttling.[24] Finally ISPs have claimed in this public notice that the salutary benefits of their respective methods of traffic management outweigh any detrimental impact to the values embodied in the Act.[25]

32. The CDM submits that the factual record in this proceeding has failed to establish any of these points and as such ISPs have not justified any application or protocol based throttling. In demonstrating this, it is useful to follow the framework set out above. As such, the remainder of this section is structured around the following headings:
    a. Have ISPs established that congestion justifies problematic traffic management?
    b. Is application-based throttling an appropriate response to this problem?
        i. Is it arbitrary?
        ii. Are there feasible alternatives that are less intrusive with respect to the values embodied in the Act?
        iii. Do the costs it entails in relation to the values embodied under the Act outweigh the benefits it confers?

33. As the following analysis will demonstrate, the ISPs in this proceeding have failed to justify their current intrusive traffic management methods. As such, the CDM submits that the Commission must take steps to ensure that intrusive traffic management techniques only be carried out in response to demonstrated unmanageable congestion and

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[23] See for example CAIP v. Bell at para. 30, and various ISPs cited below.

[24] For example, see Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at paras. 13. See also Rogers, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 18 questioning the efficacy of alternative solutions such as the Comcast proposal and at para. Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009. It should be noted that in *CAIP v. Bell*, the Commission premised its decision partially upon finding that there were no other practical solutions on the record (at para. 43).

[25] Many claim that their activities have *no* detrimental impact at all: see Shaw, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, generally.

that even under such circumstances, that they be implemented in the most minimally intrusive manner possible.

a) Have ISPs demonstrated that congestion justifies intrusive traffic management?

34. In *CAIP v. Bell*, the Commission acknowledged that Bell has a responsibility to address traffic congestion on its networks. A number of ISPs have made similar claims in their submissions to this public notice. Bell, for example, states that relieving congestion is "a responsibility shared by all ISPs."[26] Rogers claims a broader responsibility, which encompasses ensuring "network integrity, performance, redundancy, bandwidth optimization, safety and spam prevention."[27] Shaw similarly characterizes its obligation as one of providing for the quick and efficient transmission of data, which amounts to a balance between "providing the best quality of service and providing a service that is affordable to its customers".[28] TELUS, in its comments, also speaks of the necessity of allowing ISPs to develop their own reasonable network management practices in order to respond to changing technologies.[29]

35. The CDM acknowledges that ISPs have a responsibility to ensure their consumers are provided with efficient networks, and as such the purpose of alleviating congestion on a network is a legitimate reason to instigate measures that conflict with the values enshrined in ss. 27(2), 36 and 7 of the Act. The CDM has also acknowledged that, based on ISP submissions in this Proceeding, there may currently be congestion on ISP networks capable of justifying such responses.[30] However, the CDM has warned in its initial submission, that before the Commission can allow ISPs to rely on congestion-management as justifying intrusive measures, the Commission must establish a sound and standard measurement of network congestion.[31]

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[26] Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at ES7.
[27] Rogers, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 3.
[28] Shaw, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 16.
[29] TELUS, *Comments to Telecom Public Notice 2008-19*, February 23, 2009 at para 32.
[30] CDM *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 176.
[31] *Ibid*. at para. 179.

36. Additionally, as stated in the testimony of Bill St. Arnaud, the CDM notes that it is largely within the capacity of ISPs to create their own congestion by underprovisioning their networks.[32] In his testimony, Mr. St. Arnaud discusses the concept of oversubscription ratios to describe the practice by which ISPs sell a large amount of bandwidth to their consumers, but then refuse to provision their networks to a level capable of effectively handling the traffic produced by these consumers. The result is congestion. ISPs do so in large part because they wish to rely on other, more cost-effective techniques as a substitute for more expensive provisioning. In addition, this practice of overselling bandwidth allows ISPs to advertise ever-increasing services (Bell, for example, has raised the speeds on its modems from 1.1 Mbps in 2003 to 7 Mbps in 2007 – a 600% increase) without investing accordingly in their networks.[33] The CDM cautions that relying on criteria such as congestion alone to justify intrusive traffic management techniques is problematic, precisely because ISPs can allow congestion to develop on their networks by refusing to provision properly.

37. The CDM further points to the testimony of Professor Odlyzko, who notes that ISPs tend to overstate their ability to keep up with rates of traffic growth through provisioning alone.[34] This is reflected in comments made by ISPs in this proceeding.[35] Professor Odlyzko points out that such claims are unjustified, that technological developments have greatly decreased the cost of provisioning equipment, and that the evidence suggests ISPs are capable of meeting current rates of traffic growth with modest rates of investment.[36] This is strongly supported by the submissions of the Open Internet Coalition (OIC) in this proceeding.[37] In the U.S., cable ISP Comcast has stated that it could double the internet capacity in a given urban neighbourhood for an average investment price of $6.85 per

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[32] CDM, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, Testimony of Bill St. Arnaud [St. Arnaud], Attachment C, generally.
[33] Vaxination Informatique, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 57-58.
[34] CDM, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at paras. 96-98, 177. See also, i*bid.*, Testimony of Andrew Odlyzko [Odlyzko], Attachment A, at paras. 6, 14.
[35] See for example Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 57.
[36] *Odlyzko*, at para. 6.
[37] Open Internet Coalition [OIC], *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 21.

household – a fraction of current subscription rates.[38] Yet there is a strong incentive for ISPs to avoid making even these mild investments in order to meet growing congestion and to rely instead on intrusive alternative techniques. In fact, some have pointed out that the greatest benefit of DPI-based throttling is its ability to "save millions of dollars in capital expansion costs that would be necessary in order to meet growing bandwidth demands".[39] This is in spite of the fact that, as the OIC states in its comments, provisioning is by far the most efficient and effective response to congestion, and any reliance on alternative techniques would "harm Canada's competitiveness overall and would be contrary to the [policy objectives of the Act]."[40]

38. CDM submits that ISPs must do more than assert a broad claim of 'ensuring network performance' before engaging in traffic management practices other than provisioning as a response to congestion. ISPs must also establish that such congestion is of a level or type that cannot be met through reasonable levels of provisioning alone. Without such a requirement, there will be strong incentives for ISPs to continue creating their own congestion in order to raise oversubscription ratios at the cost of promoting innovation, of ensuring Canadian competitiveness, and of ensuring all Canadians have access to a well-provisioned network.[41] CDM further submits that ISPs have failed to establish that trends in traffic growth are at such a level that cannot be met with reasonable provisioning.[42]

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[38] S. Hansell, *As Costs Fall, Companies Push to Raise Internet Price*, The New York Times, April 20, 2009, available online at: <http://www.nytimes.com/2009/04/20/business/20isp.html>. Indeed, Congress has ordered the Federal Communications Commission to investigate the speed, availability and affordability of internet services in the U.S. Many ISPs fear this investigation will ultimately lead to price regulation of internet services.

[39] Arbor, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, response to PN question 2(d). Arbor claims such savings are justified because per-user bandwidth consumption is increasing and thus ISPs are forced to upgrade on their networks just to maintain current customer bases. As Professor Odlyzko has noted, however, this requirement of reasonable levels of continued expenditure is no different than those in any other industry where product developers must continually improve their product in order to maintain their existing consumer bases (see Odlyzko at para. 1).

[40] OIC, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 18.

[41] *Ibid.*, at para. 17.

[42] As stated *infra* at paras. 11-12 and elaborated further at CDM, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at paras. 93-98.

b) Is application-based throttling an appropriate response to this problem?

39. Even were ISPs to establish that there exists on their networks congestion of a nature that can not be met with through reasonable provisioning, CDM submits that ISPs have failed to demonstrate that application or protocol specific throttling is a proportional response to such congestion. It is an arbitrary response, it is not the most minimally intrusive response, and the detrimental impact of such throttling far outweighs any salutary benefits it may have.

i) Arbitrary?

40. In this proceeding, a number of ISPs attempt to justify their application or protocol specific throttling by stating that certain applications or protocols operate in a manner that is impossible to meet with provisioning alone. CDM has already provided a partial answer to these claims in its initial comments.[43] Additional evidence and new claims made by various parties to this proceeding warrant a closer examination of this issue. CDM concludes that while, as ISPs claim, some types of P2P file-sharing traffic pose somewhat unique problems for some types of networks, ultimately throttling such applications remains nothing more than an attempt by ISPs to avoid reasonable provisioning costs. As such application or protocol specific throttling is not a rational response to the purpose of addressing congestion that cannot be met through reasonable provisioning alone.

41. ISPs offer the following justifications for their throttling of P2P file-sharing applications. Such applications are designed so as to overwhelm all other traffic by 'eating up' all available bandwidth.[44] P2P applications can generate a constant stream of traffic, 24 hours a day, 7 days a week.[45] P2P applications target the fastest available nodes or links on a network, and as such increasing capacity at a congested node will merely attract

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[43] CDM, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at paras. 100-109.
[44] Rogers(CRTC)4Dec08-8, at p. 2/4.
[45] Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 35.

ever-increasing traffic from the world's downloaders.[46] And P2P file-sharing applications are not 'time-sensitive', so their traffic can be delayed without any impact on the user.[47]

42. There is some merit to some of these claims. However the effects attributed to these features of P2P file-sharing applications appear to be greatly exaggerated. Each of these will be discussed below, but the conclusion here is that such applications do *not*, as Rogers chief Strategy Officer stated, create problems that "[y]ou can't spend your way out of".[48] Congestion caused by P2P file-sharing applications, just as congestion cause by any other type of application, can be addressed through provisioning alone. It is not the nature of P2P traffic that raises any type of issue for reasonable provisioning, it is only the amount of traffic generated by such applications, and the evidence is that such applications do *not* generate excessive amounts of traffic. Moreover, P2P file-sharing applications do not generate an 'unfair' amount of traffic.[49]

(1) P2P file-sharing applications do not generate disproportionate, unfair or unmanageable amounts of traffic

43. Evidence submitted in this proceeding demonstrates that P2P file-sharing applications do *not* generate either a disproportionate amount of traffic nor an amount that cannot be met through provisioning. First, in North America, P2P traffic comprises no more than 20% of downstream or 30% of global traffic *at peak times*.[50] Assuming for the moment a

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[46] *Ibid.*
[47] *Ibid.* at para. 32.
[48] Peter Nowak, "*Rogers says its internet interference is necessary, but minimal*" 10 June 2008, CBC News, online: <http://www.cbc.ca/technology/story/2008/06/10/techrogers.html>.
[49] As claimed by some ISPs. See for example Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 34.
[50] Sandvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, Appendix A: states that P2P downstream traffic is about 17% of all peak period traffic (p. 15). This means the average consumer produces 5,600 bps of P2P downstream traffic (see p. 14: 20% * 28,000 bps = 5,600) plus an additional 5,400 of P2P downstream traffic (*ibid*., 60% * 9,000 bps = 5,400 bps) for a total of 11,000 bps of P2P traffic out of a total 37,000 bps (28,000 + 9,000). This means P2P traffic comprises about 30% of all traffic (11,000 / 37, 000 = 30%). While it is difficult to say what the precise proportion of P2P traffic in Canada is, as disclosed numbers are anonymous, 30% is certainly within the range presented in this proceeding (see CRTC, *Letter to Interested Parties*, Telecom Public Notice 2008-19, February 11, 2009, as amended by subsequent letter of February 12, 2009).

conservative estimate that 15% of all users on a given network are P2P users,[51] 20% downstream traffic is hardly an extravagantly disproportional amount, especially given the fact that such applications are generally used to transfer larger files than some other types of traffic. Further, this leaves 80% of download capacity for other applications. That can hardly be characterized as 'overwhelming' other types of traffic. On a macro scale, then, it is difficult to say that P2P file-sharing applications currently generate an overwhelming or a disproportional amount of net traffic.

44. Does P2P allow a small number of users to generate an 'unfair' amount of traffic? It is true that a small number of users (about 5%) produce a large amount of traffic (about 50%), and a large portion of this traffic is P2P traffic (about 55%).[52] However, 'fairness' is not a straightforward concept in network management.[53] A P2P user that generates 25% of all traffic on a network within a given month this would not be considered 'unfair' if it did not detrimentally impact on other concurrent users. Indeed, this would be considered an efficient use of bandwidth that would otherwise be left unutilized. As such, P2P use should only be classified as 'unfair' to the extent that it truly overwhelms other traffic. Macro traffic numbers demonstrate that this is not the case, but can a single disproportionate user generate enough traffic so as to overwhelm other users sharing a specific network node with that user?

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[51] A recent study commissioned by Bell (Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, attachment A, at p. 25) and included in its comments to this proceeding estimates that 12% of internet users are users of P2P file-sharing applications. However this number is questionable. It is derived from two survey questions. The first question asks users whether they "typically use the internet" to either "download or stream music, movies or videos on a regular basis" OR mostly just "for email and surfing websites" (p. 25). The second question then proceeds to ask those that stated they typically download or stream music, movies or videos (26% of all users) if they *primarily* use P2P and other file-sharing-applications (13%) or whether they typically stream video (%13). The dichotomy created by the first question, however, is false. A large number of P2P users may also, or even mostly, use the internet for email and websurfing. In fact most internet users are likely to use their internet services mostly for websurfing and email and only secondarily for downloading or streaming files. Setting up a dichotomy of this nature runs the risk of grossly underestimating the number of actual users of P2P and other file-sharing programs.

[52] CRTC, *Letter to Interested Parties*, Telecom Public Notice 2008-19, February 11, 2009, as amended by CRTC, *Letter to Interested Parties*, Telecom Public Notice 2008-19, February 12, 2009, answers to questions 2(b) and (c).

[53] CDM, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, Testimony of Dr. Reed, Attachment B, at paras. 46-48.

45. Again, if one examines the evidence, this does not appear to be the case. Comcast, a major U.S. cableco that has historically complained of problems with 'unmanageable' levels of traffic, has installed equipment in its networks that allows for fine-grain measurements of congestion over short periods of time. Comcast operates in North America, and should have comparable levels of P2P traffic/users on its networks as most Canadian ISPs. According to these measurements, while congestion does occur on a given network, it is so infrequent that the cause of this congestion can be traced back to far less than 1% of users on that network.[54] Moreover, to ensure a congestion-free network, these few users rarely need to be throttled for more than 15 minutes at a time.[55] If the actual amount of disruptive or 'overwhelming' traffic at any given node is so small, this suggests there is not very much 'unfair' activity actually occurring on networks, regardless of whether this is generated by P2P file-sharing applications or not. But what then of ISP arguments that such applications are unmanageable and unfair? These arguments will be addressed next.

(2) The nature of P2P file-sharing applications: ISP claims

46. ISPs make the following charge against the P2P protocol:

> *P2P clients generate "swarms" of TCP sessions. A single user transferring a single file will set up many simultaneous TCP sessions, where a traditional file transfer protocol uses a single session. Certain network devices will allocate bandwidth based on the number of sessions in progress, resulting in P2P users getting a disproportionate amount of network resources at the expense of other customers.*[56]

This is what purportedly gives P2P applications the potential to 'overwhelm' other types of traffic and to eat up all available bandwidth.[57] It is true that P2P opens multiple

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[54] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 15, Comcast Frequently Asked Questions about Network Management posted on Comcast.net Network

Management Policy, available online at: <http://www.comcast.net/terms/network/>.

[55] Sandvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 95, Comcast Corporation, *Description Of Planned Network Management Practices To Be Deployed Following The Termination Of Current Practices*, Sep. 2008, available at http://fjallfoss.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6520169715.

[56] Rogers(CRTC)4Dec08-8, at p. 2/4.

[57] Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 34. See also *CAIP v. Bell*, at para. 30: P2P file-sharing applications are designed to "make the maximum use of downstream and upstream bandwidth and to use up additional capacity in the network as it becomes available."

connections and that TCP allocates bandwidth based on the number of open TCP connections. Yet the numbers stated above demonstrate that P2P does *not* lead to large scale disproportional and overwhelming allocations of traffic. Indeed, ISPs themselves indirectly prove that this is the case. Joost, a video-streaming application that allows for file-transfers as large as those used by file-sharing applications, also utilizes the P2P protocol to achieve these transfers. However most ISPs do *not* throttle Joost, and it does *not* lead to overwhelming traffic.[58] Similarly, Bell does not throttle *any* applications during off-peak periods, yet nonetheless these applications do not overwhelm all other available traffic during these times.[59] This suggests strongly that it is not the nature of P2P file-sharing applications that makes them impossible to reasonably provision for, but rather the degree of use to which these applications are put.

47. Indeed, there are a number of factors that limit the ability of P2P applications to 'overwhelm' other traffic. First, a P2P user may add multiple connections to a given link. This will change the proportion of traffic allocated to each pre-existing connection at that link, but it will never eliminate these other links altogether. It is worth noting that other types of traffic employ multiple links as well. For example, downloading a commercial web page 4 TCP connections are used. Second, each P2P connection is further limited in the amount of bandwidth it can take away from other connections at that link, in that P2P application connections can only be as large as the corresponding upstream link to which they are connecting. All existing ISPs allocate a much smaller amount of bandwidth to upstream rather than downstream traffic.[60] Meanwhile, other types of traffic often rely on downloads from servers, which generally have much greater upstream allowances and are therefore able to maintain much larger downstream links.[61] Our P2P user, then, is unlikely to utilize more than 50% of the actual maximum potential of its total TCP connections. Finally, the TCP protocol has within it a mechanism that imposes a larger

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[58] Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. ES10.
[59] The Companies(CRTC)4Dec08-8 PN 2008-19, ABRIDGED, at p. 3 of 23.
[60] Bell, for example, sells its consumers only 1 Mbps of upstream bandwidth in its highest internet package, which offers 16 Mbps of downstream traffic. A more typical ratio of up to down service may be 1:10. See <http://www.bell.ca/shopping/PrsShpInt_NewAccess.page?userType=NEW>, 'Bell Internet Max 16'.
[61] St. Arnaud at para. 39.

and larger slowdown on a given traffic source the more connections it produces on a given link.[62]

48. While it is possible for a P2P application to generate traffic in a manner that would lead to an unfair distribution at a given link, *if that link is congested*, in a well-provisioned network, due to these limiting factors, the detrimental impact of P2P will be minor, as non-P2P applications TCP connections will still be able to get the bandwidth they require. As pointed out above, there is little evidence that this type of overwhelming activity is occurring on a scale that cannot be met through reasonable provisioning.

49. ISPs additionally claim that:

> *Because of the possibility of queuing file requests, P2P file-sharing can sustain a continuous maximum network traffic load, 24 hours a day, 7 days a week and 365 days a year, as long as there are queued requests;*[63]

As mentioned above, the amount of traffic generated by an application over a period as long as a week or a month is irrelevant. It is only the amount of traffic generated that impacts detrimentally on other applications. Internet traffic is 'bursty'.[64] This means that for *any* given application, including a P2P application, link utilization can be 100%, but generally this will only be for very brief periods of time (fractions of a second). Professor Odlyzko has demonstrated that on some networks, for example, link utilization over periods as brief as 30 minutes is rarely higher than 8.7%.[65] This allows competing sources of traffic to alternate traffic 'bursts' down their own links in a manner that utilizes a much higher percentage of shared aggregation equipment such as a DSLAM.[66] It is only conflict between bursts that causes congestion, and, as ISPs repeatedly state, networks are provisioned for peak periods when such conflicts are most likely to occur.[67]

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[62] TCP Slow Start operates in this way, further limiting the amount of traffic multiple TCP sessions can use to 'overwhelm' other traffic.
[63] Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 24.
[64] Reed at para. 47.
[65] A. Odlyzko, *Data Networks are Lightly Utilized, and Will Stay That Way*, AT&T Research Labs, October 7, 1998, available online at: <http://www.dtc.umn.edu/~odlyzko/doc/network.utilization.pdf>, at p. 6.
[66] *Ibid.*
[67] Bell *Comments to Telecom Public Notice 2008-19*, February 23, 2009. It is for this reason that ISPs justify 'shifting' P2P traffic to off-peak hours.

Thus off-peak traffic generated is hardly relevant. Moreover, as discussed above the actual amount of 'conflict' caused by P2P file-sharing applications appears small, as such applications comprise only 30% of net traffic.

50. ISPs also argue the following:

> *Some P2P file-sharing applications look for the fastest node available, and thus any increase in capacity to one network node will attract increased P2P file-sharing upload requests from other P2P file-sharing applications resident on other networks. As described by Rogers' Chief Strategist at the latest Telecom Summit, Rogers' tests have indicated that an increase of capacity at a node could be eaten up by P2P file-sharing applications within 24 hours. Indeed, the Company's own testing shows that in some cases the increase in capacity could be eaten up in as little as 30 minutes.*[68]

As stated in its initial comments to this proceeding, CDM submits that this is misleading.[69] In addition, it should be noted that this argument only applies to *upstream* capacity, not *downstream*. Increasing downstream capacity at any given node will *not* attract more uploaders. Increasing capacity in the upstream direction might attract some more, but there is an uppers limit on how much traffic this will attract. A large enough investment in upstream traffic is certain to provide sufficient capacity for P2P applications as well as any other upstream traffic traveling through that link.

51. Upstream traffic, however, poses a real problem for current ISPs, and especially for cablecos.[70] This is because current ISP networks are not provisioned symmetrically.[71] It is this asymmetry that accounts for the high proportion of upstream traffic (60%) generated by P2P applications.[72] It is not because such applications are 'overwhelming' other types of traffic, but rather because few other types of applications produce large amounts of upstream traffic.[73] However, this is a fault of ISPs and not of the P2P protocol and, most notably, this is a problem of provisioning that can be met through increasing capacity. Nonetheless, data from the Comcast network, a cableco with the

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[68] Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009,, at para. 24.
[69] CDM, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at paras. 100-108.
[70] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, generally.
[71] In North America, the ratio of download to upload traffic at peak periods is about 3.18:1 (Sandvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, Appendix A, at p. 6).
[72] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 10.
[73] *Ibid.*

same asymmetry problems, demonstrates, as noted above, that actual congestion in the upstream direction is also minimal.

52. There are two factors that limit this. First, the detrimental impact of P2P traffic is *greater* on other applications used by P2P consumers, in that this traffic must first compete with that consumer's email or web browsing *before* it competes with other traffic at an aggregation point. As such there is a strong incentive for P2P users to manage their *own* traffic. In this respect, P2P applications provide users the capacity to limit their upload and download capacity, and the incentive is for users to prioritize their own traffic accordingly. Second, as stated above, many P2P applications target the least congested and 'fastest' nodes or links. As such the impact of P2P traffic is further ameliorated, as these applications do not add to already congested links in either the up or down direction.

53. Finally, ISPs justify throttling P2P file-sharing applications because they are not 'time-sensitive'. However, aside from actual 'real time' or high-latency sensitive applications, 'time-sensitive' is highly subjective and largely in the eye of the user. For example, Bell labels Joost as 'time-sensitive' and a BitTorrent as 'non-time-sensitive', because the former involves progressive video download and the latter a normal download. However, in many cases, both applications may be used to view the same exact file. A user may wish to see X show in an hour, and may employ either Joost or BitTorrent to download that show. In either case the expectation is the same. For this reason, ISPs cannot and should not be guessing which applications are more 'time-sensitive' than others. Regardless, given that there is little actual proof of unfair or overwhelming traffic produced by P2P applications, and even less evidence that such throttling addresses a problem that cannot be managed through reasonable provisioning alone, there is no rational purpose to allow ISPs to degrade such traffic, regardless of its theoretical potential for problems.[74]

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[74] Odlyzko at para. 25 makes the point that, just as banks could not operate based on the assumption that every single person might take their money out on the same day, ISPs should not be basing their traffic management practices on the possibility that P2P file-sharing applications *might* one day overwhelm all other traffic.

ii) Are there feasible alternatives that are less intrusive with respect to the values embodied in the Act?

54. CDM strongly cautions against allowing any type of measures that detract from the values in the Act as a substitute for provisioning. The evidence suggests that such measures are not necessary for meeting congestion and that ISPs should not be permitted to rely on such measures as an excuse to sell more and more bandwidth to consumers and provision less and less in return. Nonetheless, the CDM acknowledges that if there were traffic congestion that could not be met through provisioning alone, some intrusive traffic management techniques may be justified. ISPs should be permitted to achieve their objective of managing their networks effectively, but should do so in a manner that is minimally intrusive with respect to the values in the Act if they are to be consistent with it. This does not involve a free hand to "implement any reasonable traffic/network management practices tailored to its own network operational context."[75] In order to be minimally intrusive, traffic management solutions should not be overbroad in achieving their purpose, as a number of current ISP practices are.

55. In their comments to the Commission, some ISPs have also questioned the feasibility or desirability of alternatives such as pricing mechanisms, IETF approved techniques, and the Comcast proposal to application or protocol based throttling.[76] Generally, however, ISPs have defended their chosen methods as sufficiently tailored alternatives to their existing problems. Instead, most ISPs have merely called for a proliferation of management philosophies. Evidence submitted in this proceeding has demonstrated, however, that each of these alternatives is less intrusive than application-based throttling and thus, to the extent that each is effective, should be relied upon before any more intrusive measures are adopted. This section will establish that application or protocol specific traffic management techniques are overbroad in themselves, and that moreover less intrusive and workable measures that are not overbroad are available.

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[75] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 19.
[76] Rogers, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 18

(3) Overbroad

56. An overbroad measure has been defined by the courts as one that detrimentally impacts on more activity than is necessary to achieve its stated purpose.[77] Although ISPs claim that their respective application-specific throttling practices are the "best practical option to deal with congestion created by these applications",[78] currently implemented measures are in fact overbroad in a number of ways. First, it is not effectively tailored to reducing actual congestion. Second, the method by which many ISPs currently implement their application specific throttling is overbroad in that it appears to capture far more traffic than it intends to and it has serious and unnecessary external costs. Finally, by targeting specific applications as a class, this approach unnecessarily impacts on the majority of P2P users.

57. Current ISP practices do not sufficiently target actual congestion. Bell, for example, throttles all P2P file-sharing traffic during their self-defined 'peak period'.[79] Rogers,[80] Shaw,[81] and Cogeco[82] throttle upstream traffic for a number of applications at all times. Yet these ISPs claim that their traffic management practices are necessary for handling congestion on their networks.[83] However, congestion at any given link generally lasts no more than a few minutes at a time. Professor Odlyzko has found, for example, that while at any given instant, a network link or node may experience a high degree of utilization, when one looks at such utilization over time one finds that such links are surprisingly underutilized. In one study of a network, Professor Odlyzko found that average link utilization for periods as short as 30 minutes is not higher than 8.7%.[84] Data from Comcast, a major U.S. cable ISP, shows similar results. Comcast has established congestion alleviation measures that operate only as long as congestion exists at a given network point. It has found that such measures rarely need to be employed for more than

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[77] *R. v. Keegstra*, [1990] 3 S.C.R. 697 (S.C.C.).
[78] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 13.
[79] The Companies(CRTC)4Dec08-8 PN 2008-19, ABRIDGED, at p. 3 of 23.
[80] Rogers(CRTC)4Dec08-8, ABRIDGED, at p. 1 of 4.
[81] Shaw(CRTC)4December 2008-08, ABRIDGED, SUPPLEMENTAL.
[82] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 7.
[83] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 13.
[84] A. Odlyzko, *Data Networks are Lightly Utilized, and Will Stay That Way*, AT&T Research Labs, October 7, 1998, available online at: <http://www.dtc.umn.edu/~odlyzko/doc/network.utilization.pdf>, at p. 6.

15 minutes at a time in order to eliminate congestion at that point.[85] Perpetual throttling or throttling that continues for 10 hour peak periods is far in excess of what is necessary to alleviate congestion. As such it cannot be said that such practices are sufficiently tailored to congestion management.

58. Second, it is not at all clear how ISPs have managed to deal with the problem of encryption. ISPs utilize DPI equipment in their traffic management, putatively in order to 'open the envelope' that is generally used to transport information over the internet so that they can discern the type of application that generated the signal. In this way the ISP is able to decide which applications to throttle and which to allow to pass unimpeded. DPI equipment is incapable, however, of reading through encrypted signals.[86] In fact, much of P2P and other file-sharing traffic appears to be encrypted at this point and as such cannot be identified by 'opening the envelope'.[87] This reality makes application-specific throttling overbroad in two ways.

59. Some ISPs appear to respond to encrypted traffic by adopting a 'throttle everything' approach as a default response to encrypted signals.[88] They then proceed to exempt certain types of traffic identified based on the port that traffic targets.[89] This is extremely problematic for a number of reasons. First, as has been noted numerously in these proceedings, the port-based application identification system has to a large extent broken down.[90] This means that even types of encrypted traffic that the ISP attempts to exempt from this 'throttle everything' scheme, such as Virtual Private Networks (VPNs), File Transfer Protocol (FTP), will in many cases be degraded. Perhaps more importantly, other types of encrypted traffic, such as encrypted HTTP traffic, will inevitably be caught as it would be undistinguishable from the majority of encrypted P2P or other file-sharing

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[85] Sandvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 95.
[86] Rogers, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 17.
[87] *Ibid.*
[88] Bell, *Internet Traffic Management*, available online at: http://www.wholesale.bell.ca/internetman.asp>, 'Are there other applications that could be impacted by Bell's traffic management measures?' describes how its throttling will generally capture all encrypted signals unless they target an identified port.
[89] *Ibid*.
[90] Rogers, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 17.

traffic which generally uses the same port (80). This problem will only be exacerbated when, as some suggest is imminent, greater and greater proportions of HTTP (e-mail, online vendors, social networking sites, etc.) traffic will be offered with encryption.[91]

60. Other ISPs claim they use heuristics to identify specific applications, but have presented no evidence on how accurate such heuristics are.[92] As had been noted numerous times, without 'opening the envelope' in order to read the part of the payload that identifies the application in use (what some refer to as the 'application header'), it is very difficult to tell the type or application to which a certain stream of packets belongs.[93] At best, such methods can only offer a best 'guess' as to what the application in question is. There is no evidence on the record as to the efficacy of this method, but it appears highly likely to capture large amounts of non-targeted traffic, and is certainly overbroad if that is the case. As Dr. Reed states in his testimony, "[t]he basis by which DPI "understands" which flows are more important is unreliable, non-standard, and invasive, depending on guessing characteristics of application data, or violation of end user privacy."[94]

61. Alternatively, the very use of DPI processes to 'open the envelope' and track which user is using which application when is extremely problematic from an internet engineering perspective and violates the privacy of users. If, as some claim, this process is in fact not even necessary in order to identify problematic types of traffic,[95] then how is the use of such equipment justified in other instances?

62. Finally, by targeting all users of a given application, the methods currently employed by Canadian ISPs unnecessarily impact on those users of such applications that do not generate traffic capable of causing congestion. Evidence presented in this proceeding has

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[91] Soghoian, http://dpi.priv.gc.ca/index.php/essays/deep-packet-inspection-%E2%80%93-bring-it-on/.
[92] Rogers, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 17. Shaw (Shaw(CRTC)4December 2008-08, ABRIDGED, SUPPLEMENTAL) does not explain how they are able to distinguish P2P file-sharing applications from other types of P2P applications, but they do claim to only read the protocol header and not to examine the application header buried in the payload *and* to distinguish between P2P file-sharing applications and other P2P traffic. It is not clear how they accomplish this.
[93] The Companies(CRTC)4Dec08-8 PN 2008-19, ABRIDGED.
[94] Reed at para. 61.
[95] Rogers, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 17.

established that approximately 40-60% of all traffic is generated by a small proportion of users (5%) and that most of the traffic generated by these users is of the type targeted by ISPs.[96] However, as pointed out by Bill St. Arnaud, by targeting applications as a class, ISPs are impeding the ability of customers to use such applications even at levels that would not significantly contribute to congestion.[97] While the use of such applications is still limited to a minority of consumers as they are at this point emerging technologies, such applications are used by far more than 5% of customers.[98] Yet it is 5% alone that are responsible for the majority of congestion problems. Moreover, it seems as though actual congestion is caused by less than 1% of customers on a given network.[99] Degrading the service of customers that are not generating P2P or other file-sharing traffic at a rate capable of causing unmanageable congestion on an ISP's network is unnecessary, and as such an overbroad and disproportional response to any perceived problem attributed to certain types of traffic congestion.

63. The conclusion is that application-based throttling is a disproportional and overly broad response to any legitimate problem of congestion management. This fact is exacerbated by the reality that far less intrusive alternatives are currently available, and ISPs are capable of developing other similar solutions as well if given the proper incentives. The next section examines the available alternatives.

(4) Less Intrusive Alternatives

64. As mentioned in our initial comments to this proceeding, ISPs have a number of options available to them that are far less intrusive with respect to the values protected by the Act. The CDM maintains that any of the options enumerated here still detract from these values, and should still be justified if used as a substitute to provisioning, but they do so to a lesser extent than application-specific throttling and as such are far preferable. These options include pricing incentives, IETF approved traffic management techniques, and

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[96] CRTC, Letter of Feb 11, response to q.s 2(b), 2(c) and 2(d).
[97] St. Arnaud at para. 46.
[98] See Bell, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, attachment A, at p. 25, and *supra* note 35.
[99] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 15.

the solution proposed by Sandvine in its comments to this proceeding. Each of these will be explored below.

65. *Pricing Mechanisms* – Proper pricing mechanisms also provide a potential response to the problem of otherwise unmanageable congestion, although the CDM cautions against over reliance on such methods. Many ISPs have pointed out that pricing mechanisms are not in fact an effective response to the types of congestion that are the subject of these proceedings. ISPs state that because pricing mechanisms can only offer traffic-reducing incentives to customers over the course of a month these types of incentives are not fine-grained enough to alleviate congestion of the type that cannot be managed through provisioning alone. Pricing aimed at diminishing monthly usage is likely, for example, to impact more on off-peak traffic than it does on peak traffic. As ISPs must provision their networks so as to handle peak traffic, off-peak usage of their networks costs them nothing. Given this, pricing mechanisms may be less a traffic management mechanism and more an additional source of revenue for ISPs.[100] If this is the case, ISPs should be more transparent about their purposes for instituting such methods.

66. To the extent that pricing mechanisms are effective, they are preferable to application-based throttling. Such practices will be effective if they target the 5% of users that generate the most traffic and encourage them to reduce their traffic loads by targeting excess bandwidth usage. This will relieve the overall strain on a network and in doing so is likely to reduce congestion on some network links during peak times, some of the time. In doing so, these mechanisms avoid many of the discriminatory problems involved in application specific throttling. Pricing mechanisms that target specific applications or classes of traffic, however, are as problematic as application-specific throttling and not as effective. Any pricing mechanism that is relied upon by ISPs to target congestion that can otherwise be handled through reasonable provisioning alone is counter to the objectives of the Act and unjustified for the purpose of traffic management. Pricing mechanisms that do not target specific applications or types of traffic, however, are far

[100] Snadvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 66.

preferable to application-based throttling as a response to congestion that cannot be managed through provisioning alone. They impact to a much lesser degree on the values protected by the Act, and they allow consumers to decide for themselves if they wish to incur higher costs in order to make greater use of their services.

67. *IETF Solutions* – As noted in the testimony of Dr. David Reed, the IETF has been developing and studying a number of traffic management techniques that have to date been under utilized by ISPs.[101] These techniques allow ISPs to manage traffic in a manner consistent with the following principles:
    - without selectively or arbitrarily degrading traffic based on its source, destination, content type, application or protocol;
    - without examining the payload of the signal ('opening the envelope'); and
    - without deviating from proven and established norms of internet traffic management.[102]

    RED and ECN in particular are designed so as to detect actual congestion at a network link, and to slow down traffic flows to that link only as long as necessary to alleviate congestion at that given point. When used in conjunction with Diffserv, which allows Users to prioritize data flows that are time sensitive, these mechanisms create a workable method of addressing traffic that is far more effective manner than application-based throttling. RED and ECN will ensure that a link is not overly congested by easing traffic on that link as it reaches a threshold level of latency. Diffserv will allow customers to prioritize more time-sensitive applications so that they are not impacted upon by such congestion management.

68. Since RED and ECN do not target a class of applications, they avoid many of the overbreadth problems associated with application-based throttling. They only operate as long as there is actual congestion as a given link. They do not 'open the envelope'. Nor do they target users of an application who generate only small amounts of traffic. In addition, when combined with Diffserv, customers gain control over prioritization of

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[101] Reed at para. 59.
[102] Reed at para. 41.

their traffic and can decide for themselves whether to degrade one type of traffic in order to allow for another, perhaps more time-sensitive type.

69. Perhaps more to the point, by targeting congestion directly instead of a specific type of traffic and allowing customers to prioritize their own applications, the IETF solutions are able to achieve their objectives in a manner that is less discriminatory. Further, by not singling out certain applications or protocols, these methods do not impact detrimentally on the types of content that rely on those applications or protocols in a manner that influences the meaning and purpose of that traffic. Additionally, these methods do not diminish innovation by degrading the ability of newly emergent technologies to operate[103] nor do they weaken the social and economic fabric of Canada by diminishing the ability of independent Canadian artists to distribute their content.[104] By not 'opening the envelope', such techniques also avoid the privacy implications raised by application specific throttling. In this respect such techniques are much more sensitive to the values embodied in the Act.

70. To the extent that such mechanisms are relied upon by ISPs as an alternative to provisioning, they are still undesirable with respect to the policy objectives. As stated in the testimony of Bill St. Arnaud, ISPs advertise ever-increasing amounts of bandwidth to consumers. Diminishing the ability of consumers to make use of this bandwidth as they wish arbitrarily discriminates against those users who wish to use a higher proportion of the bandwidth they have purchased.[105] As such, these types of mechanisms should only be permitted as a response to demonstrable congestion of proportions that cannot be met through reasonable provisioning alone. The CDM maintains that this pressing need has yet to be proven. Nonetheless, in the presence of such congestion, the IETF approved methods are far less discriminatory, do not violate the common carrier role of ISPs as established in s. 36, and to the extent that they work contrary to the policy objectives they do so in a manner that is far less detrimental than application specific throttling.

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[103] As application-based are bound to do: St. Arnaud at paras. 23, 47.
[104] See, for example, Documentary Organization of Canada, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, generally.
[105] St. Arnaud, generally.

71. *Sandvine Solution* – In its comments to this proceeding, Sandvine has outlined a traffic management solution that has been proven to be effective in managing congestion and does so in a manner that impairs the values embodied in the Act to a much lesser degree than application-based throttling. The Sandvine approach, initially developed in response to regulatory action by the U.S. Federal Communications Commission, institutes the following 4 step process in order to reduce traffic:

Step 1: It constantly monitors traffic usage data for both upstream and downstream traffic to determine if traffic levels have reached a point where congestion is imminent in a network segment. If this threshold is reached for either upstream or downstream traffic in that segment, the Sandvine response proceeds to step 2.

Step 2: Within the affected network segment, it determines which subscribers have been the source of the high volumes of traffic. It then labels traffic emerging from those subscribers as lower priority.

Step 3: However, Sandvine's traffic management equipment does nothing to degrade this 'lower priority traffic' unless there is *actual* congestion detected in that particular network segment. If such congestion is detected, 'lower priority' traffic is degraded for a period of 15 minutes.

Step 4: Sandvine's equipment monitors each degraded subscriber's usage levels every 15 minutes, and once a given subscriber's usage level drops below a set threshold or once congestion in the network segment is no longer an issue, that subscriber's traffic is relabeled as 'normal priority' and will no longer be degraded.[106]

72. If this solution is combined with prioritization of traffic that is highly latency sensitive, the impact on consumers will be minimal.[107] Under such circumstances, even those consumers whose traffic is degraded will still be able to operate those applications that

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[106] Comcast, Submissions to FCC, File No. EB-08-IH-1518, WC Docket No. 07-52, September 19, 2008, available online at: <http://www.eff.org/files/Complete%20Comcast%20NM%20Filing%20--%20Date-Stamped%209%2019%202008.pdf>, Appendix B.

[107] Sandvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 55.

are latency sensitive as such traffic will not be assigned low priority status.[108] If combined with DiffServ prioritization, consumers will even be able to determine themselves how to allocate the limited bandwidth available to them during the period of de-prioritization.

73. As with many of the IETF proposals, the Sandvine solution avoids the overbreadth problems endemic in most current ISP traffic management practices. It only operates as long as there is actual congestion, and it targets those subscribers responsible for producing the most amount of traffic at the congested points. In this way it avoids capturing consumers who are not producing large amounts of traffic at times when no actual congestion exists. In fact, testing has shown that the Sandvine solution has shown that, not only is it effective in ensuring a given network will function without congestion, but that in order to achieve this throttling of any given user for more than a 15 minute period need occur only on very rare occasions.[109] Implemented in this fashion, the Sandvine solution is far better tailored to the actual problem of congestion than any form of application-based throttling.

74. Therefore, the Sandvine solution has the potential to be far more sensitive to the values embodied in the Act than current application-based ISP practices are. However, there are some dangers with adopting such an approach. CDM reiterates that such a solution is only viable insofar as it targets congestion that cannot be otherwise addressed through reasonable provisioning alone. Allowing ISPs to rely on congestion management techniques such as the Sandvine solution could lead to serious degradation in network services. As noted above, ISPs will be able to effectively create their own congestion by overselling bandwidth subscriptions, and then set their definition of 'congestion' at a

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[108] Prioritization should *only* apply to applications that are in fact latency sensitive. To date, these include VoIP, teleconferencing, and gaming (Odlyzko at para. 24). This does *not* include other traffic such as e-mail, web browsing, video streaming or instant messaging. None of this types of traffic require high latency to operate. The differences between these types of traffic and typical file-sharing applications with respect to 'real-time' are highly subjective and will differ from one consumer to the next. Allowing ISPs to decide which of these types of traffic to prioritize would raise many of the same problems as allowing ISPs to degrade traffic on an application-specific basis.

[109] Sandvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 95.

level that will allow them to provision less and less, while relying on throttling consumers to greater and greater degrees.

75. CDM also cautions against allowing ISPs to determine which types of traffic to prioritize. Given a free hand to do so, ISPs can effectively implement a solution that is no different from the current practice of application-based throttling. They will be able to achieve this by prioritizing all traffic other than the specific applications they wish to target. Sandvine itself identifies web traffic, instant messaging and video streaming (web media) as time-sensitive applications in need of prioritization.[110] Sandvine even suggests that some bulk file sharing applications such as iTunes should be prioritized. CDM submits that any difference in time sensitivity between such applications is purely subjective and will change from user to user.[111] A system that allows users to prioritize available bandwidth between their *own* applications would be ideal, as it is the only method of accurately allocating bandwidth to the applications that most need it when they most need it. Barring a system of user prioritization such as DiffServ, only traffic that is *truly* time-sensitive should receive prioritization. Only such latency sensitive traffic actually requires prioritization in order to function.[112] Latency sensitivity is an objective technical definition, not a subjective one defined by user or ISP preferences. Particularly with a typical throttling window of 15 minutes, it is difficult to justify the need for prioritizing, for example, web media such as YouTube over a file-sharing download – especially since in many cases this could involve an attempt to view the same exact content.[113] Allowing ISPs to adopt overly subjective definitions of 'real-time' would lead to unnecessary discrimination among different types of content and would also impact to a certain degree on the ability of content providers to rely on the types of applications that are expressly excluded from prioritization. Moreover, it would do so with little justification.

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[110] Sandvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, Appendix A, pp. 5, 23 of 24.
[111] Odlyzko, at para. 24.
[112] *Ibid*. See also, Sandvine, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 5.
[113] Participatory Culture Foundation, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, Miro facilitates downloading of videos from applications such as YouTube, but does so using a P2P protocol.

76. If the Sandvine solution were to be implemented in a manner that only prioritizes truly time sensitive traffic and targeted a reasonable level of congestion, then it would indeed be far less intrusive with respect to the values embodied in the Act. It may be true, as Rogers states in its comments, that P2P traffic may remain the most common target of throttling of upstream traffic (though this will *not* be the case for downstream). This is not because the P2P protocol makes disproportionate use of a network in general, but because few other applications involve symmetrical upload/download ratios within a given ISP network.[114] Moreover, this solution will only throttle P2P uploads if and when they are the actual cause of congestion on a given node. In that regard, it is minimally discriminatory against applications. As with the IETF proposals, such a practice would also still discriminate against some subscribers in favour of others merely for using more of the bandwidth they have purchased. However it does so based on real-time congestion and actual user contribution to that congestion and as such is minimally discriminatory. Also, if tailored to target only levels of congestion that cannot be addressed through provisioning, this method would not violate policy objectives aimed at improving Canadian internet infrastructure. It also lacks the privacy intrusive problems involved with identifying use of specific applications.

77. Overall, there are many practical alternatives to application-specific throttling. These various alternatives are far less intrusive with respect to the values embodied in the Act. With respect to the Sandvine proposal, there is also ample empirical proof that such measures are capable of alleviating any existing problem of traffic congestion that cannot be met through reasonable provisioning alone. In fact, the Sandvine and IETF proposals are probably more equal to the task of doing so in the future. As P2P and other file-sharing traffic continues to decline, throttling of such traffic will be less and less effective as a response to congestion.[115] However, application agnostic mechanisms such as those proposed by Sandvine and the IETF measures will provide enduring solutions to issues of unmanageable congestion that are not based on changing trends in application use.

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[114] Cogeco, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at para. 10.
[115] St. Arnaud at para. 29 and following.

78. Beyond these current available solutions are the ones that ISPs can invent. The Sandvine solution, which is far better tailored in terms of the values embodied in the Act, emerged as a response to regulatory action in the U.S. This demonstrates that alternative solutions to the problems identified by ISPs are available, and more to the point can be developed in the future on a case by case basis. However ISPs will not develop such solutions, nor will they adopt them, on their own. This is because ISPs are not sensitive to preserving the values embodied in the Act. That is the role of the Commission. By issuing a set of guidelines establishing what is and is not an 'unjust' or 'unreasonable' and therefore unacceptable infringement on the values embodied in the Act, the Commission can ensure that these values will be preserved. By doing so through the framework established here, which merely requires that ISPs achieve their reasonable network management purposes in a manner that is minimally intrusive of the values in the Act, the Commission can also ensure that ISPs are capable of achieving these objectives while allowing for a 'proliferation of philosophies'.

iii) Do the benefits of current ISP traffic management measures outweigh the detrimental impact of those measures?

79. As stated in its comments to the Commission in this proceeding, the CDM is of the position that the detrimental impact of application-based throttling far exceeds any benefits that may accrue to its networks from such practices.[116] Such throttling detract from the values protected by ss. 27(2), 36, and 7 of the Act, and the benefits gained from them are minimal.

Part III Legal Arguments

a) The Presence of Competition does not Justify Behaviour that would otherwise Violate Sections 27(2) or 36

80. TELUS argues in para.41 of its submission that the threshold for unjust discrimination and content interference (ie, violations of ss. 27(2) and 36) should be lower where competition exists and consumers have choices among service providers. TELUS's

[116] CDM, *Comments to Telecom Public Notice 2008-19*, February 23, 2009, at paras. 162-236, and *infra*, below.

reasoning is presumably that consumers in such circumstances can and will switch providers if they experience unjust discrimination or content interference, creating market demand for providers that do not engage in such practices and market pressure on those that do engage in such practices to stop.

81. The first flaw in this argument is obvious to anyone who observes actual competitive marketplace behaviour, both generally and with respect to the specific issue of traffic interference by ISPs. As the record of this proceeding demonstrates, even where consumers have options among service providers, it is often the case that all such providers either engage in the same general practice, or are subject to it (e.g., as resellers). Consumer choice among service providers is clearly ineffective as a means of influencing ISP traffic management practices.

82. Second, TELUS's argument ignores the potential and actual discriminatory effects of Traffic Interference on competing content producers, application providers, and others who are not simply consumers of internet access. As numerous parties have pointed out in their submissions, ISPs have enormous incentives to discriminate among traffic in ways that benefit themselves, their affiliates, or their preferred customers, under the guise of "traffic management".[117] Indeed, many emerging or competing content providers have already suffered as a result of such practices.[118]

83. Third, TELUS' argument ignores the fact that application-based throttling targets a minority of customers who happen to be early adopters of new technologies and often among the most creative and innovative content producers on the Canadian scene.[119] As the Documentary Organization of Canada points out in its submission:

> among our members, at least, and within the wider documentary community, it is the independent filmmakers, the emerging filmmakers, the young and the amateur filmmakers who are most likely – although clearly not exclusively – likely to seize on BitTorrent to distribute.

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[117] E.g., CFPTA paras. 40, 50; ACTRA para.13; CBC, paras.2, 3, 19, 20; IFTA, paras.11, 12; BCCLA para.21.
[118] See, for example, CFPTA paras.53. 54; Documentary Organization of Canada, Comment (Feb. 23, 2009) [DOC], p. 2.
[119] See for example the submissions of DOC, CBC, and the Independent Film and Television Alliance (IFTA).

> Mainstream filmmakers and larger, established filmmakers are likelier to have distribution arrangements that do not require alternative distribution models. Thus, current traffic management practices systematically favour maintstream media while burdening emerging and independent film.[120]

84. The IFTA makes the same point in its submission:

> In large part due to media consolidation of other platforms and the resulting scarcity of distribution opportunities, independent producers are increasingly using and reliant on the Internet as an alternative distribution platform for the distribution and marketing of independent content. They are also utilizing peer-to-peer and other innovative applications to distribute and market their content.[121]

85. Whether or not this targeting of a minority of users is intentional is irrelevant – the *effects* of the discrimination are what matters.[122]

b) Section 27(2): Unjust Discrimination and/or Undue Preference

i) Section 27(2) protects consumers as well as competitors

86. TELUS states that, in its view, "section 27(2) protects Internet content and application providers' ability to reach their users over the Internet, while section 36 protects Canadian Internet users' ability to access and use the legal Internet content and applications of their choice (subject to certain exceptions)." This admission explains TELUS's dismissal of arguments that involve discrimination against consumers or others who are not content or application providers. More importantly, it exhibits an extremely and inappropriately narrow interpretation of s. 27(2).

87. There is nothing in s. 27(2) that restricts its application to content, application or service providers as opposed to consumers. Indeed, the Commission (and its predecessor) has found violations of s. 27(2) with respect to consumers directly, in a number of cases.[123] Although these cases predate the modern introduction of competition in telecommunications, they demonstrate that there is nothing inherent in the legislation that

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[120] *Supra* note 118 p. 5, first para.
[121] Para. 8.
[122] *Auton v. British Columbia*, [2004] 3 S.C.R. 657 at para. 42, cited in CDM's Comments in *CAIP v. Bell* dated 3 July, 2008, which comments were incorporated by reference into CDM's Submissions in this proceeding.
[123] *E.g.*, *Tariffing of Unchannelized High Capacity Services*, Letter Decision CRTC 89-27; *Terra Nova Telecommunications Inc., General Increase in Rates*, Telecom Decision CRTC 85-12; *Bell Canada, Increase in Rates*, Telecom Decision CRTC 77-7; *Bell Telephone Co. v. Ontario* (1922), 27 C.R.C. 277 (B.R.C.)).

restricts its application as TELUS suggests. Rather, each case must be decided on its facts, with reference to the statutory policy objectives, relevant Orders in Council, and the *Telecommunications Act* as a whole. It may be that the existence of competitive alternatives is found, in a given case, to justify the impugned discriminatory practice. (See reply argument on transparency, below.) But this does not mean that s. 27(2) should never be applied to discrimination against customers directly. The existence of competitive alternatives is not the only relevant consideration in s. 27(2) cases.

ii) The justness of targeted P2P throttling depends on more than the nature of P2P

88. In paras. 128-135 of its submission, Bell argues that targeting P2P traffic is "just" discrimination for traffic management purposes because P2P by its nature (a) consumes all available bandwidth, and (b) is not time sensitive and thus does not suffer from such throttling to the same extent that more time-sensitive applications do. Other ISPs make similar arguments.[124] Such arguments are fundamentally flawed insofar as they (a) assume that throttling is necessary in order to maintain network capacity when in fact it is not, and (b) ignore other, less intrusive, methods of managing network congestion.

89. As noted by CDM in its initial submission, there are numerous alternative methods of managing network congestion, most of which are significantly less intrusive and discriminatory than targeting a particular internet application (that happens to carry competitor traffic). It appears that neither Bell nor other ISPs throttling P2P have exhausted such alternative methods before resorting to application-based throttling.

90. Indeed, as many other parties have pointed out, developments in the United States (i.e., Comcast's response to the FCC ruling on its throttling of P2P traffic) clearly prove that application-based throttling is not necessary in order for cableco-based ISPs to manage congestion on their networks. And the fact that TELUS does not engage in application-based throttling is clear evidence that such throttling is not necessary in order for DSL-based ISPs to manage congestion on their networks.

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[124] *E.g.*, Rogers para. 4; Barrett Explore para. 10.

91. Moreover, despite unanimity among and repeated assertions by ISPs that P2P "eats up all available bandwidth" such that expanding capacity will not solve congestion problems, there is evidence on the record of this proceeding from other, less vested interests that the congestion problem claimed by ISPs is not caused solely by P2P traffic. Skype, for example, states at para.13 of its submission that "There is nothing inherent in P2P technology that makes P2P traffic more of a congestion threat than other traffic." And Dr. Andrew Odlyzko has testified that ISPs are capable of meeting current rates of traffic growth with modest rates of investment, without resorting to application-based throttling.[125]

iii) Congestion relief is not the only purpose of P2P-targeted throttling by ISPs

92. Indeed, the record of this proceeding clearly shows that ISPs have a strong incentive to use, and are using, "traffic management practices" to achieve a number of goals of which congestion relief is just one. As the Heavy Reading report states, technologies such as Deep Packet Inspection have "a broad range of potential applications", and "are also often used to give preferential treatment to an ISP's own applications or premium-tier subscribers, to manage the growing range of security threats, and for traffic monitoring and analysis, among other things."[126]

93. For example, Sandvine points out in its submission that its services are useful to ISPs for a wide range of purposes: "Sandvine provides "Network Policy Control" solutions that allow service providers to define and deploy network-wide policies to address a wide variety of operational needs, from a single unified platform."[127] And Arbor notes in its submission:

> Deep packet inspection from Arbor has been used by ISPs and Carriers around the world to eliminate congestion in the network during peak hours (when the network capacity is oversubscribed) and actually improve service to the end-user for applications such as web browsing,

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[125] Attachment A to the CDM Submission; see esp. paras. 16-21.
[126] Heavy Reading, *ISP Traffic Management Practices: The State of the Art* (2009) http://www.crtc.gc.ca/PartVII/eng/2008/8646/isp-fsi.htm , Executive Summary.
[127] Sandvine, Comment (23 February, 2009) para. 17.

> video streaming and voice calling. **Because deep packet inspection can be used to also prioritize traffic and time-shift file sharing into off-hours, ISPs can save millions of dollars in capital expansion costs** that would be necessary in order to meet growing bandwidth demands even without new subscriber acquisition.[128] *(emphasis added)*

94. While ISPs are to be encouraged to use their networks efficiently, at some point the substitution of interventionist traffic management for non-interventionist capital expansion is sub-optimal from a public interest perspective – i.e., from a perspective that is driven by achievement of telecommunications policy goals rather than maximization of private shareholder value. It is incumbent on the Commission to define that point as clearly as possible and as soon as possible, so as to ensure that key policy goals such as innovation, competition and diversity of voices are not undermined by anti-competitive and anti-consumer ISP practices hidden under the guise of "traffic management".

95. Moreover, as numerous parties have pointed out, ISPs have a strong incentive to use traffic management tools in ways that frustrate or prejudice providers of content, applications or services that compete with that of the ISP, its affiliates, or its preferred customers. As the CBC states at paras. 3 and 19 of its submission:

> ...there is a clear opportunity and incentive for ISPs to use traffic management as a way of either favouring their own or affiliated services, or generating new revenue streams from third parties seeking preferential treatment. ....
>
> For example, a mobile wireless service provider could "manage" Internet traffic so that Internet-based news and weather services were not as convenient or quick to access as the mobile carrier's own, non-Internet based news and weather services.

96. As the Canadian Film and Television Production Association notes in its submission, P2P applications are being used by a number of emerging and established independent producers as the primary distribution for original content (para.53), and such uses are considered by large Canadian ISPs to be a threat to their traditional broadcasting distribution and programming services (para.65). The CFPTA points out that:

> ...under the questionable guise of "traffic management", discriminatory traffic throttling enables ISPs to accord differential treatment to applications and protocols based solely on their own determinations of

[128] Response to Q.9(2)(d).

> what they claim is necessary to relieve congestion on their networks. This is particularly problematic when ISPs throttle P2P applications, which have become one of the principle vehicles for distributing audio-visual content, including Canadian audio-visual content, on the Internet.[129]

97. It would be naive for the Commission to expect that ISPs will not discriminate against competing interests where such discrimination is difficult to detect or to separate from legitimate traffic management activities. Broad rules against unjust discrimination will not prevent such behaviour; such rules must be supplemented with clear and concrete restrictions on easily abused traffic management practices.

98. Waiting to impose such restrictions until significant competitive harm has occurred would be irresponsible and reckless, in CDM's submission, since by then the damage will be done. As the Independent Film and Television Alliance stated in its submission (para.12):

> The actual evidence of the harm of discriminatory or preferential practices and the resulting limitations on diverse and independent content and applications may not be realized until the implementation and use of traffic management practices and allocation of tiered Internet services are commonplace. At that point, the supply of lawful independent content and applications will be irreparably harmed as well as the corresponding public demand for such content. If network management practices are allowed to develop absent necessary safeguards, there will be no room for independently produced content and applications in the "walled gardens" of the ISPs tiered services. Independent content will disappear because the current remedy for questionable network management practices entails an uphill battle by the complainant after the harm is caused. Such recourse will fail to effectively prevent an inevitable decline in independent content. Since the public is unable to exercise decision over network management practices and the potential impact to access and diversity, the Commission should ensure safeguards exist that protect and promote public access to legal content and applications. *(emphasis in original)*

iv) Clear evidence of discrimination against particular content producers and distributors

99. CDM notes that the record of this proceeding, unlike that in the *CAIP v. Bell* proceeding, is replete with evidence of the adverse effects of ISP discrimination against P2P

[129] Para. 50.

applications. For example, the Documentary Organization of Canada states in its submission (at pp.3-4):

> DOC believes that throttling by ISPs already results in unjust discrimination against legitimate users of P2P file sharing and BitTorrent, including both content distributors (filmmakers) and content consumers (documentary downloading audience).
>
> While different filmmakers use BitTorrent technology in varying degrees, throttling threatens a widely recognized community reality. The voices and films of independent filmmakers, and of lower-budget emerging and activist filmmakers in particular, are caught in the crossfire of this Internet management practice. This places independent filmmakers at a distinct disadvantage, especially those who are unable to secure large budgets and traditional mechanisms of distribution such as theatres and television. If a filmmaker wants her film to be seen and to maximize her audience, Internet distribution including P2P file sharing is one of the best available options.
>
> While other online distribution options to BitTorrent do exist, such as YouTube and sometimes even direct downloads from filmmakers' own sites for free or pay, there are limitations with both. Picture quality with YouTube is limited and films distributed through that mechanism must adhere to file size and video/movie length limits – currently limited to ten minutes maximum for regular users. In other words, the film would need to be cut-up in installments and segmented. For the filmmaker who approaches her work with passion and in many ways as a labour of love, control over the quality of distribution is not inconsequential. Second, for a filmmaker to host her own server is a luxury that not many can afford. The utility of BitTorrent is that it makes it possible to distribute content in very high quality for those unable to invest in a large server and expensive bandwidth. The significant cost associated with establishing a hosted server coupled with the continued practice of throttling will result in fewer Canadian voices and documentary content distributed in the national cultural marketplace of ideas. DOC believes that these voices are thus placed at an undue competitive disadvantage by throttling practices.

v) Circular arguments

100. TELUS' argument under s. 27(2) is circular. First, TELUS summarizes the Commission's past interpretation of this provision, noting that practices will generally be found to be unjustly discriminatory where the preference or advantage conferred by the practice is unreasonable.[130] TELUS then states that "reasonable network/traffic

[130] Para. 44-45.

management practices are those technical measures undertaken in a manner that is not unjustly discriminatory..."

101. This unhelpful approach to applying s. 27(2) is compounded by TELUS' cautioning "against an attempt to pre-define what kinds of traffic management practices might constitute unjust discrimination or undue or unreasonable preference or disadvantage because the determination will always be fact-driven."[131] The purpose of this proceeding is precisely to get the facts in order to make a determination that does not "pre-define" but rather provides much-needed guidance to the industry and the public on a highly contentious issue.

vi) Transparency is necessary but not sufficient to justify Traffic Interference

102. In para.134 of its submission, quoting from Professor Catherine Rosenberg, Bell appears to concede that, in order for discriminatory traffic management practices to be "just" under s. 27(2), they must be clearly disclosed to the public.[132] However, it appears that Bell considers mere disclosure of discriminatory practices to be sufficient in order to render such practices "just" under s. 27(2). TELUS seems to be making a similar argument when it argues in para.41 of its submission that the threshold for "unjust discrimination" under s. 27(2) should be lower where consumers have competitive choices.

103. As noted above, this argument is based on a simplistic theory of competition and consumer behaviour that is not reflected in the market reality of Canadian telecommunications. Disclosure of traffic management practices by ISPs is critical in CDM's view, and will offer consumers one more piece of information with which to compare ISP service offerings. But there are many other factors that will go into most consumer purchasing decisions including price, features and quality reputation. Thus, traffic management practices may not be determinative, even where they are important to consumers. Moreover, most internet consumers have neither the time nor the technical

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[131] Para. 49.
[132] ISPS "...should be transparent in explaining what their philosophy and guiding principles are."

understanding necessary to make informed choices on the basis of ISP traffic management practices.

104. Similar realities exist with respect to other service, application or content providers who use ISP telecommunications services or facilities. As Skype points out in its submission (para.26):

> It is important to note that while disclosure requirements are important, they do not solve all traffic management issues. Many network operators' Terms of Service include broadly worded provisions that entitle the network operator to change its traffic management practices at any time, leaving application developers lacking the certainty required to invest in innovative products and services. Moreover, even if a network operator accurately discloses its traffic management practices, application developers may be left in a situation in which it has to monitor and adapt to different traffic management on different networks — a costly and wasteful exercise when the application developer is trying to produce a product that operates across Canada, let alone worldwide.

105. Thus, transparency of practices by ISPs does not make an otherwise unjust practice just, and must not be treated as the sole solution to the ISP traffic management problem.

c) Section 36: Controlling Content or Influencing the Meaning or Purpose of a Telecommunication

i) Significant distortions or delays of telecommunications influence the meaning or purpose of such telecommunications

106. ISPs in this proceeding argue that s. 36 does not apply to traffic management practices because there is no editorial interference with content and no attempt to control or alter the content *per se* of affected traffic. Merely slowing traffic, in Bell's submission, does not amount to "controlling content". Because their traffic management practices focus on applications as opposed to content, ISPs argue that such practices do not implicate s. 36.

107. These arguments fail to appreciate that it is *effects* of such practices that are at issue, not simply their purposes.[133] And the evidence submitted by numerous parties in this proceeding clearly establishes that targeted P2P throttling, by delaying and distorting P2P communications, has a serious adverse effect on the content, meaning and purpose of P2P telecommunications. Indeed, the IFTA states in its submission that "throttling [P2P] applications effectively blocks the public's access to the content."[134]

108. As the Documentary Organization of Canada states in its submission:

> Many documentary filmmakers now routinely use BitTorrent: 1) as the sole or primary method to distribute their films; and 2) as part of a multi-distribution strategy to reach as broad an audience as possible – legally, openly and purposefully. Throttling of file sharing applications slows down file transfer speeds to the point of hindering the utility of such applications as a robust medium of distribution and, when at its worst, can make it virtually impossible to transfer files through such applications at all. In either circumstance the ability of documentary filmmakers to distribute their work is impeded.[135]

109. CDM submits that the evidence provided to the Commission in this proceeding shows that P2P throttling can and does delay and distort communications to such an extent as to render the communications useless in many cases. As the CBC points out, ISPs can use traffic management techniques to slow down competing news and weather services for which timeliness is critical. By frustrating timely access to such time-sensitive content and services, ISPs are not only engaging in unjust discrimination but are also influencing the purpose of competing content or services and diminishing their value to end-users.

110. CDM therefore agrees with the CBC that:

> an Internet traffic management practice would contravene section 36 of the Act if it involved either blocking access to a website or altering a communication over the Internet so as to significantly distort the content of the communication or frustrate timely access to the content.[136]

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[133] See *Auton v. British Columbia*, *op cit.*
[134] Para. 8.
[135] Doc, *supra* note 118, p. 2.
[136] Para. 23.

111. CDM submits that that this is precisely the effect that P2P throttling has had in Canada: significant distortion of content and/or frustration of timely access to such content.

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