



July 23, 2008

Mr. Robert Morin  
Secretary General  
Canadian Radio-television and  
Telecommunications Commission  
Ottawa, ON K1A 0N2

Dear Mr. Morin:

**Subject: Application by the Canadian Association of Internet Providers (CAIP) requesting certain orders directing Bell Canada to cease and desist from “throttling” its wholesale ADSL Access Services**

Pursuant to Commission staff’s letter dated 15 May 2008 as amended on 18 July 2008, attached is CAIP’s Final Reply in the above-noted proceeding.

On or around 14 March 2008, Bell Canada (Bell) began using Deep Packet Inspection (DPI) technology to throttle back the transfer speeds of its wholesale Gateway Access Service (GAS). Bell did so without notice or explanation of any kind to the competitors that subscribe to this service and without prior Commission approval.

In its Application, CAIP sought a number of orders declaring that Bell’s throttling of GAS customer traffic breached sections 24, 25, 27, and 36 of the *Telecommunications Act* (The Act) and mandating Bell to cease and desist from same.

CAIP submits that its Application is well-founded and should be allowed. Bell’s prevaricating, after-the-fact explanations do not justify its failure to seek approval from the Commission before throttling back the speed of the GAS service or in the totality of the evidence and surrounding circumstances, the throttling of GAS service itself.

CAIP notes that in the last two months, an unprecedented number of individual Canadians have come forward to support its Application. While many Canadians are unhappy about Bell’s retail Internet access service and have not been shy to say so, they also understand that what is at stake in this proceeding is the availability of competitive alternatives to Internet access and numerous other retail telecommunications services provided by Bell and other ILECs. Bell’s throttling of competitor GAS arrangements puts into Bell’s hands control over the pace and extent of competition in downstream retail markets. The Commission has recently re-affirmed that there are insufficient wholesale alternatives to the last mile access and transport functionality of GAS service for competitors. Furthermore, failure to enforce the provisions of

Mr. Robert A. Morin  
July 23, 2008

Page 2 of 2

the Act and the Commission's long-standing policies would be used by ILECs in myriad situations to shape other forms of competitor traffic under the guise of "traffic management".

CAIP's Application is well founded in law and is consistent with the Canadian telecommunications policy objectives of promoting competition sufficient to protect the interest of end-users and in protecting the privacy of telecommunications. Canadians are waiting and watching the outcome of this proceeding to ensure that instances of anti-competitive conduct are decisively dealt with by the Commission.

CAIP notes that further to its process letter dated 16 July 2008, it has not yet been advised of the identity of the individual GAS customer whose data is purportedly reflected at paragraphs 25-26 and Figure 17 of Bell's Final Answer dated 11 July 2008. However, it understands that the individual GAS customer intends to file a brief response to the information placed before the Commission in its regard.

CAIP regrets that it was unable to file its Reply on 22 July 2008 because it was unable to access the Commission's website over a period of approximately 24 hours from Sunday, 20 July 2008 to Monday, 21 July 2008. CAIP understands that this may have been due to a power outage at the Commission. CAIP sincerely apologises for any inconvenience that this may cause.

Yours truly,

A handwritten signature in black ink, appearing to read "Tom Copeland", with a horizontal line underneath.

Tom Copeland

Chair  
Canadian Association of Internet Providers  
Suite 416, 207 Bank Street  
Ottawa, ON  
K2P 2N2  
613-236-6550 - Ottawa  
905-373-9313 - Cobourg

**Before the Canadian Radio-television  
and Telecommunications Commission**

**REPLY OF THE  
CANADIAN ASSOCIATION OF INTERNET PROVIDERS**

**23 July 2008**

**TABLE OF CONTENTS**

EXECUTIVE SUMMARY.....3

I. INTRODUCTION AND OVERVIEW..... 1

    A. Public Participation.....2

    B. Factual Issues ..... 3

    C. Grounds for Relief ..... 4

II. GAS SERVICE.....5

III. TECHNOLOGY ..... 10

    A. Deep Packet Inspection ..... 10

    B. P2P Networks ..... 11

IV. DEPLOYMENT OF DEEP PACKET INSPECTION BY BELL CANADA..... 17

    A. Impact of Bell’s Conduct on its Competitors ..... 19

    B. Effects of Bell’s Conduct on End-Customers of GAS.....20

V. BELL’S RATIONALIZATIONS FOR ITS DEPLOYMENT OF DISCRIMINATORY TRAFFIC SHAPING MEASURES.....22

    A. The Alleged Problem of the 5 per cent of Heavy P2P Users .....22

    B. Bell’s Methodology for Measuring Link Congestion is Flawed .....25

    C. Cell Loss Statistics Do Not Prove that Congestion Exists.....28

    D. Bell Has Offered No Relevant Data Supporting Its “Customer Experience” Arguments .30

    E. Proof Positive That There Is In Fact No Pressing Congestion Problem in Bell’s Network Warranting the Extraordinary Measures Undertaken by Bell .....32

    F. Bell Has Provided No Evidence that Competitors Cause Congestion .....32

    G. DPI is an Inappropriate Solution to Congestion Problems .....34

VI. BELL’S THROTTLING OF COMPETITOR TRAFFIC IS CONTRARY TO SECTIONS 24 AND 25 OF THE TELECOMMUNICATIONS ACT.....37

    A. Speed Is Intrinsic to the Definition of GAS Service .....38

    B. Bell’s Throttling Has Nothing to Do with Fair and Proportionate Use as There is No Evidence of Unfair and Disproportionate Use .....41

VII. BELL’S THROTTLING OF COMPETITOR TRAFFIC VIOLATES SECTION 27 OF THE ACT 44

    A. Discrimination Against and Disadvantage to P2P (And Other) Users and Content Providers .....46

    B. Disadvantage to Competitors and Competitors’ End-Users.....48

    C. Preferential Re-Allocation of Bandwidth to Bell’s Ultra High-Speed Internet Access and other Services .....48

    D. Bell’s Answer to CAIP’s Section 27 Concerns .....49

    E. Unjust or Undue Nature of Bell’s Discriminatory/Disadvantageous/Self-Preferential Measures.....50

VIII. LACK OF NOTICE OF NETWORK CHANGES .....54

IX. VIOLATION OF COMMON CARRIER OBLIGATIONS.....58

X. BREACH OF END-USER CUSTOMER PRIVACY .....64

XI. CAIP’S REQUESTED RELIEF IS CONSISTENT WITH THE PUBLIC INTEREST AND THE CANADIAN TELECOMMUNICATIONS POLICY OBJECTIVES .....68

XII. CONCLUSION AND RELIEF REQUESTED.....70

Appendix I – CAIP’s Analysis of Lack of Wholesale Alternatives to GAS and other Wholesale DSL services..... 1

Appendix II. Table of Individual Public Comments ..... 1

### **Executive Summary**

- i. On or around 14 March 2008, Bell Canada (Bell) began using Deep Packet Inspection (DPI) technology to throttle back the transfer speeds of its wholesale Gateway Access Service (GAS). Bell did so without notice or explanation of any kind to the competitors that subscribe to this service and without prior Commission approval.
- ii. The inspection and deliberate and drastic slowing of competitor traffic by Bell alone among Canadian ILECs constitute a clear violation of sections 24, 25, 27 and 36 of the Telecommunications Act (the Act).

### **The GAS Service**

- iii. GAS is a mandated, standalone, and independent service that provides an opaque pipe (opaque to Bell, the carrier), between the end-user's premise all the way to the AHSSPI. It is not a "white-label" Internet access service but rather, can be used by competitors to provide a wide variety of retail telecommunications services (i.e. not just Internet access services). The speed and capacity of the service at both the end-user premises and at the AHSSPI are defined characteristics of the service and are contained in the GAS tariff. Notwithstanding the foregoing, Bell asserts in its Final Answer as it has done for the past four months that it is entitled to inspect the traffic carried over GAS lines and to throttle back the speed of GAS service by as much as 90 per cent.

### **Bell's Prevaricating Rationalisations Are Without Merit**

- iv. Bell has provided successive but equally unconvincing explanations for the critical need to shape the traffic of its competitors' end-users. First, the company claimed that shaping of its competitors' end-user traffic was necessary in order to discipline the abusive conduct of a small number of users allegedly abusing Bell's network. This argument was obliterated by the confused and contradictory answers provided by Bell in response to a Commission interrogatory regarding this statement.
- v. Next, Bell claimed that peer-to-peer (P2P) traffic in general was causing traffic congestion that represented an overwhelming threat to its networks and a degraded "Internet experience" for end-users. CAIP notes that Bell's explanation of P2P technology does not fairly represent it and appears to have been calculated to withhold important information in relation to it. Contrary to Bell's assertions, the use of P2P applications to transfer content through the Internet does not consume more bandwidth than the use of other client-server architectures. Bandwidth effects are generally only associated with P2P uploads. Also, any bandwidth effects associated with P2P are entirely contingent on whether or not congestion actually exists over a given link. If the link is not congested, then none of Bell's claims regarding P2P's disproportionate use of bandwidth apply. Even if a given link at a given point in time is congested, it is important to note that a P2P application cannot take up more bandwidth than that which is defined by the speeds at the source and destination of the communication. In terms of traffic, it makes no difference whether content is transferred through P2P or any other protocol. It is misleading to argue that a movie or television program takes up more bandwidth over the last mile because an individual chooses to access that content through P2P.

- vi. Finally, Bell appears to have retreated still further while opening up the broadest front possible, in claiming that it is entitled to deliberately throttle the speed of competitor services by virtue of its status as a Canadian carrier. In its public statements and submissions to the Commission, Bell has remained unapologetic and non-conciliatory for the high-handed and abrupt manner in which it instituted this major change to its relationship with its wholesale customers.

### **No Evidence of Congestion**

- vii. Whether or not one gives Bell the benefit of the doubt regarding the reason behind its varying storylines, Bell's rationalisations require that it establish persuasive and serious congestion in its network (since that is how it has chosen to throttle its competitors' traffic) and a causal link between such congestion and its competitors' traffic.
- viii. Bell has failed to offer documentary evidence of significant congestion on its network:
  - a. Bell uses a flawed methodology for determining network congestion, which is not based on any measurements of actual congestion in its network;
  - b. Bell has an enormous surplus of capacity in its network, including in that portion of its network, which Bell claims is the most congested;
  - c. Despite Bell's assertion that congestion is a problem that exists throughout the shared portion of its network, CAIP's members did not experience any of the effects of such congestion, such as dropped packets and latency, in any period of time prior to the introduction of traffic shaping measures by Bell. Other parties to this proceeding who subscribe to Bell's GAS service, such as Primus, Distributel and Acanac, also report that they did not observe any of the effects of network congestion prior to the introduction of traffic shaping measures by Bell; and
  - d. Bell has offered no documentary evidence that supports its oft-repeated claim that its traffic shaping practices are justified because they improve the experience of all users on its network. In actual fact, Bell's traffic shaping practices have diminished the experience for a large proportion of users, just so that Bell can free up bandwidth for its Bellvideostore.ca service and its 7 Mbps and 16 Mbps retail Internet access services.
- ix. Furthermore, Bell's evidence demonstrates no causal link between the alleged congestion problem and the P2P traffic of competitors.
- x. In chorus with numerous interested parties who submitted evidence to the Commission, CAIP notes that even if there is a network problem caused by Internet traffic growth, then there are alternatives that exist to deal with such congestion, which are far less discriminatory, intrusive, and disruptive to end-users.
- xi. The fact that Bell alone among ILECs is throttling is persuasive evidence that there are viable alternatives to throttling available to a reasonably efficient ILEC. Some of these alternatives include the following:

- a. Throttling only when and where congestion actually occurs in Bell's network and, in these specific instances, all packet data traffic should be the subject of traffic management measures as opposed to just P2P traffic originating to/from the Internet;
- b. Collaborating with protocol/application developers to design P2P and other applications that manage traffic more efficiently and less intrusively;
- c. Caching popular P2P files (Oversi Inc. is developing a system for this); and
- d. Educating and empowering end-users to limit demand in peak periods by providing them with software tools to manage down/uploading.

### **Grounds for Relief**

- xii. Having addressed the essential and relevant facts in this Application, CAIP responds to Bell's arguments with respect to each of the grounds raised by CAIP in support of its Application as follows.

#### *Sections 24/25 (Breach of tariffs and tariffing requirements)*

- xiii. GAS service is mandated by the Commission. The speed of the service at both the end-user customer's end and the AHSSPI are intrinsic characteristics of the service. Intentional degradation of the speeds (as opposed to speed effects attributable to the ADSL technology itself, *i.e.* distance from CO/remote, quality of the copper, etc.) is not permitted under the tariff. CAIP submits that the throttling back of the speed of GAS violates sections 24 and 25 of the Act. Bell's contention that the impugned measures constitute justifiable traffic management to address a pressing network issue is completely unfounded because there is no urgent and pressing congestion issue in Bell's networks. Even if congestion were a serious issue, Bell's Terms of Service cannot override the provisions of the Act and are intended to address specific and individualised instances of abuse rather than the blanket and systematic throttling of traffic in which Bell has engaged.

#### *Section 27 (Unjust Discrimination/Undue Disadvantage or Preference)*

- xiv. Bell's degradation of the speed of GAS service:
  - a. unjustly discriminates against content users and P2P content providers;
  - b. subjects competitors and their users to an unreasonable disadvantage by degrading GAS service; and
  - c. confers on Bell an unreasonable preference by reallocating competitors' bandwidth to new revenue-generating services other than the retail Internet access services that Bell provides.
- xv. Bell misunderstands the ambit of CAIP's section 27 arguments (as augmented by comments of other interested parties). Bell misleadingly states that CAIP's only section 27 argument relates to discrimination in the retail Internet access market. First of all,

P2P traffic shaping unjustly discriminates against content and application providers and users of P2P applications. Second, throttling back of competitors' GAS traffic unreasonably degrades and disadvantages competitors' GAS services, a number of downstream retail services, and end-users of GAS subscribers. It also "frees up bandwidth" that Bell may then re-allocate to itself in an unreasonably preferential way. Indeed, Bell has launched 7 Mbps and 16 Mbps retail Sympatico offerings as well as a highly bandwidth-intensive video offering. Not only is there no congestion in Bell's network, these preferences and disadvantages are unreasonable given that GAS is a tariffed service. Bell has in no way discharged its onus of proving, pursuant to subsection 27(4) of the Act, that the disadvantages and preferences that it is conferring are neither unjust, undue or unreasonable.

*Lack of Notice of Network Changes*

- xvi. In addition, CAIP submits that the lack of notice to competitors and Bell's failure to seek prior approval of the Commission before fundamentally modifying the GAS service breaches the Commission's long-standing policies that require carriers to notify wholesale customers of network changes that affect the carrier services provided. GAS is a mandated service that has recently been found by the Commission to be the only economic alternative by which a competitor can obtain ADSL functionality between an end-customer's premises and the competitor's point of presence. A change to the maximum speed of the service, even for selected time periods and the targeted data type, fundamentally affects downstream retail telecommunications services, including Internet access services provided by competitors using GAS service. GAS service and the changes implemented by Bell in relation to GAS service clearly fall within the ambit of the Commission's long-standing requirement for notification of network change policies.

*Breach of Bell's Common Carrier Obligations;*

- xvii. Bell's modifications of GAS service clearly breach the section 36 prohibition on a carrier "controlling the content" or "influencing the meaning or purpose of telecommunications carrier by it for the public" absent Commission approval of same. At the most basic level, Bell violates the common carrier principle by inspecting and throttling back traffic that it is supposed to transmit from point A to point B at defined speeds in a completely "opaque" fashion. In addition, Bell's traffic shaping measures do not merely slow down (albeit drastically) the carriage of traffic but it also causes bits of data to be dropped. This would mean that the actual content of a packet is being deleted, dropped, and hence deliberately modified. In addition, in the context of ever increasing consumer expectations of convenient and instant communications, it is disingenuous for any carrier to claim that "eventual" delivery of telecommunications does not alter the usefulness and therefore, the purpose of telecommunications.

*Breach of End-User Privacy*

- xviii. Bell's traffic shaping also constitutes a breach of the privacy of telecommunications. Both the *Criminal Code* and the *Privacy Act* enshrine the sanctity of the privacy of telecommunications. The *Act* requires that the Commission exercise its powers with a view to promoting and protecting the privacy of telecommunications.

- xix. In order to properly route packets of data in an IP network, a carrier must examine the packet header that contains the originating and destination IP address. However, it is abundantly clear from the evidence in this proceeding that Bell is actually looking at the packet's payload in order to determine the type of content that is contained in all packets and for certain types of content, impeding these packets from reach their intended destination. The act of peering into packets to the extent that Bell is constitutes a breach of privacy.

### **The Public Interest**

- xx. Apart from the breaches that directly affect CAIP's members, this proceeding and its outcome will have a significance beyond the immediate interests of the parties. If the Commission fails to act in this instance, ILECs will have been given a blank cheque to institute all kinds of other traffic management techniques at will, without notice, to shape whatever competitors and whatever traffic the ILECs next feel or determine represents a "threat" to their networks. Bell is unapologetic. It states that deliberate degradation of one of the GAS service' most defining characteristic (speed) is simply standard network management. CAIP submits that the measures undertaken by Bell are nothing of the kind and that the Commission should move decisively to enforce the *Act* in this case.
- xxi. The Commission is aware that Canadians across the country are intently watching to see whether the Commission will be taking into consider from their interests and the public interest and not solely the perspective of the regulated carrier, in rendering its decision in this matter. Over 1361 individual Canadians have voiced their concern over harm to the public interest as it relates to the grounds raised by CAIP in its Application. Canadians have decried the anti-competitive nature of these measures, and the non-transparent manner in which Bell has implemented traffic shaping. Canadians have voiced concerns regarding the privacy of their telecommunications and the fact that an array of legitimate and socially, economically and culturally important information and activities, once available to them through P2P applications, are now virtually inaccessible to them during their leisure hours. Canadians have also noted that they have consciously chosen an alternative provider because they wanted an alternative to the product and service offerings of Bell or other ILECs. Canadians understand that if Bell is allowed to shape their competitors' end-user traffic, Bell can effectively render competitors' products and service offering indistinguishable from its own, thereby eliminating competition in downstream retail markets.
- xxii. The effect of Bell's throttling is to preclude competitors' ability to market and sell differential product and service offerings to end-user customers. If Bell is permitted to continue to shape the traffic of end-users subscribed to competitors, it will in the future do so in a similar manner for other types of traffic, at undisclosed locations, without notice or joint testing of any kind under the guise of "network management."
- xxiii. This result would violate many of the Canadian telecommunications policy objectives relating to the important role of reliable and efficient telecommunications in furthering the social, economic and cultural development of Canada and Canadians. Bell's actions fundamentally undermines competition these objectives in addition to violating the *Act* and the Commission's pre-existing policies as identified above.
- xxiv. The Commission need not establish any new regulations or principles in order to determine CAIP's Application in its favour. Bell has clearly breached existing provisions

of the Act, regulations and Commission's policies with respect to ensuring the interoperability and interconnection of telecommunications networks of Canadian carriers.

- xxv. For the foregoing reasons, CAIP respectfully requests that the Commission grant the relief requested by CAIP in its Application.

## I. INTRODUCTION AND OVERVIEW

1. On or around 14 March 2008, Bell Canada (Bell) began using Deep Packet Inspection (DPI) technology to throttle back the transfer speeds of its wholesale Gateway Access Service (GAS). Bell did so without notice or explanation of any kind to the competitors that subscribe to this service and without prior Commission approval.
2. On 3 April 2008, the Canadian Association of Internet Providers (CAIP) filed an application with the Commission (the Application), pursuant to Part VII of the CRTC Telecommunications Rules of Procedure, seeking a number of orders declaring that Bell's throttling of GAS services breached sections 24, 25, 27, and 36 of the *Telecommunications Act* (The Act) and mandating Bell to cease and desist from same, as follows<sup>1</sup>:
  1. *A final order directing Bell Canada to cease and desist from using any technologies to "shape", "throttle" and/or "choke" its wholesale ADSL services;*
  2. *An order that Bell comply with the terms and conditions of its wholesale ADSL tariffs;*
  3. *A declaration that Bell has acted unlawfully and in a manner that is contrary to tariffs approved by the Commission;*
  4. *An order that Bell not deviate from the terms and conditions of its approved wholesale ADSL tariffs without prior Commission approval of any such changes;*
  5. *A declaration that Bell has acted unlawfully and in a manner that is contrary to the requirement that a local exchange carrier that provides service to other local exchange carriers provide advance notice of network changes, pursuant to Local Competition, Telecom Decision CRTC 97-8 (Decision 97-8);*
  6. *A declaration that Bell has granted to itself an undue and unreasonable preference and subjected independent ISPs to an undue and unreasonable disadvantage by shaping, throttling and choking its wholesale ADSL services in the manner described in this Application; and*
  7. *A declaration that Bell has acted unlawfully and contrary to the prohibition against carrier interference with the content of messages carried over its telecommunications network contrary to section 36 of the Act and*

---

<sup>1</sup> CAIP's requests for interim relief were denied by the Commission in Telecom Decision CRTC 2008-39, *Canadian Association of Internet Providers' request for interim relief regarding Bell Canada's practice of "throttling" its wholesale ADSL access services*, 15 May 2008 ("Decision 2008-39").

*contrary to the Canadian telecommunications policy objectives set out in paragraphs 7(a) and (i) which, inter alia, seek to protect the privacy of persons.*<sup>2</sup>

3. Pursuant to Commission staff's 15 May 2008 letter, as amended on 18 July 2008, this submission constitutes CAIP's reply in relation to its Application for the foregoing relief.

#### **A. Public Participation**

4. In addition to Bell's Answer dated 11 July 2008, CAIP is in receipt of comments from 25 interested parties as well as hundreds of submissions and letters of support from over 1300 individual Canadians. Only two of these roughly 1361 submissions, namely those filed by TELUS Communications Company<sup>3</sup> (TELUS) and Cisco Systems, Inc., (a telecommunications equipment manufacturer with a vested interest in selling DPI equipment to carriers), expressed support for Bell.
5. Rogers Communications Inc.<sup>4</sup> (Rogers) and the Information Technology Association of Canada<sup>5</sup> (ITAC) expressly stated that they would take no position on the merits of the Application.
6. As indicated, all other interested parties, including over 1300 individual Canadians, supported CAIP's Application. Among the 25 interested parties who submitted comments in this proceeding are other competitors that subscribe to Bell's GAS service,<sup>6</sup> content providers,<sup>7</sup> VoIP providers,<sup>8</sup> other industry associations,<sup>9</sup> the world's largest Internet company, Google, Inc.,<sup>10</sup> industry associations, end-users,<sup>11</sup> consumers' groups,<sup>12</sup> and civil liberties' groups.<sup>13</sup> Several of these other participants were equally opposed or concerned about Bell's shaping of its own retail end-users' traffic.

---

<sup>2</sup> CAIP Application, 3 April 2008, page 3, paragraph 11.

<sup>3</sup> TELUS, 3 July 2008.

<sup>4</sup> Rogers, 3 July 2008.

<sup>5</sup> ITAC, 30 June 2008.

<sup>6</sup> Acanac Inc., 3 July 2008; Coalition of Internet Service Providers Inc. (CISP), 3 July 2008; Distributel Communications Limited, 3 July 2008; Primus Telecommunications Canada Inc., 3 July 2008; Vaxination Informatique, 3 July 2008; Wireless Nomad, 22 April 2008.

<sup>7</sup> Kaboose Inc., 9 June 2008; TCPub Media Inc., 9 June 2008; Redwire, 3 July 2008; Per Vices corporation, 2 July 2008

<sup>8</sup> Skype Communications s.a.r.l., 12 June 2008, Canadian Association of Voice Over IP Providers, 12 June 2008.

<sup>9</sup> Canadian Advanced Technology Alliance (CATA), 3 July 2008; Interactive Advertising Bureau of Canada (IAB), 3 July 2008.

<sup>10</sup> Google, Inc., 3 July 2008.

<sup>11</sup> Andrew D. Fernandes, University of Western Ontario, 11 June 2008.

<sup>12</sup> Public Interest Advocacy Centre (PIAC) for Consumers' Association of Canada and National Anti-Poverty Organization, 3 July 2008; l'Union des consommateurs, 24 April 2008 and 12 June 2008.

**B. Factual Issues**

7. CAIP respectfully submits that while Bell's actions with respect to its own customers and their ability to access content on the public Internet may be equally egregious such issues are not the subject of this Application. At the root of this Application is GAS, Bell's unilateral modifications thereto and Bell's interference not with its own traffic but that of its competitors.
8. Unfortunately and especially in Bell's Answer, there are many irrelevant and misleading facts propounded by Bell in support of its anti-competitive conduct. By way of reply, CAIP will set out the relevant facts as established on the record. This will explore the following areas:
  - (a) Bell's GAS service, its essential features (such as speed) and the lack of wholesale alternatives to it. Attached as Appendix I to this Reply is CAIP's analysis of the lack of economically and practically viable alternatives to GAS service;
  - (b) DPI, what DPI equipment is capable of and what Bell must program it to do in order to determine that the content or type of information that is contained within a data packet is Peer-to-Peer (P2P);
  - (c) P2P file sharing, the benefits it offers over other protocols and downloadable formats and the many legitimate economic, social and cultural endeavours that are now run on P2P;
  - (d) The effects of P2P on the end-users of competitors, be they Internet access subscribers or consumers of other services and their concerns with Bell's interference with their relationship with their ISP or service provider. Attached as Appendix II to this Reply is a catalogue of the 1316 submissions from individuals filed in support of CAIP's Application;
  - (e) The effect that traffic shaping has on competitors that subscribe to GAS; and

---

<sup>13</sup> British Columbia Civil Liberties Association, 12 June 2008; Advancing Democracy & Media Sanity in Canada, Canadian Internet Policy and Public Interest Clinic for Campaign for Democratic Media, 3 July 2008.

- (f) Bell's successive after-the-fact rationalisations for the deployment of DPI and the throttling back of GAS services and why Bell's measures are neither rationally or causally connected to competitors' traffic and how the facts quite simply contradict Bell's rationalisations. Through a detailed analysis, CAIP de-bunks Bell's congestion claims and their relevance to CAIP's Application.

**C. Grounds for Relief**

- 9. Having addressed these factual issues, CAIP then responds to Bell's arguments with respect to each of the grounds raised by CAIP in support of its Application:
  - (a) Breach of the tariffing requirements of sections 24 and 25 of the *Act*;
  - (b) Breach of the anti-discrimination/disadvantage/preference provisions of subsection 27(2) of the *Act*;
  - (c) Lack of notice of network changes affecting the GAS service;
  - (d) Breach of Bell's common carrier obligations (section 36); and
  - (e) Breach of end-user privacy.
- 10. In addition to the above-noted legal grounds for allowing CAIP's Application, CAIP notes that since it first filed its Application, an unprecedented number of individual Canadians have come forward to support its Application. While many Canadians are unhappy about Bell's changes to its retail Internet access service and have spoken vociferously against those changes, they also understand that what is at stake in this proceeding is the availability of competitive alternatives to the retail telecommunications service offerings of Bell and other ILECs. Bell's throttling of competitor GAS traffic puts into Bell's hands control over the pace and extent of competition in downstream retail markets. Since there are insufficient wholesale alternatives to the last mile access and transport functionality of GAS, a failure to enforce the provisions of the Act and the Commission's long-standing policies could be used by ILECs in myriad situations to shape other forms of competitor traffic under the guise of "traffic management".
- 11. CAIP's Application is well founded in law as well as being consistent with the Canadian telecommunications policy objectives of promoting competition sufficient to protect the interest of end-users and end-users' interests in protecting the privacy of

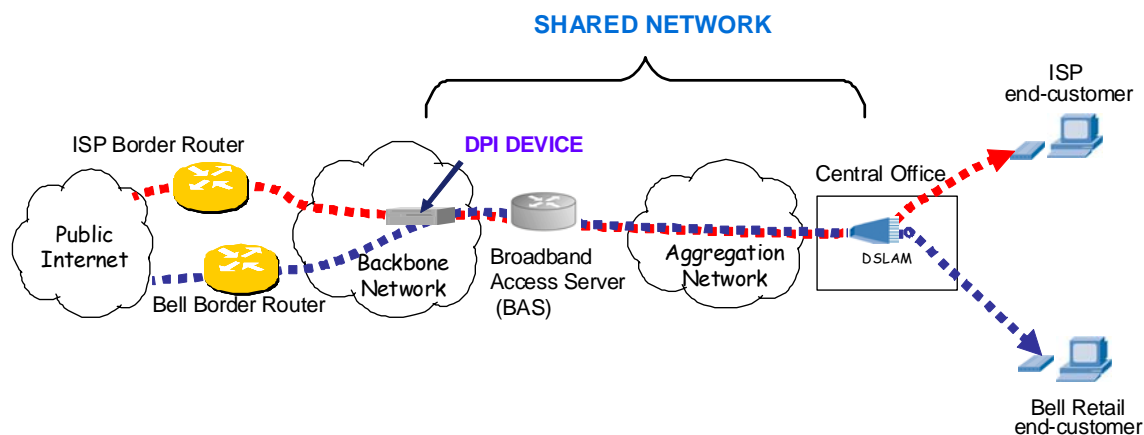
telecommunications. Canadians are waiting and watching the outcome of this proceeding to ensure that instances of anti-competitive conduct are effectively foreclosed by the Commission.

- CAIP notes that it is not possible, in the short amount of time allotted, for CAIP to respond to each and every issue and argument raised by Bell and other interested parties to this proceeding. Where it does not do so, such silence should not be construed as agreement with or acceptance of such issue or argument where it would be contrary to the interests of CAIP and its members to do so.

## II. GAS SERVICE

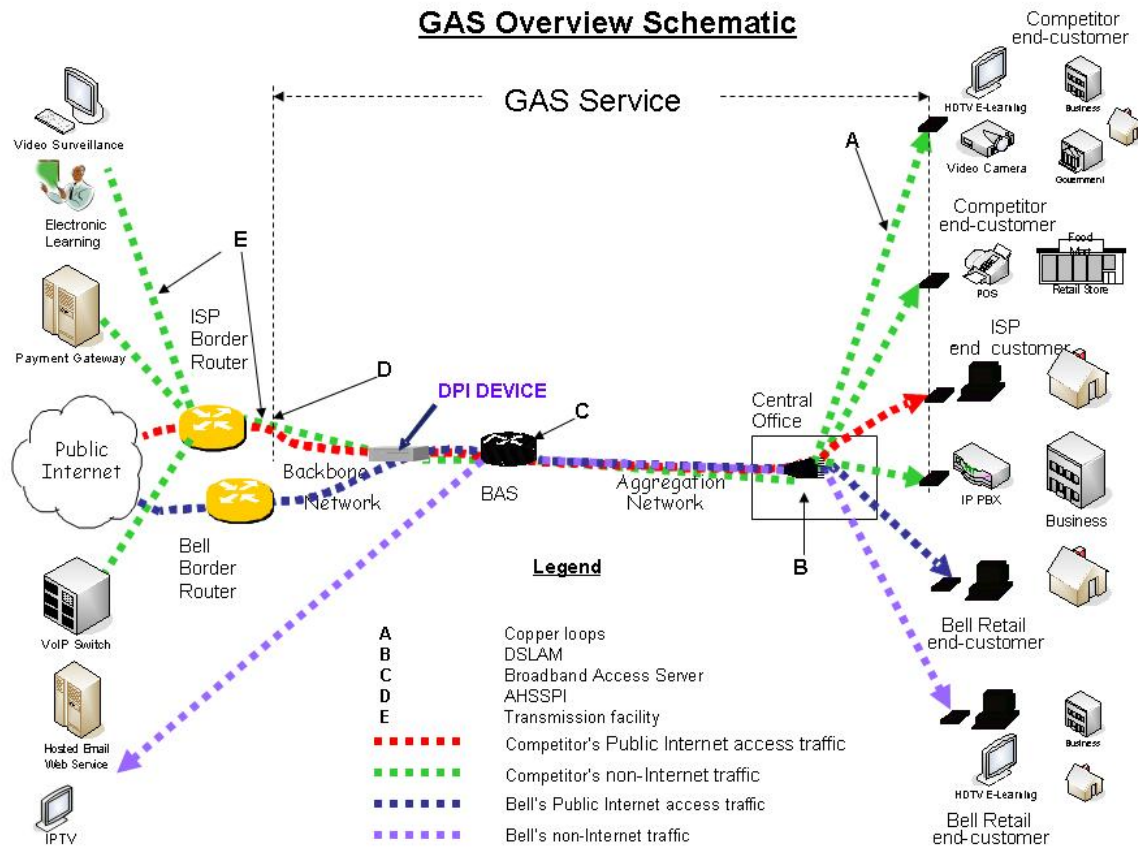
- In its earlier submissions in this proceeding, Bell attempted to portray the GAS service that it sells to competitors as an “internet access” service, and has implied that this service is the same service that it sells to its retail customers. Although Bell has retreated somewhat from this position in its Answer of 7 July 2008, it still insists that GAS is “shared” with its retail Sympatico service and that this somehow justifies its traffic shaping practices. In support of these arguments, Bell offers the following diagram which purports to show how GAS traffic is “shared” with Sympatico traffic.

**Bell Figure 1**



- CAIP has reviewed Bell’s diagram and its descriptions of GAS service and notes that Bell has conveniently omitted to mention several important aspects of the GAS service which make it clear that this service is a standalone, independent service that can be used by competitors to provide a wide variety of retail telecommunications services (*i.e.* not just Internet access services). CAIP has therefore prepared a revised diagram of the GAS service (set out immediately below) and a corresponding description of this service

in order to ensure that the record contains an accurate depiction of all salient features of the service.



15. According to Item 5400.2.(a) of Bell's General Tariff, Gateway Access Service or "GAS" is a broadband access service "based on asynchronous digital subscriber line (ADSL) technology" that allows a service provider "to establish a high speed data access path between its end-user's premises and a Company serving wire centre."<sup>14</sup> GAS uses available bandwidth above the voice-band on the same local loop as the end-user's Bell or CLEC provided residential or business individual line.
16. Importantly, Bell's GAS tariff states that the service "includes logical paths to provide network connectivity between GAS Access arrangements and an ADSL AHSSPI by aggregating traffic associated with each GAS Access served from groups of wire centres

<sup>14</sup> Bell GT Item 5410.2.

to a broadband access server (BAS) and subsequently aggregating such traffic from all Company provided BAS to the ADSL AHSSPI.”<sup>15</sup>

17. In other words, the GAS tariff provides competitors that subscribe to the service with a separate and pre-defined pathway or virtual pipe that runs directly from an end-user's premises all the way to the AHSSPI. These paths are created by the modem equipment located at the end-user's premises as well as by the DSLAM and BAS equipment located within Bell's Central Offices (COs) and local access and transport network respectively.
18. The fact that these paths might run through facilities that Bell uses to provision its own retail Sympatico service is largely irrelevant because the path is pre-defined all the way from the end-user's premises to the AHSSPI, and Bell is prohibited by its status as a common carrier from interfering with or even reviewing the data that travels that path.
19. This is depicted in the GAS Overview Schematic above which illustrates how GAS traffic travels over dedicated and pre-defined paths all the way from the end-user's premises (point "A") to the DSLAM in the CO (point "B") and then on to the BAS and AHSSPI (points "C" and "D" respectively) where competitors physically interconnect with Bell's network.
20. Bell's attempts to characterize GAS as a "shared" service is therefore misleading. There is not one point in this system where the data path is broken or "shared" with other data paths such as those used by Bell's Sympatico service. Indeed, the GAS service would not work if such "sharing" were to occur because the pathway must remain separate and independent from other pathways in order for data packets to make their way from the end-user's premises to the AHSSPI. This is why the tariff uses the term "logical paths" to describe the dedicated connection that is created by the service.
21. It is also important to point out that even though Bell has attempted in this proceeding to characterize GAS as a "shared" service, this is not the message that it is delivering to the public at large. Indeed, in order to distinguish its retail Sympatico services from the cable companies' coaxial cable Internet access services, Bell has repeatedly advertised that users of its Sympatico service do not have to share connections to the Internet like users of the cable companies' retail Internet access services.

---

<sup>15</sup> Bell GT Item 5410.2.(c)(1)a.

22. Another myth regarding Bell's GAS service is that GAS is a wholesale *Internet access* service. As many parties to this proceeding have pointed out, GAS service can be used to provision a wide variety of high speed telecommunications services, including remote LAN access services, Virtual Private Network (VPN) services, streaming audio and video services, dedicated data services and Voice over Internet Protocol (VoIP) services. The multitude of services capable of being provisioned using GAS is depicted on the left-hand side of CAIP's diagram of Bell's GAS service above.
23. While it is true that GAS can also be used to provide Internet access services, it is not Bell that makes this decision or actually provisions this particular service. It is the GAS customer that makes this decision and provisions the service in question. In this regard, CAIP also notes that the erroneous assumption that runs like a thread through Bell's submissions in this proceeding is that ISPs are the only customers of GAS.<sup>16</sup>
24. As noted by CAIP and other parties to this proceeding, GAS is essentially a "layer 2" local access and transport service intended for carriers and other service which supports Point to Point Protocol over Ethernet (PPPoE) communications sessions. In practical terms, what this means is that GAS is basically an opaque pipeline through which all types of packet data services and applications can flow using the PPPoE protocol.
25. Furthermore, it is not Bell but rather its competitors who create these applications and services and who provision these capabilities using their own network and facilities. The competitor accomplishes this by first interconnecting with Bell at the AHSSPI (point "D" in CAIP's GAS Overview Schematic) and then backhauling its end-users' traffic to its own point of presence (point "E") where it can process and route the traffic however it sees fit.
26. Therefore, contrary to Bell's attempts to characterize GAS as a "white label" Internet access service, the truth of the matter is that GAS was designed to provide carriers and other service providers with a basic local access and transport capability over which they could provision their own services. Accordingly, Bell has no right to interfere with the applications and services that are delivered over GAS access facilities by its competitors.

---

<sup>16</sup> *E.g.*, Bell, Final Answer, paragraph 18.

27. In recognition of the important role that GAS plays in the provisioning of retail telecommunications services by competitors, the Commission recently classified this service (as well as all other “aggregated ADSL services” provided by the ILECs) as a conditional mandated non-essential service in *Revised regulatory framework for wholesale services and definition of essential service*, Telecom Decision CRTC 2008-17 (Decision 2008-17). In making this determination, the Commission noted that:

... competitors use aggregated ADSL access and TPIA services to offer retail high-speed Internet access services. They can also use ADSL access service, which has been classified as a conditional essential service above in conjunction with self-supplied transport facilities to offer retail high-speed Internet access service. However, the Commission also notes that the use of self-supplied transport facilities requires that competitors co-locate, typically in multiple central offices.

85. The Commission considers that in many situations, co-location is not a cost-effective alternative for reasonably efficient competitors at this time. In order for competitors to offer retail high-speed Internet access service, in most instances they have no option other than to buy the wholesale aggregated ADSL access or TPIA services. To withdraw mandated access to aggregated ADSL access service – that is, access and transport – at this time would likely result in a substantial lessening or prevention of competition in retail high-speed Internet access services. The Commission therefore finds that aggregated ADSL access service must be mandated, given that it is the only cost-effective means to provide transport to, and access from, an ILEC's central office to the competitor's customer. In order to apply the principle of technological neutrality, the Commission considers that under these circumstances TPIA services should also continue to be mandated.<sup>17</sup>

28. Subsequent to the release of Decision 2008-17, Bell filed a review and vary application with the Commission requesting that it be relieved of the requirement to provide competitors with another type of wholesale ADSL service (called “ADSL Access” or “ADSL-CO” service) because it was unable (and also unwilling) to provide this service on a central office-by-central office basis. This latter service was classified by the Commission in Decision 2008-17 as a conditional mandated essential service.
29. If the Commission grants the relief requested by Bell in its review and vary application, the only wholesale ADSL services that will remain available to competitors are so-called “aggregated ADSL” services, such as Bell Canada's GAS service. In light of this problem and in light of the fact that the only way for competitors to provide ADSL-based services to end-users that are served from remote switches is by using the ILECs'

---

<sup>17</sup> Decision 2008-17, paragraphs 84-85.

aggregated ADSL services, CAIP along with several other parties have asked the Commission to re-classify the ILECs' aggregated ADSL services (including Bell's GAS service) as conditional mandated essential services.

30. Bell is opposed to these requests because it believes that there are competitive alternatives to its GAS service. By way of response, CAIP notes that the record of the proceeding relating to Bell's review and vary application, as well as a separate review and vary application by MTS Allstream make it clear that there really are no feasible or practical alternatives to the ILECs' aggregated ADSL services for reasonably efficient competitors. This includes the cable companies' third party Internet access ("TPIA") which, as demonstrated in Appendix I hereto, is not a realistic or practical alternative to aggregated ADSL services such as Bell's GAS service.
31. To conclude, GAS is a mandated, standalone, and independent service that provides an opaque pipe (opaque to Bell, the carrier), between the end-user's premise all the way to the AHSSPI. It is not a "white-label" Internet access service but rather, can be used by competitors to provide a wide variety of retail telecommunications services (*i.e.* not just Internet access services). As will be discussed in the portion of this Reply dealing with the applicability of sections 24 and 25 of the *Act*, the speed and capacity of the service at both the end-user premises and at the AHSSPI are defined characteristics of the service and are contained in the GAS tariff. Notwithstanding the foregoing, Bell asserts in its Final Answer as it has done for the past four months that it is entitled to inspect the traffic carried over GAS lines and to throttle back the speed of GAS service by as much as 90 per cent.

### **III. TECHNOLOGY**

#### **A. Deep Packet Inspection**

32. DPI, according to industry authorities, is a technology that enables network owners to identify and manage data on their networks according to type and content. The technology operates by inspecting data "packets," which are in some ways analogous to postal mail messages. Whereas most network management technology is designed to

read the data packet header – analogous to the address on a letter - DPI “opens the envelope” and actually inspects the contents or “payload” of the packet.<sup>18</sup>

33. According to Ellacoya Networks (Ellacoya), the provider of Bell’s DPI equipment, deep packet inspection provides “unprecedented visibility into subscriber usage, subscriber-specific service activity and service quality on a per-application basis.”<sup>19</sup> More specifically, Ellacoya claims that its technology “identifies subscribers, classifies and controls applications on a per-subscriber basis, improves performance and customer satisfaction, and delivers revenue-generating IP services.”<sup>20</sup>
34. Bell Canada has stated that it originally purchased DPI devices in order to deploy new usage-based billing programs, which require close monitoring or, in essence, “profiling” of subscriber network usage.<sup>21</sup> At some subsequent point Bell decided to use the data-classifying capabilities of the technology to discriminatorily “shape” traffic on its networks. As used by Bell, then, DPI peers into data packets and scans the content to determine whether it was created by a P2P file-sharing application. If so, the packet is classified as “non-time-sensitive” and delivered at a drastically slower rate.
35. Using DPI for traffic shaping is not a matter of simply installing DPI “boxes” on a network. Having brought online the capability to identify packets by their content, network owners must reprogram pre-existing network equipment to filter the packets identified by DPI in order to selectively control their transfer speed according to particular network management priorities. In the present case, Bell has set its network to impede the transfer of P2P data packets between set hours of the day (*i.e.*, 4:30 p.m. to 2 a.m.).

## **B. P2P Networks**

### *1. What is P2P?*

---

<sup>18</sup> [d]packet.org, “Introduction to Deep Packet Inspection/Processing,” online: <https://www.dpacket.org/introduction-deep-packet-inspection-processing>. This is explained in more detail in Part X herein.

<sup>19</sup> Ellacoya Networks, “Ellacoya brings Unmatched Scale and Intelligence to Broadband Service Optimization” (25 Jan. 2007) online: Ellacoya Networks [http://www.ellacoya.com/news/pdf/2007/Ellacoya\\_e100PressRelease.pdf](http://www.ellacoya.com/news/pdf/2007/Ellacoya_e100PressRelease.pdf)

<sup>20</sup> Ellacoya Networks, “Ellacoya Networks Attracts New Investors in \$13.5M Financing” (18 July 2005) online: <http://www.ellacoya.com/news/pdf/2005/Ellacoya2005Funding.pdf>. See also Nate Anderson, “Throttle me this: An introduction to DPI” (July 2007), online: Ars Technica <<http://arstechnica.com/articles/culture/deep-packet-inspection-meets-net-neutrality.ars>>

<sup>21</sup> Bell Final Answer, 11 July 2008, paragraph 108.

36. P2P generally refers to a system of communication where multiple nodes connect to form a network where each node is both a client and a server. One of the most popular P2P protocols, BitTorrent, enables clients to download files in several “pieces” from multiple nodes simultaneously. This can be contrasted with traditional network architectures where multiple clients connect directly and download content from one central server. One of the greatest benefits of P2P, therefore, the ability to take advantage of otherwise idle upload capacity available to multiple nodes on the network.

2. *P2P Does Not Consume Overwhelmingly*

37. Bell’s initial stated rationale for deploying traffic shaping was to rein in the bandwidth usage of an ill-starred five per cent of internet users who, according to Bell, were ruining it for everyone else. These users, Bell claimed, employ P2P file transfer applications in a manner that consumes a disproportionate amount of bandwidth, creating negative impacts on other users due to congestion on the network.
38. Contrary to Bell’s assertions, the use of P2P applications to transfer content through the Internet does not consume more bandwidth than the use of more traditional client-server architectures. Bell’s assertions in this regard, which echo the rhetoric of DPI equipment manufacturers and TELUS and Rogers, do not fairly represent P2P technology and appear calculated to mislead both the public and the Commission.
39. At paragraph 40 and following of Bell’s Final Answer, Bell purports to explain how a P2P user manages to consume a disproportionate amount of bandwidth. Bell, citing Rogers’ colourful language, states that P2P is “designed to overwhelm other traffic.” Bell goes on to state that a P2P application will open up to 40 to 100 TCP sessions in an effort to transfer data as fast as possible using multiple sources. Bell then reproduces in Figure 4 a diagram of a “pipe” depicting how P2P user A “hogs” a disproportionate amount of bandwidth as compared to non-P2P-user B.<sup>22</sup>
40. Bell fails to mention a number of very important assumptions or facts regarding Figure 4 and how TCP works:
- (a) The reality in relation to the end-user of a GAS customer is that the total amount of bandwidth used by the end-user is limited to the GAS subscription bandwidth

---

<sup>22</sup> Bell, Final Answer, 11 July 2008, paragraph 44.

(e.g., 5 Mbps downstream/800 kbps upstream), regardless of how many sessions the user has open. Thus, the end-user has a real cap on the amount of bandwidth that he or she can upload or download.

Bell's Figure 4 assumes that there is no bandwidth limit at the source or destination of the transmissions.

- (b) In reality, P2P downloads are made from other end-users. In such case, bandwidth is limited at both the source and destination end. On Bell's network, each of these uploading connections for end-users of GAS customers is limited to a maximum of 800kbps. The download connection is also limited by the GAS tariff. Thus where the download connection is for the 5 Mbps GAS service, at the very most, the downloader could sustain, assuming that the uploading connection is operating a full speed, is six connections or sessions.

Bell's Figure 4 implies that a P2P user may download or upload using a limitless number of sessions.

- (c) Bell fails to disclose that in the original diagram prepared by George Ou upon which Figure 4 is based, the large green cutaway pipe represent a *congested* network link.<sup>23</sup>
- (d) Bell fails to disclose that under no circumstances, congested or otherwise can a P2P application take up more bandwidth than that which is defined by the speed at the source and destination of the communication.
- (e) George Ou concedes that for purposes of that diagram, "Downloads don't matter. Downloads aren't congested."<sup>24</sup>

- 41. When there is congestion in the network, the TCP protocol alleviates the congestion by instructing communicating computers to reduce the amount of data entering the network. This is done amongst all connections flowing through the congested portion of the network.

---

<sup>23</sup> George Ou, "Fixing the unfairness of TCP congestion control", 24 March 2008, <http://blog.zdnet.com/Ou/?p=1078&page=2>.

<sup>24</sup> See posts dated 24 March 2008: 1.2 "George made no such illustration", 1.2.1 "You're wrong on several points" and 1.2.1.1 Who writes your articles" at <http://talkback.zdnet.com/5208-10533-0.html?forumID=1&threadID=45883> in relation to the Ou article referred to immediately above.

42. While P2P applications that are being uploaded may take up more bandwidth than non-P2P connections when the connection is *congested* (because the P2P application does not self-constrain itself to the same extent as other TCP-based applications), as stated above, even in this circumstance, the P2P application cannot exceed the bandwidth allocated at the source and destination of the communication by the ISP or in our case the GAS tariff. When there is no congestion, the phenomenon described by George Ou in his diagrams will not be observed. Only once a pipe hits the point of congestion will TCP "stacks" drop packets and force non-P2P connections to reduce the speed of transmission, thus alleviating congestion.
43. With the foregoing clarifications, it should be evident that P2P is not the threat that Bell makes it out to be. Furthermore any bandwidth effects associated with P2P are entirely contingent on whether or not congestion actually exists over a given link. CAIP devotes Part V of this Reply to de-bunking that congestion myth. If the link is not congested then none of Bell's claims regarding P2P's disproportionate use of bandwidth apply. It is necessary to reiterate that through its GAS service, Bell is merely providing competitors with last mile connectivity – an "opaque pipe" between the competitor's point of presence and the household of an end-user. With P2P, a file is downloaded in segments simultaneously from a number of sources. Although a number of transfers may be occurring at the same time, the total volume of traffic going over the last mile is the same whether the file is loaded from or to a source or a number of sources. As such, in terms of traffic, it makes no difference whether content is transferred through P2P or any other protocol. It is misleading to argue that a movie or television program takes up more bandwidth over the last mile because an individual chooses to access that content through P2P.<sup>25</sup>
44. There is therefore no justification for throttling the content of GAS customers simply because some of this content is distributed through P2P applications.
45. Furthermore, while global bandwidth usage is growing exponentially, a recent study by Cisco (cited at p.20 of Bell's Final Answer) predicts that the relative proportion of P2P traffic on the Internet will actually decrease over the next four years.<sup>26</sup> This raises the question – which Bell does not satisfactorily answer – as to why Bell chose to

---

<sup>25</sup> For a more detailed discussion see the submission of Vaxination Informatique, 3 July 2008, paragraphs 14-

17.

<sup>26</sup> Cisco, Global Consumer Internet Traffic 2006-2012, 2008.

discriminate against P2P in its traffic shaping program. CAIP notes that P2P, because of its use by some persons to share copyrighted content, may present a politically-easier target for Bell than other kinds of data.

### 3. P2P has Many Positive Uses

46. In justifying its application of DPI throttling against P2P file transfers by its competitors' end users, Bell has attempted to characterize P2P file sharing as an "unfair" or even rogue mode of transferring data across networks. In particular, Bell implies that P2P is the motive force behind a wave of "bandwidth hungry" applications that will soon overwhelm global networks in the absence of aggressive measures taken against it. It also states that all P2P data transfers should be considered the postal equivalent of "bulk" or "lower urgency" mail, and that such transfers are never "time-sensitive" to the same extent as web browsing and other applications.<sup>27</sup>
47. In response to these misleading representations, CAIP notes that from its early roots as a marginal and even counter-culture method of data distribution, P2P applications, especially BitTorrent, have become fully mainstream, fully commercialized and fully endorsed by a number of major movie studios and content creators. For Bell to characterize BitTorrent as the tool of bandwidth abusers is both short-sighted and manifestly incorrect. For instance, many of the major U.S. media content providers, including Fox, MTV, Paramount and Warner Brothers have endorsed BitTorrent as a method for distributing their offerings.<sup>28</sup>
48. The European Union has also recognized the value of P2P technology and has announced that it will invest €14 million in "P2P-Next", an "open source, efficient, trusted, personalized, user-centric, and participatory television plus media delivery mechanism with social and collaborative connotation using the emerging Peer-to-Peer (P2P) paradigm, which takes into account the existing EU legal framework".<sup>29</sup>
49. A recent survey conducted by the Canadian Internet Policy and Public Interest Clinic (CIPPIC) helps to demonstrate the self-serving nature of Bell's imposition of meaning on P2P. *Hundreds of legal* applications and services in every conceivable area of public

---

<sup>27</sup> Bell Answer, Appendix 1, page 5.

<sup>28</sup> These organizations have consented to the display of their trademarks on BitTorrent's website.

<http://www.bittorrent.com/>

<sup>29</sup> P2P-Next, online: <http://www.p2p-next.org/>.

and private online life utilize P2P transfers.<sup>30</sup> Some of these applications are increasingly important to the cross-pollination of ideas in art, music, politics, business and the technological and sociological development of the internet itself. Others, like the massive files transferred by Dr. Andrew D. Fernandes at the Schulich School of Medicine at the University of Western Ontario, are critical to research in other fields.<sup>31</sup> A catalogue of many of these mainstream uses appears in an Appendix of CIPPIC's submission on behalf of the Campaign for Democratic Media.<sup>32</sup> Included among these uses are the following:

- (a) BitTorrent – the most popular P2P file sharing protocol is used increasingly for the distribution of many types of content, such as:
  - (i) films and music by artists such as Nine Inch Nails,
  - (ii) television programs by the Canadian Broadcasting Corporation (CBC), and
  - (iii) computer software (e.g. Linux operating system) and video games for use on the Sony Playstation 3;
- (b) Television, film and music distribution channels – Numerous distribution channels based on P2P technology have emerged, including: Babelgum, Blinkx BBTv, the British Broadcasting Corporation (BBC)'s iPlayer, GridNetworks, Joost, Livestation, Mashboxx (soon to be released, authorized by major record labels such as Sony BMG Music and EMI Music), Open Media Network, Pando Networks, RedSwoosh, Realtime Rentals, and Tribler Video Streaming,
- (c) Private file sharing – P2P allows users to transfer large files in an efficient and secure manner;
- (d) Privacy protected communications – Allow users who wish to avoid advertising targeted at behaviours, citizen journalists in countries without safe access to

---

<sup>30</sup> <http://p2peducation.pbwiki.com/>. See CIPPIC, 3 July 2008.

<sup>31</sup> See Fernandes, 11 Jun 2008: "My work in bioinformatics and the genetics of human health requires that I regularly use and transfer large amounts of data between home and my two offices. Thanks to Bell's decision to throttle my Internet bandwidth, bandwidth that I do **not** purchase from them, I can no longer utilize my home office when doing research. Bell assumes that any large encrypted file transfers must be illegal music or video sharing, and therefore confuses my cancer-related human genome database with pictures of Paris Hilton or Britney Spears. "

<sup>32</sup> CIPPIC on behalf of the Campaign for Democratic Media, 3 July 2008, Appendix 1. This submission is being kept up to date online at <http://p2peducation.pbwiki.com>.

media, law enforcement establishing anonymous tip lines, activists, and whistleblowers to communicate securely via the Internet;

- (e) Real-time communications (e.g. popular VoIP application, Skype);
- (f) Web search engines, such as YaCy and FAROO;
- (g) Platforms for business collaboration (e.g. Collanos Workplace); and
- (h) Adobe Flash Player – the next version of Flash Player which will enable users to stream audio and video to other peers.

#### IV. DEPLOYMENT OF DEEP PACKET INSPECTION BY BELL CANADA

50. Bell admits that it has been running *technical trials* of DPI equipment on its Sympatico customer base since an unspecified point in time last year. Then, in October 2007, Bell began to apply throttling measures against its Sympatico customers on a commercial basis, reducing the transfer speeds of P2P file transfers and other encrypted traffic to approximately 30 KB/s between the hours of 4:30 p.m. and 2:00 a.m. daily. Concerned by this turn of events, Bell's GAS customers met with Bell on 23 November 2007 and asked Bell directly whether it intended to use DPI on its wholesale ADSL access services. The Bell representatives present at the meeting stated that Bell would only use the technology in conjunction with its retail Sympatico high speed internet service.
51. The reaction from Bell's retail Sympatico customers was felt almost immediately. Indeed, the negative feedback from this community of users expressed in the blogosphere has been intense and growing ever since Bell began throttling its own customers<sup>33</sup>.
52. It is clear from BCE's annual reports that Bell knew full well that if it would lose customers to competitors if it introduced traffic shaping technologies. In its 2007 Annual Report, Bell indicates that it understood that the discontinuance of such unlimited usage plans using DPI as a precursor would likely cause Bell customers to migrate to competitors.<sup>34</sup>

---

<sup>33</sup> <http://www.supportcommunity.sympatico.ca/pe/action/forums/displayinglethread?nesting=0&lastPage=13&currentPage=0&rootPostID=10138051&showPostBody>

<sup>34</sup> In this same Annual Report, Bell noted that certain restrictions that it had placed on customer data transfers as well as a switch to usage-based billing could provide independent ISPs who offer unlimited usage plans or unrestricted speeds, a competitive advantage, "result[ing] in an increase in [Bell's] Internet subscriber churn rate beyond ... current expectations." See BCE, 2007 Annual Report, pg. 42.

53. Given this anticipated response by Bell's retail customers, and notwithstanding its earlier promise to competitors that it would not shape their GAS traffic, Bell began to shape its competitors' GAS traffic on 14 March 2008, without any notice of any kind. Competitors, therefore, had no opportunity to test the impact of Bell's traffic shaping technology on the services that they deliver to their end-user customers. No information was provided to GAS customers as to exactly what changes Bell has made.
54. Beginning on 14 March 2008, CAIP's members were therefore subjected to unexpected network disruptions. As discussed below, the evidence in this proceeding shows that their users were affected without notice. Like Bell's Sympatico customers, its GAS customers did not receive any prior notification from Bell that it intended to introduce traffic shaping measures on their GAS traffic. In fact, not only was no notice given by Bell to these customers, it also failed to provide any details to these customers as to the type of traffic that its DPI boxes would be programmed to detect and throttle. Needless to say, Bell never asked these customers in the period leading up to 14 March 2008 to help develop alternative methods for handling its alleged network congestion issues.
55. After numerous complaints by independent ISPs, Bell belatedly issued a statement on 28 March 2008 confirming that it had unilaterally decided to expand its traffic shaping practices to its wholesale customers.
56. Almost a month later, Bell issued a two-page document entitled "DSL Traffic Management – Frequently Asked Questions (FAQ),"<sup>35</sup> which was not even received by all of CAIP's members who subscribe to Bell's GAS service. Moreover, the document was sent out more than one month after Bell commenced the throttling of its competitors' traffic.
57. From a technical perspective, Bell's FAQ document is almost entirely bereft of any useful information regarding its traffic shaping equipment and network protocols. Moreover, when asked to provide this type of information, Bell has been extremely evasive and short on technical details. Bell's technical support staff appear to have a very superficial knowledge of the DPI equipment in Bell's network, yet they refuse to allow competitors to speak to the equipment vendor directly. In fact, CAIP's members have reported that

---

<sup>35</sup> See "DSL Traffic Management – Frequently Asked Questions (FAQ)", CAIP Application, 3 April 2008, Exhibit C.

Bell will not permit its DPI equipment vendor to troubleshoot or even speak to competitors who have been affected by Bell's throttling practices.

58. Even to this day, Bell has provided virtually no information as to what measures/instructions it has put in place in its routers, switches and other network equipment to affect the type of traffic that its DPI boxes have been programmed to filter and shape. Nor has Bell provided any notice of the rollout schedule for its DPI boxes or the locations in which DPI boxes would be deployed. It has been left entirely up to the carriers and other telecom service providers that interconnect with Bell to determine all of these matters.
59. Competitors require this information in order to properly handle the trouble reports that they receive from their own customers and to figure out, more generally, how best to manage their networks in the face of Bell's traffic shaping measures.
60. In its public comments and its submissions to the Commission, Bell has remained unapologetic and non-conciliatory for the high-handed and abrupt manner in which it instituted this major change to its relationship with its wholesale customers. The company has claimed the right to unilaterally and secretively inspect competitors' GAS traffic as well as to alter a tariffed service mandated by the Commission for specific use by competitors.<sup>36</sup>

#### **A. Impact of Bell's Conduct on its Competitors**

61. The impacts of Bell's conduct on competing ISPs were documented extensively in CAIP's application for interim relief against Bell's throttling.<sup>37</sup> Initial impacts included confusion, disarray, irate customers, additional expenses incurred in dealing with customer complaints, unresolved and unexplained trouble tickets with Bell, and lost accounts where customers abandoned faith in their service provider or claimed that the throttled service rendered their service undesirable.<sup>38</sup>
62. Among the ongoing impacts of Bell's conduct, the most important is that competitor ISPs who purchase GAS from Bell are unable to market or sell product or service offerings that are distinctive from Bell's throttled service. In fact, they are not even able to provide

---

<sup>36</sup> Bell Final Answer, paragraphs 118 and 161.

<sup>37</sup> CAIP Interim Reply, 24 April 2008, pages 24-32.

<sup>38</sup> See also documented loss of customers and goodwill in ACANAC, 3 July 2008.

the quality and quantity of service that their customers had come to expect prior to Bell's interference with their GAS service, resulting in decreased customer satisfaction and loyalty.<sup>39</sup>

63. CAIP members report that Bell's customer service representatives are underinformed and even cagey when asked for assistance, and Bell has refused to allow the manufacturer (Ellacoya) of its DPI equipment to troubleshoot problems with wholesale customers. As a consequence, CAIP's members are no longer able to make accurate predictions regarding customer traffic volumes on their networks, which has reduced their ability to carry out routine network planning and design activities.<sup>40</sup>

#### **B. Effects of Bell's Conduct on End-Customers of GAS**

64. The Commission has received a plethora of evidence from an unprecedented number of individual Canadians describing the effects of Bell's DPI and throttling on their ability to access content on the Internet and on other networks. A number of these comments are summarized and analyzed in CAIP's responses to the Commission's interrogatories, and make it clear that, contrary to Bell's claims in its letter to ISPs on 28 March 2008, many end-users are not experiencing an "increased level of satisfaction."<sup>41</sup>
65. As submissions by interested parties and individuals have shown, a large number of the legitimate and desirable file-sharing applications (P2P and non-P2P) referred to above, most notably those employing BitTorrent, are rendered inutile for 10.5 hours every day by Bell's traffic shaping measures.<sup>42</sup> Throughput is reduced by as much as 90 percent.<sup>43</sup>
66. In addition to the throttling of P2P applications, there is also significant collateral damage to numerous non-P2P applications that are degraded as well. These include, but are not limited to:
- (a) VPN Services: VPN services allow users to work remotely from home. Many interested parties to this proceeding have indicated that their VPN functionality has declined synchronously with the deployment of traffic shaping techniques by

<sup>39</sup> See, e.g. Acanac Inc., 3 July 2008 at para. 12-17.

<sup>40</sup> Primus Telecommunications Canada Inc, 3 July 2008 at para. 23-24; CAIP(CRTC)15May08-5.

<sup>41</sup> CAIP(CRTC)15May08-2 and 15May08-3.

<sup>42</sup> See, e.g. Canadian Internet Policy and Public Interest Clinic for Campaign for Democratic Media, 9 July 2008; Fernandes (University of Western Ontario), 11 June 2008; PerVices Corporation, 2 July 2008; CAIP(CRTC)15May08-2 and 15May08-3; Appendix II herein and CAIP(CRTC)15 May08-2, Appendix A, especially submissions by Dumont, Serge; Herminston, Benjamin PK; Knull, Ron; Timmerman, Kevin; Phommaneth, Michael; Dynes, Walter; and McIntyre, James.

<sup>43</sup> CAIP Application, 3 April 2008, page 24, paragraph 92; Acanac Inc., 3 July 2008, Appendix A.

Bell Canada. Reported symptoms include dramatically reduced response times (slow service), the frequent loss of connections and the inability to connect to workplace VPNs.<sup>44</sup>

- (b) VoIP services: Several parties, including some of CAIP's own members, have performed and submitted test results in this proceeding showing that VoIP calls of end-users who have opened P2P files are degraded both during and after the P2P session is over.<sup>45</sup> These test results are consistent with what at least 12 end-users reported in comments to the CRTC, and with numerous comments on private online forums.
  - (c) Encrypted communications: Wireless Nomad reported that many forms of encrypted communications (including SSH sessions) have been crippled by Bell's traffic shaping practices. This is corroborated by reports in online user groups.<sup>46</sup>
67. Notably, Bell admits that some applications other than P2P may be negatively affected by DPI, and claims to be working with ISPs to mitigate these problems.<sup>47</sup> Characteristically, Bell attempts to paint these matters as trivial when in actual fact many end-users have had to change their work habits and lifestyles directly as a result of Bell's conduct. As for Bell's claims that it is working with ISPs to mitigate these problems, CAIP notes that Bell is in control of how it "labels" its trouble tickets. As a consequence, many trouble tickets relating to its traffic shaping practices have not been labelled as such which means that it has vastly understated the number of DPI-related trouble tickets that it has received and which have been successfully resolved.
68. Although Bell claims that it has been partially successful in mitigating the collateral damage caused by DPI among its Sympatico customers, it has not in any systematic or even-handed way provided its GAS customers with the tools or knowledge to address these issues among its own customers.
69. Notwithstanding Bell's representations that it does not access or use the private information of network users, revelations about the actual function and capabilities of DPI technology raise very real concerns that this technology, in which Bell is a significant

---

<sup>44</sup> See, e.g., CAIP (CRTC)15 May 2008-2, Appendix A, especially submissions by Dynes, Mark; Grego, Filippo; Lopes, Ronald; Primeau, Scott; Deen, A., Ideaca Knowledge Services.

<sup>45</sup> See, e.g., CAIP (CRTC)15 May 2008-2, Appendix A, "Impact on VoIP Services". See also <http://www.dslreports.com/forum/r20343867-Users-of-VoIP>

<sup>46</sup> See, e.g., Wireless Nomad, 22 April 2008; and CAIP (CRTC) 15 May 2008-2 and Appendix II herein, especially submissions by Koblovsky, Jason and Matan, Daniel.

<sup>47</sup> Bell Final Answer, paragraphs 119 and 122: "the vast majority of these problems are not related to the deployment of DPI technology" and "most of these [problem] cases were related to issues with the end-user's DSL line and not DPI".

investor, violates the privacy interests of Canadians. Although Bell has issued contradictory statements about the extent to which DPI currently invades users' privacy, admissions by Bell<sup>48</sup> and statements by DPI manufacturers demonstrate unequivocally that this technology provides Bell with the capacity to undertake electronic eavesdropping.

70. CAIP notes in this regard that Bell has not denied an interest in using the technology in this manner. Indeed, Bell has admitted that the original reason why it purchased traffic shaping equipment was to introduce customer usage data collection functionality (i.e. "profiling") for billing purposes.<sup>49</sup> These concerns have been considered significant enough by CIPPIC to warrant a complaint to the Office of the Privacy Commissioner of Canada. In response, the Privacy Commissioner has held that the privacy issues raised by Bell's use of DPI merit an investigation.

## **V. BELL'S RATIONALIZATIONS FOR ITS DEPLOYMENT OF DISCRIMINATORY TRAFFIC SHAPING MEASURES**

71. The gist of Bell's argument at the beginning of these proceedings was that massive P2P file transfers by a few abusive users were the source of congestion on its shared networks, resulting in poor network performance for the majority of other users. In its Final Answer, Bell has taken the position that P2P applications threaten the viability of the Internet itself, and that only traffic shaping can reverse this fate. In light of these stakes, Bell claims that under its traffic shaping regimes, these "low priority" P2P users are properly relegated to off-peak hours.

### **A. The Alleged Problem of the 5 per cent of Heavy P2P Users**

72. In its initial reply to CAIP's application, Bell Canada stated that prior to its deployment of DPI throttling, "5% of users were generating 60% of total traffic on the network and 60% of that traffic was P2P traffic, including BitTorrent. During peak periods, that same 5% of users were utilizing 33% of available bandwidth. In other words, 95% of Bell subscribers were being negatively impacted by a very small minority of Internet users primarily using P2P file sharing applications."<sup>50</sup>

---

<sup>48</sup> Response to interrogatory, Bell(CRTC) 15May08-7.

<sup>49</sup> Bell(CRTC)15May08-1, page 2.

<sup>50</sup> Bell, Interim Answer, paragraph 20.

73. Interestingly, in its Final Answer, Bell does not make a single reference to its original “5 % of heavy users” argument. Indeed, as several submissions to these proceedings and dozens of comments on online user forums have pointed out, the 5% statement at paragraph 20 of Bell’s Interim Answer becomes self-contradictory and therefore completely meaningless by Bell’s subsequent equivocations in its responses to the Commission’s interrogatories.<sup>51</sup> Furthermore, as Bell later admitted, these numbers, even if relevant, applied only to its Sympatico customers. Consequently, Bell has in effect withdrawn its “5%” statement, thereby invalidating its claims with respect to the ability of the notorious 5% to negatively affect the experience of the vast majority (i.e. the 95%) of remaining users.
74. In addition, as discussed above in the section on P2P traffic, Bell’s claim that P2P is “designed to overwhelm” is unreliable. Bell’s P2P claims are graphically represented at Figure 4 of Bell’s Final Answer, which purports to show the proliferation of TCP sessions that a P2P application will open. However, as noted above, Bell has failed to mention that Figure 4 assumes a completely congested link, applies only to P2P uploads and not downloads, and that in no circumstances can the P2P application exceed the maximum speeds allocated to the line in question by the GAS tariff (or other relevant service).
75. Bell’s final resort as evidenced by its Final Answer is to rely on the exponential growth of the Internet in general to justify its throttling of the P2P and other traffic of end-users subscribing to wholesale GAS customers. Bell devotes a full 35 pages (pp. 11 – 46) with the exception of a few paragraphs specific to P2P applications (paragraphs 40-49), to the “real” reason behind its traffic shaping and its as yet presumably ineffective efforts (through capital investments, usage based pricing and, of course, traffic shaping) to deal with its claimed congested problems.
76. Bell appears to have retreated still further while opening up the broadest front possible, in claiming that it is entitled to deliberately throttle the speed of competitor services by virtue of its status as a Canadian carrier.

---

<sup>51</sup> Once all of the “clarifications” contained in Bell(CRTC)15May08-1 CAIP Part VII are incorporated into the language at paragraph 20 of Bell’s Interim Answer, it would read as follows (modifications shown in blackline): Last fall, before the Company began deployment of its Internet traffic management solution to ease network congestion during peak usage periods, 5 % of Sympatico retail high-speed Internet users were generating 60 % of total **Sympatico retail high-speed** Internet traffic in areas where DPI devices had been rolled out and 60% of that traffic was P2P traffic, including BitTorrent. During peak periods, that same 5 % of users were generating 33 % of the total sympatico retail high-speed Internet traffic that transits through the DPI devices.

77. Whether or not one gives Bell the benefit of the doubt regarding the reason behind its varying storylines, Bell's rationalisations require that it establish persuasive and serious congestion in its network (since that is how it has chosen to throttle its competitors' traffic) and a causal link between such congestion and its competitors' traffic.
78. In the remainder of this section, CAIP parses Bell's claim that congestion in its network justifies the throttling of GAS customer traffic. As discussed below, Bell has provided no compelling or even substantive evidence to demonstrate that it is suffering from congestion problems in the various portions of its network that carry GAS customer traffic. In fact, even from the incomplete and redacted descriptions that have been provided by Bell, it is clear that:
- (a) Bell uses a flawed methodology for determining network congestion which is not based on any measurements of actual congestion in its network;
  - (b) Bell has an enormous surplus of capacity in its network, including that portion of its network which Bell claims is the most congested;
  - (c) Despite Bell's assertion that congestion is a problem that exists throughout the shared portion of its network,<sup>52</sup> CAIP's members did not experience any of the effects of such congestion, such as dropped packets and latency, in any period of time prior to the introduction of traffic shaping measures by Bell. Other parties to this proceeding who subscribe to Bell's GAS service, such as Primus, Distributel and Acanac, also report that they did not experience any of the effects of network congestion prior to the introduction of traffic shaping measures by Bell; and
  - (d) Bell has offered no documentary evidence that supports its oft-repeated claim that its traffic shaping practices are justified because they improve the experience of all users on its network. In actual fact, Bell's traffic shaping practices have diminished the experience for a large proportion of users, just so that Bell can free up bandwidth for its Bellvideostore.ca service and its 7 Mbps and 16 Mbps retail Internet access services.

---

<sup>52</sup> Bell Final Answer, paragraph 17.

79. Not only has Bell failed to provide any general or overall evidence of congestion in its network, it has also failed to produce any specific evidence showing that wholesale GAS customers in particular are the cause of its so-called congestion problems. As many parties have pointed out, Bell's "evidence" of congestion in this proceeding appears to be based entirely on network usage by its retail Sympatico service, a service which is completely different than the wholesale GAS service that is used by competitors to provision their own high speed services. CAIP is not aware of any instance where the Commission has allowed an ILEC to deliberately degrade and impede the performance of a competitor service without first providing clear and unequivocal evidence that a competitor is abusing the service.

**B. Bell's Methodology for Measuring Link Congestion is Flawed**

80. Bell claims that the principal criterion that it uses for determining where and how much congestion is occurring is the level of utilization of links in the network. It states that there is a close relationship between high utilization levels and high latency on the network, which in turn is indicative of congestion.<sup>53</sup> In paragraphs 71 and 72 of its Final Answer, Bell Canada describes the methodology by which it determines whether a link is congested. Specifically, Bell assigns a threshold limit depending on the circuit type, which is determined experimentally by measuring end-to-end latency, presumably including queuing delay on the ingress. A circuit is considered by Bell to be congested if a link's utilization has exceeded the circuit-specific threshold limit at least once on five or more different days of a consecutive 14-day period. Industry analyst David Burnstein explains this as follows: if five out of 1300+ readings taken every 15 minutes over 2 weeks are within 10-30% of peak traffic loads, the circuit is called "congested."<sup>54</sup>
81. It is important to note that when a circuit is considered "congested" by Bell, this does not mean that: (i) the circuit was actually overloaded, (ii) it reached its full capacity, or (iii) that it has started dropping data in large quantities. It only means that it might be at increased risk of delaying or dropping some percentage of data packets.

---

<sup>53</sup> Bell Final Answer, paragraph 70.

<sup>54</sup> David Burnstein, *Bell Canada: Minimal Congestion, Easily Solved*, DSL Prime, 28 June 2008, cited in Nate Anderson, "Deep Packet Inspection meets 'Net neutrality, CALEA,'" (July 2007), online: <http://arstechnica.com/articles/culture/deep-packet-inspection-meets-net- neutrality.ars>.

82. Bell makes the undocumented assertion that its technique for measuring congestion is a commonly-accepted way of identifying congestion in networks and is "used by many other service providers throughout North America and the UK".<sup>55</sup>
83. By way of response, CAIP notes that this methodology may be useful for network *provisioning* purposes in order to estimate when a particular circuit ought to be *upgraded*. Indeed, delays in installing new hardware or circuits in order to maintain network performance are best avoided by early and proactive estimation of future congestion. However, Bell asserts, without any supporting evidence, that this methodology is also suitable to identify conditions of actual congestion that can degrade service.<sup>56</sup>
84. CAIP and other interested parties have considered this argument and are not aware of any other network provider that uses this methodology to measure *actual congestion* in its network.<sup>57</sup> As noted above, this methodology is used principally for network planning and provisioning purposes.
85. However, even if Bell's methodology could be used to determine network congestion, there are several problems with the methodology itself, including the following:
- (a) The link threshold limits described by Bell in its Answer<sup>58</sup> are extremely conservative. In fact, it is possible to run DS3 or OC3 circuits in excess of the percentages referenced in Bell's Answer without causing service degradation for end-users. The methodology used by Bell determines threshold limits on the basis of latency, but in fact the majority of Internet traffic (using TCP, including popular P2P protocols) reacts sympathetically to increased path latency long before there is any risk of packet loss.
  - (b) Bell Canada considers link utilization measurements. These measurements are made infrequently but designate a circuit as congested even if only a very small number of those measurements indicate traffic levels above threshold limits. This is not an effective way to measure utilization of a link, since it ignores the general

---

<sup>55</sup> Bell Final Answer, paragraph 73.

<sup>56</sup> *Ibid.*

<sup>57</sup> CAIP also consulted with a leading member of the North American Network Operator's Group (NANOG), for an opinion on this point. Please also see <http://www.nanog.org/> for more information on this organization.

<sup>58</sup> Bell Final Answer, paragraph 71.

traffic profile and instead focuses all of its attention on the presence or absence of (potentially) a very small number of traffic spikes. Traffic spikes on circuits in response to flash crowds or other short-term phenomena are routine occurrences on data networks.<sup>59</sup> Thus, a circuit may experience spikes of traffic from time to time and still be reasonably considered uncongested.

86. It is apparent from the foregoing that the methodology and thresholds employed by Bell are at significant risk of generating “false positives” by designating circuits as “congested” when in fact they have additional spare capacity which, if used, would cause little or no disruption to customer traffic. This further suggests that the data provided in Bell’s Figure 11<sup>60</sup> is overstated and that the reported monthly fluctuations in the percentage of “congested” links are well within the margin of error for Bell’s measurement techniques.
87. This conclusion is supported by some of the other information that was provided on the record of this proceeding. In fact, Bell’s own evidence indicates that its overall network capacity is increasing apace with the “huge growth in demand”<sup>61</sup> in network usage and that it has an enormous surplus of capacity that is more than adequate to deal with the traffic volumes of its own customers as well as that of competitors. In order to illustrate this point, CAIP has provided a graph below which compares Bell’s annual network traffic to its annual network capacity by network segment.<sup>62</sup> This graph was prepared using the data provided by Bell in Figures 7 and 14 of its Answer which was presented using two different and very misleading scales. Having re-scaled this data, it would appear that if Bell’s figures are accepted, the company’s claims regarding its huge investments in capacity are true. The enormous surpluses in capacity speak for themselves.

---

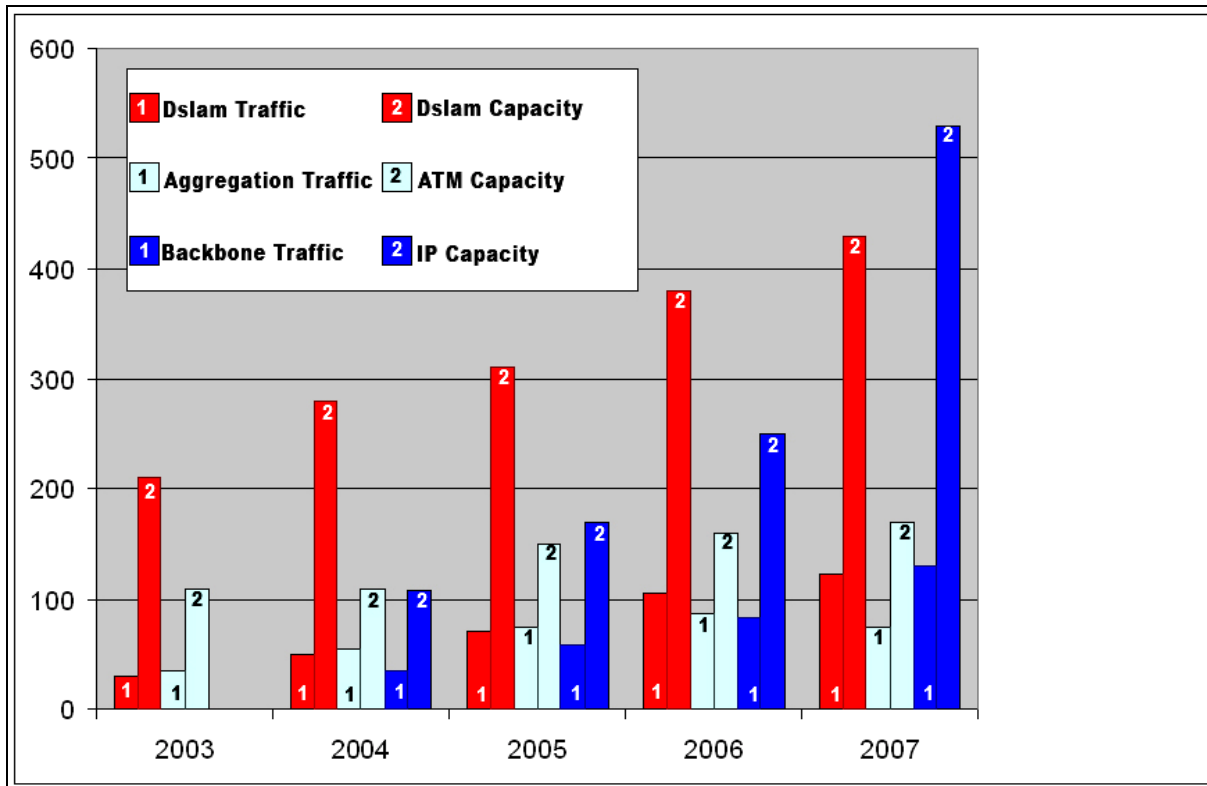
<sup>59</sup> One example is the so-called “Slashdot effect” wherein a popular hyperlink on a popular news site results in a surge of traffic to or downloads from the linked site, sometimes overwhelming its resources. See [http://en.wikipedia.org/wiki/Slashdot\\_effect](http://en.wikipedia.org/wiki/Slashdot_effect) and <http://en.wikipedia.org/wiki/Image:SlashdotEffectGraph.svg>

<sup>60</sup> Bell Final Answer, paragraph 75.

<sup>61</sup> Bell Final Answer, paragraph 61.

<sup>62</sup> Bell Final Answer, pages 24 and 35.

**Comparison of Network Traffic with Network Capacity**



88. Broken down further, these numbers illustrate that traffic in the "aggregation" portion of Bell's network actually *decreased* from 2006-2007, while the capacity in this network increased. Bell has identified the "aggregation" network as suffering from the most significant congestion. Again, if Bell's claims about aggregation network traffic and capacity are correct, it seems that its methodology for identifying congested circuits is flawed, and that its assertions about the need for traffic control in reaction to that perceived congestion are highly suspect.

**C. Cell Loss Statistics Do Not Prove that Congestion Exists**

89. In its Answer, Bell states that it also measures congestion by collecting cell loss statistics from its ATM network. Cell loss events occur when there is a delay in delivering data packets due to heavy traffic or diminished capacity in the network. Bell's Figure 12<sup>63</sup> shows a peak packet loss of 4500 data cells per day across its network in Feb-March 2008, which represents somewhat of a spike when compared to the pattern reported for the previous 6 years.

<sup>63</sup> Bell Final Answer, paragraph 82.

90. These packet loss figures must be disentangled from Bell's convoluted commentary and put into perspective. First of all, it is not clear what ATM cells have been included in this figure. Bell's ATM network presumably carries more than just GAS and Sympatico traffic; however, the ATM cell loss figure does not distinguish between different types of traffic.
91. Second, Bell claims that cell loss events are registered when an ATM port experiences even a single discard due to congestion. This statement must be placed into context. Bell's network transmits *trillions of data packets per day* to hundreds of thousands of end users. CAIP notes that the percentage of lost data recorded by Bell is therefore infinitesimally small. Furthermore, Bell provides not an iota of evidence that this level of packet loss results in "impacts to the customer experience" as it claims in its response to the Commission's interrogatories.<sup>64</sup> Indeed, third party commentators suggest that such losses would be unnoticeable to the end user.<sup>65</sup>
92. Third, Bell's chart of cell loss events shows that these losses rose dramatically and then spiked between October 2007 and March 2008, precisely when Bell rolled out its retail throttling and wholesale GAS throttling, respectively. Prior to that period, packet loss appeared to be increasing incrementally in line with Bell's reported increases in total network traffic *and* network capacity over the same period. It strains credulity to assert that the dramatic spikes apparently registered in this period are solely or even primarily the result of surging P2P or other traffic. However, Bell insists that the only valid explanation is that "abusive" P2P users (the much-maligned 5%), are overwhelming the network.
93. By way of response, CAIP notes that the use of DPI equipment to shape traffic represents an active process that operates in real time to intercept, classify, and redirect data. It is more than likely, therefore, that this equipment, especially in its early roll-out stages could create cell loss events over the course of the billions or trillions of data inspections that it carries out daily. In fact, according to the information that Bell provided at paragraph 75 of its Final Answer, congestion at the DSLAM increased *after* the rollout of traffic shaping in October 2007 and February/March 2008. In fact, even after the full

---

<sup>64</sup> Bell(CRTC)15May08-4 CAIP Part VII, page 5.

<sup>65</sup> David Burnstein, *Bell Canada: Minimal Congestion, Easily Solved*, DSL Prime, 28 June 2008, cited in Nate Anderson, "Deep Packet Inspection meets 'Net neutrality, CALEA,'" (July 2007), online: <http://arstechnica.com/articles/culture/deep-packet-inspection-meets-net- neutrality.ars>.

deployment of DPI in May 2008, congestion at the DSLAM was still higher (allegedly at 5.2%) than throughout most of 2007.

94. One way or the other, CAIP submits that Bell has provided insufficient information to render the ATM cell loss statistics relevant to the questions posed by the CRTC, and it would be a mistake to draw any conclusions about the necessity for traffic shaping from these statistics.

**D. Bell Has Offered No Relevant Data Supporting Its “Customer Experience” Arguments**

95. Bell estimates that without network management “over 790,000 end-users could be affected by highly congested links”<sup>66</sup> and that wholesale GAS end-users are similarly affected. Bell provides no evidence for this estimate. To the contrary, it states that “the Company does not currently have a definite methodology to track GAS customer complaints and correlate them to congestion in the network,” a surprising admission since it indicates that even if its customers *were* experiencing poor network performance, the company would not know about it.<sup>67</sup>
96. Unsurprisingly, then, Bell has not offered any documentary evidence that “customer experience” has been negatively impacted by the congestion that it claims is rampant on its network. In several places in its submissions it asserts that slower internet speeds or failed connections *may* occur. These claims must be placed in the context of the many other factors that *may* cause slow or failed connections on the network. Given the non-existence of any study by Bell correlating customer complaints to congestion, Bell’s entire “customer experience” argument is at best speculative and at worst cynical.
97. This failure to provide evidence of negative impacts is in spite of the Commission’s request that Bell provide an explanation of its claim that the network use by 5% of end-users is negatively affecting the remaining 95%. Bell apparently refused or was unable to answer this question.

---

<sup>66</sup> Bell Final Answer, paragraph 81

<sup>67</sup> Bell Canada (CRTC) 15May08-4 CAIP Part VII, page 6. Note that Bell contradicts itself in its Final Answer at para 99, referring (again without supporting evidence) to “internal testing and some customer surveys” that supposedly establish the fact that the alleged congestion impacts its own end-users.

98. In its Final Answer, Bell recommends to CAIP that it perform tests in the homes of end-user customers so as to derive “fact-based results” with respect to the negative effects of traffic shaping on the end user’s experience.<sup>68</sup> Amazingly, Bell does not report having undertaken any similar testing of its own prior to rolling out its traffic shaping program.
99. More to the point, however, CAIP has provided on the public record of this proceeding the very evidence that Bell has suggested that CAIP gather. In particular, had Bell reviewed CAIP’s response to CAIP(CRTC)15May08-1 Revised, it would see that several of CAIP’s members have tested the transfer speeds of Bell’s GAS service using widely-available network diagnostic software. These tests confirm that Bell’s traffic shaping measures have degraded data transfer rates to as low as 30 kilobytes per second (“KBps” or “KB/s”) downstream for certain types of data traffic.
100. CAIP also noted in this interrogatory that even though Bell claims to apply its traffic shaping measures uniformly across all customers, and has even confirmed in user fora that it throttles end-user transfer rates to 30 KB/s, the comments of end-users in this proceeding and elsewhere indicate that Bell’s throttling measures are not always experienced on a consistent basis across geographical regions, nor is the 30 KB/s limit always applied. Some end users report peak-hour limits of 60 or even 100 KB/s.
101. Clearly, Bell can undertake traffic shaping where, when and how it chooses. However, it is fair to say that that, in general, for up to 10 hours a day, every single day, customers using applications or accessing content that are targeted (either intentionally or collaterally) by Bell’s traffic shaping measures are substantially restricted from enjoying the full benefit of the service for which they have contracted.
102. What is also clear, as the numerous and detailed complaints by end-users in this proceeding demonstrate, is that the precipitous drop in data transfer speeds during so called “peak hours” does not, as Bell has claimed in this proceeding, “enhance the online customer experience and improve Internet performance for all our customers”. As discussed in CAIP’s responses to CAIP(CRTC)15May08-2 and CAIP(CRTC)15May08-3, the experience of end-users has been significantly degraded to the point where some people who depend on unthrottled access to the Internet have literally had to alter their

---

<sup>68</sup> Bell Final Answer, paragraph 126.

work habits and lifestyles as result of Bell's throttling practices. Others have terminated their service altogether.

**E. Proof Positive That There Is In Fact No Pressing Congestion Problem in Bell's Network Warranting the Extraordinary Measures Undertaken by Bell**

103. Despite its claims that congestion on its networks is a significant factor in reducing network utility, and despite its claims that traffic is always on the verge of overflowing capacity, Bell has recently rolled out new higher-speed services for Sympatico customers, promising peak speeds of 7mbps and 16mbps for premium subscribers.<sup>69</sup> These advertised speeds are currently only available on Bell's Sympatico network and cannot be purchased by Bell's wholesale customers.
104. Bell states that it deployed traffic shaping against its wholesale customers in part because "it would not be in the public interest to allow the end users of wholesale ISP customers to continue to use the freed up bandwidth resulting from the deployment of the Company's traffic management DPI solution to its retail and business customer base."<sup>70</sup>
105. This is a highly misleading comment. The truth of the matter is that it would not be in *Bell's* best interest to allow wholesale customers to use this freed-up bandwidth because Bell clearly intends to use it to offer premium services like its 16mbps package and its online Bellvideostore.ca service. Furthermore, as noted in CAIP's Application, it was not because of any "public interest" reasons that Bell decided to throttle its competitors' GAS traffic. Bell took this step for purely competitive reasons. It is clear from BCE's annual reports that Bell knew full well that it would lose customers to competitors if it introduced traffic shaping technologies. In order to stem the flow of this migration, Bell decided to throttle the traffic of its GAS customers, thereby eliminating their ability to distinguish their retail services from those of Bell.

**F. Bell Has Provided No Evidence that Competitors Cause Congestion**

106. All of the reams of Bell's evidence relating to its successive justifications relates primarily or solely to its Sympatico users, to non-P2P traffic, to global Internet traffic growth, and is therefore, mostly irrelevant.

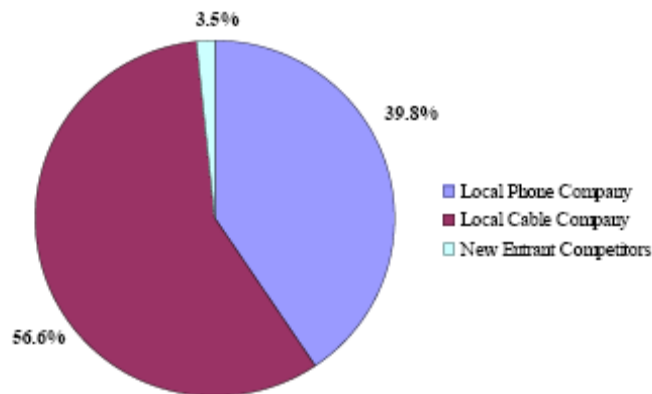
---

<sup>69</sup> [http://www.bell.ca/shopping/PrsShpInt\\_Access.page?userType=EXISTING](http://www.bell.ca/shopping/PrsShpInt_Access.page?userType=EXISTING)

<sup>70</sup> Bell Final Answer, page 19.

107. Independent ISPs make up a tiny proportion of the overall retail Internet access market. According to the Commission's most recent Telecommunications Monitoring Report, issued in July of 2007, independent ISPs accounted for only 6.7% of the revenues generated in the retail market for residential Internet access services in 2006 (down from 8.4% the year before and 10.4% the year before that)<sup>71</sup> and only 3.5% of the revenues for broadband Internet access services in the same year.<sup>72</sup> This is a significant decrease from the 64% market share that independent ISPs held in Canada in 1997.
108. While the 2008 Monitoring Report is yet to be released, Bell reported earlier this year that it served over 2 million high speed customers as of the end of 2007; an increase of 6.8% from the end of 2006, and over 16% from the end of 2005.<sup>73</sup> Bell's market share of high speed Internet subscribers only continues to grow.<sup>74</sup>

#### High Speed Residential Internet Access Revenues by Type of TSP in 2006



109. As such, there is no rational connection between the shaping of traffic belonging to the end-users of GAS customers, who together, account for a tiny proportion of users on Bell's local access and transport networks, and any alleged congestion problems which are a global pervasive problem.

<sup>71</sup> CRTC, Telecommunications Monitoring Report, Table 4.4.5.

<sup>72</sup> *Ibid*, Table 4.4.6. In this regard, Figure 17 of Bell's Final Answer must be read with extreme caution.; Figure 17 purports to show the robustness of customers who compete by way of GAS. It would appear that Figure 17 customers added per month but that it does not show the total of GAS customers in service per month. Thus, to the limited extent that the it is even relevant, CAIP submits that Figure 17 does not show churn and the net change and is therefore not very meaningful.

<sup>73</sup> Bell Canada Enterprises 2007 Annual Report , pages 6 and 8.

<sup>74</sup> These reported data cast in some doubt Bell's statement in its Final Answer, to the extent that it is relevant, that Internet traffic growth on Bell's network cannot be attributed to Bell Canada subscriber growth: Bell Final Answer, page 24.

110. Not only has Bell failed to provide any general or overall evidence of congestion in its network, it has failed to produce any specific evidence showing that wholesale GAS customers in particular are the cause of its so-called congestion problems. CAIP is not aware of any instance where the Commission has allowed an ILEC to deliberately degrade and impede the performance of a competitor service without first providing clear and unequivocal evidence that a competitor is abusing the service.

**G. DPI is an Inappropriate Solution to Congestion Problems**

111. A larger problem with Bell's so-called evidence of congestion is its response to what Bell characterizes as "congestion conditions".
112. CAIP notes that the principal reason to reduce congestion on a network is to reduce disruption of customer traffic (e.g. packet loss or other effects which lead to slowed, stalled or failed sessions between hosts). Ironically, Bell has chosen a method of congestion reduction which by definition is *more* disruptive to some users and is of questionable value in reducing congestion.
113. Despite Bell's claims to the contrary, the primary mechanism for mitigating congestion – industry-wide – is to upgrade circuits in order to provide increased capacity. Circuit bundles with aggregate point-to-point capacities of 10-80Gbit/s (10,000 - 80,000 Mbit/s) are by no means uncommon in Europe, Asia and North America. Indeed, Bell's submissions in this proceeding indicate that at least one of its wholesale customers has backbone and aggregation networks operating at 10 Gbit/s.
114. By way of contrast, Bell states that it measures congestion on circuits as small as 45Mbit/s (DS3), and has applied its traffic shaping measures to alleviate alleged congestion on what is likely to be a very small number of outdated circuits apparently without any immediate intention to upgrade them. While congestion mitigation techniques such as Weighted Random Early Discard (WRED) are certainly used by the industry as short-term measures prior to circuit upgrades, they are not acceptable alternatives to building capacity. The goal of a responsible service provider is to *avoid* disruption of customer traffic, not to actively cause it in order to avoid or delay circuit upgrades.

115. Bell claims that it has spent hundreds of millions of dollars upgrading its network to increase capacity, and states that increased capacity must proceed along with traffic shaping in order to be successful. Without a breakdown of this spending, however, interested parties are left to wonder how much of this expenditure was actually made to license and install DPI boxes<sup>75</sup> which, Bell essentially admits,<sup>76</sup> are an under-tested response to congestion.
116. Interestingly, Bell describes the build-out of a separate DSL/aggregation network using "FTTN" and Optical Ethernet which is characterized as not suffering from the congestion problems Bell alleges on the ATM aggregation network.<sup>77</sup> Bell describes an inability to upgrade its ATM network (which serves the majority of its retail and wholesale customers) for reasons of cost whilst simultaneously describing ongoing efforts to build out an entirely new, higher-capacity network. Since it appears from earlier commentary that Bell's ATM network is not currently operating anywhere near the edge of available link technology, these two comments seem in conflict. CAIP respectfully submits that the Commission should hold Bell to account for these inconsistencies before accepting that throttling is a necessary approach to alleged congestion. If, as Bell's submissions imply, traffic shaping is merely a temporary measure designed to manage network capacity until new capacity comes online, Bell should state this and provide more information on where and when platform and circuit upgrades will be made and discriminatory throttling will end.
117. Furthermore, Bell concedes that much of the bandwidth it has freed up by throttling P2P has been recaptured by users of other applications. This further suggests that discriminatory traffic shaping is not a solution to the problem of congestion and increasing demands on networks. In fact, it merely underscores the real reasons why Bell decided to throttle GAS customer traffic.

---

<sup>75</sup> BCE Inc. has invested millions of dollars directly in Ellacoya Networks, the company that provides its DPI technology.

<sup>76</sup> At paras. 119 and 122 of its Final Answer, Bell admits that despite the fact that its DPI equipment targets P2P, at least some complaints by users regarding other affected services and applications cannot be explained by anything other than DPI. In addition, at paragraph 110 of its Final Answer, Bell states that "the analysis of traffic trends for the purposes of drawing full conclusions on the impacts of the implementation is difficult, especially given seasonal traffic fluctuations [etc.]... A full year of data are needed to understand the impacts of DPI on network traffic." These statements strongly suggest that Bell's use of DPI equipment as a means of addressing network congestion problems has not been properly tested nor, for that matter, is it well understood.

<sup>77</sup> Bell Final Answer, paragraph 95

118. CAIP's position is further supported by the experience of Comcast, a large cable distribution undertaking ISP, in the United States. Recently, three separate complaints regarding Comcast's traffic shaping practices were filed with the Federal Communications Commission (FCC). While the FCC has yet to rule on the complaints, the Chairman of the FCC, Kevin Martin, has announced his intention to recommend enforcement action against Comcast. This recommendation is expected to be put to vote on August 1, 2008.<sup>78</sup> Notably, Mr. Martin has critiqued Comcast's "blunt means" of reducing peer-to-peer traffic:

Contrary to some claims, it does not appear that this technique was used only to occasionally delay traffic at particular nodes suffering from network congestion at that time. Indeed, based on past testimony we have reviewed thus far, this equipment is typically deployed over a wider geographic or system area and would therefore have impacted numerous nodes within a system simultaneously. Moreover, the equipment apparently used does not appear to have the ability to know when an individual cable segment is congested. It appear that this equipment blocks the uploads of at least a large portion of subscribers in that part of the network, regardless of the actual levels of congestion at that particular time.<sup>79</sup>

119. CAIP further submits that if Bell alone among the ILECs has a congestion problem so dire that it is driven to clamp down on certain kinds of traffic, the Commission must consider whether this is explained by poor or inefficient network planning, engineering and service design. Why is no other ILEC throttling either its wholesale or retail ADSL customers if the root cause of Bell's traffic shaping is indeed a global, pervasive problem? If the problem or issue at the root of Bell's traffic shaping measures is the growth of Internet traffic as a whole, then the fact that Bell alone among ILECs is traffic shaping to address it, would suggest that Bell was incompetent in not foreseeing the growth that every ILEC seems to have provided for, or that Bell's own network engineering and service design are not adequate to meet the challenge.
120. In view of Bell's current explanation for why it has engaged in traffic shaping (unforeseen traffic growth and congestion) the Commission is also entitled to draw an adverse inference from the fact that in Bell's internal memo there is not a single mention or

---

<sup>78</sup> See John Dunbar, "FCC chief says Comcast violated Internet rules", *Associated Press* (July 10, 2008), online: <http://ap.google.com/article/ALeqM5huAOgy6g1S5wW-7ft0FRulypdzLQD91RD0RO0>.

<sup>79</sup> United States Committee on Commerce, Science and Transportation, *Opening Remarks by Kevin J. Martin, Chairman, FCC* (April 22, 2008), online: <http://commerce.senate.gov/public/ files/KevinMartinFutureoftheInternetTestimony.pdf>

suggestion that congestion is the reason behind Bell's decision to move its Sympatico customers to usage-based billing.

121. There are alternatives that exist which are far less discriminatory, intrusive, and disruptive to end-users. The fact that Bell alone among ILECs is throttling is persuasive evidence that there are viable alternatives to throttling available to a reasonably efficient ILEC. Some of these alternatives include the following:

- (a) Throttling only when and where congestion actually occurs in Bell's network and, in these specific instances, all packet data traffic should be the subject of traffic management measures as opposed to just P2P traffic originating to/from the Internet;
- (b) Collaborating with protocol/application developers to design P2P and other applications that manage traffic more efficiently and less intrusively;
- (c) Caching popular P2P files (Oversi Inc. is developing a system for this); and
- (d) Educating and empowering end-users to limit demand in peak periods by providing them with software tools to manage down/uploading.

**VI. BELL'S THROTTLING OF COMPETITOR TRAFFIC IS CONTRARY TO SECTIONS 24 AND 25 OF THE TELECOMMUNICATIONS ACT**

122. As noted above, in its 3 April 2008 Application, CAIP requested mandatory orders directing "Bell to "comply with the terms and conditions of its wholesale ADSL tariffs", an order that Bell not deviate from the terms and conditions of its approved wholesale ADSL tariffs without prior Commission approval of any such changes" as well as a declaration "that Bell has acted unlawfully and in a manner that is contrary to tariffs approved by the Commission."

123. These requests for relief are based on the grounds that Bell's decision to unilaterally apply traffic shaping measures to GAS is contrary to sections 24 and 25(1) of the Act. These sections of the Act provide as follows:

**24.** The offering and provision of any telecommunications service by a Canadian carrier are subject to any conditions imposed by the Commission or included in a tariff approved by the Commission.

**25.** (1) No Canadian carrier shall provide a telecommunications service except in accordance with a tariff filed with and approved by the Commission that specifies the rate or the maximum or minimum rate, or both, to be charged for the service.

124. Having reviewed Bell's Final Answer and, in particular, its arguments relating to sections 24 and 25(1) of the Act, it is now clear more than ever that Bell has violated these provisions of the Act.
125. Bell cannot deny that it has systematically and unilaterally and throughout its entire network modified the speed of a tariffed service being offered to competitors. It is doing so not on an ad hoc or "where problems are detected" basis, but rather in all locations where GAS is provided for over 10.5 hours per day. As explained above, the Commission has already found that the speed or throughput of GAS service is an intrinsic and fundamental characteristic of this particular service. Thus, unless the Commission approves of a tariff application to modify the GAS service, which it has not done, Bell has contravened sections 24 and 25(1) of the Act.
126. Bell does not deny the foregoing facts. Instead, in its Final Answer, Bell defensively argues that the measures that it has systematically implemented throughout its network on all residential GAS arrangements for over 10.5 hours a day falls within the speed definitions (such as 5 Mbps in the case of GAS) provided for in the GAS tariff.<sup>80</sup> In the alternative, Bell argues that its Terms of Service as well as contracts that it has purportedly entered into with GAS customers contain provisions that allow it to take steps to ensure that users make fair and proportionate use of its network.<sup>81</sup>
127. As explained below, there is no merit to Bell's arguments either under the GAS tariff or under its Terms of Service and GAS customer contracts. Bell's defences to its *prima facie* violation of sections 24 and 25(1) of the Act are not supportable and CAIP's request for relief must therefore be allowed on this ground.

**A. Speed Is Intrinsic to the Definition of GAS Service**

128. Contrary to what Bell contends, the speeds associated with Bell's GAS service are not just "marketed" to competitors. These speeds are actually spelled out in Item 5410.4.(f)

---

<sup>80</sup> Bell has argued that "it is impossible for the Company to promise a specific bandwidth to high-speed service end-users (retail or wholesale GAS). Therefore, these services are marketed with an "up to" speed." See Bell Final Answer, paragraph 21.

<sup>81</sup> *Ibid.*, paragraphs 134 to 138.

of Bell's General Tariff (e.g., for residence users, the speeds are 256 Kbps downstream/256 Kbps upstream and 5 Mbps downstream/800 Kbps upstream).<sup>82</sup>

129. As noted earlier, GAS is a wholesale access service that provides ISPs and other telecommunications service providers with a "virtual pipe" over which they can deliver to their own end-user customers a variety of customized services, including high speed Internet access service, remote LAN access, VPN services, streaming audio and video services, dedicated data services and VoIP services.
130. The tariff for GAS (i.e., GT Item 5410) does not include any provisions that would permit Bell to implement DPI or other traffic shaping technologies, let alone to do so unilaterally and without prior notice of any kind. Bell advertises its GAS as a highly reliable service with "[n]o limit on data transfer". The following is an extract from the description of GAS contained on Bell's web-site:

Gateway Access Service is provided through a world class, fault tolerant, 24x7 monitored network.

**No limit on data transfer** so that your customers can surf and download 24x7

128 bit encryption on the connection to BCE Nexxia's network will ensure a **reliable solution to your customers**

Being a DSL technology, your customers will be able to talk and surf at the same time a compelling value proposition for dial up customers!  
[Emphasis added]

131. GT Item 5410 specifically references the speeds at which the service is to be offered and specifies the different monthly rates that are associated with these speeds.
132. In this regard, it is important to note that the Commission made a factual finding in Telecom Order CRTC 2006-258 ("Order 2006-258") that "information regarding the transmission speeds available for GAS is important to competitors, **who rely upon the availability of the advertised speeds to ensure that the GAS meets their requirements.**"<sup>83</sup>
133. The Commission also determined in the same Order that "given the sensitivity of competitors' business plans to speed availability, the tariff publication of such data with

---

<sup>82</sup> Bell Final Answer, paragraph 32

<sup>83</sup> Telecom Order CRTC 2006-253, paragraph 12, emphasis added.

respect to competitor services is more critical than it is with respect to retail services such as KeyPak.”<sup>84</sup> Finally, the Commission determined in Order 2006-258 that approval of the GAS tariff as proposed by Bell Canada will offer no recourse pursuant to the company's tariffs, ***should service complaints arise if Bell Canada does not deliver the proposed speeds.***<sup>85</sup>

134. In the view of CAIP, Order 2006-258 makes it clear that there is a very strong expectation on the part of the Commission that Bell must deliver the speeds set out in its GAS tariff to competitors who subscribe to this service. The fact that the Commission's ruling recognized that competitor business plans are highly sensitive to the speeds advertised in the GAS tariff and that competitors rely upon the availability of these speeds to ensure that GAS “meets their requirements” suggests that there is a strong presumption that Bell must honour the speed commitments referenced in both its GAS tariff and in its advertising materials to wholesale customers.
135. While there may be certain instances when Bell is unable to deliver the speeds reflected in the GAS tariff (*e.g.*, in instances involving network maintenance or outages),<sup>86</sup> there is nothing in the tariff or in any of the Commission rulings cited by Bell which authorizes it to *deliberately reduce* the speeds that are promised in the GAS tariff.
136. Thus, it is abundantly clear from Order 2006-253 that there is a high expectation on the part of the Commission that Bell is obliged to deliver the speeds referenced in the GAS tariff given the types of customer that subscribe to this service (*i.e.*, CLECs, ILECs and other telecommunications carriers).
137. CAIP further notes that the words “up to” as set out in this portion of Bell's GAS tariff were inserted into the tariff because the performance of this service can be affected by the quality of the *copper loop facilities* that link each customer premise to a Bell host or remote switch. For example, it may not be possible to achieve GAS speeds of 5 Mbps downstream/800 Kbps upstream in the case of an end-user customer that is served by a

---

<sup>84</sup> *Ibid.*, paragraph 13.

<sup>85</sup> Bell Final Answer, paragraph 34, emphasis added.

<sup>86</sup> During the proceeding that led to the approval of GT Item 5410, Bell stated that it would only engage in limiting bandwidth for wholesale services “in cases of troubleshooting or to protect the network infrastructure from congestion resulting from malfunctioning or mis-configured equipment or malicious hacking.” See Letter from Bell Canada to the CRTC, re: Bell Canada Tariff Usage Billing Notice No. 6767 (TN 6767) – Gateway Access Service (GAS), dated December 1, 2003.

copper loop facility that has excessive bridge taps or which is approaching the range of the ADSL equipment located at Bell's host or remote switches.

138. The words "up to" in Bell's marketing materials and, more importantly, its tariffs were not placed there in order to provide it with free rein to throttle its competitors' traffic. In particular, the "up to" language does not entitle Bell to *deliberately throttle* a 5Mbps downstream/800 kbps upstream service down to 30 KB/s for P2P traffic for over 10.5 hours a day each and every day. It is clear from GT Item 5410 that any limitations in GAS transfer speeds are directly related to the quality and characteristics of the copper loop facilities that are associated with each end-customer.

**B. Bell's Throttling Has Nothing to Do with Fair and Proportionate Use as There is No Evidence of Unfair and Disproportionate Use**

139. In the alternative, Bell argues that its Terms of Service as well as its contracts with its GAS customers contain provisions that allow it to take steps to ensure that users make fair and proportionate use of its network.<sup>87</sup>
140. The underlying premise of this argument appears to be that there is some form of unfair and disproportionate use. However, Bell conveniently skips over any discussion of exactly what unfair and disproportionate use it is seeking to curtail in its Final Answer. Presumably, this is because there is no evidence whatsoever of unfair and disproportionate use that has been established by Bell. Bell's arguments in this regard are, therefore, entirely devoid of meaning.
141. In particular, and as pointed out above, whereas at first, Bell argued that the wholesale throttling it had undertaken was necessary to guard against the 5% of users who were allegedly abusing Bell's network, Bell has essentially retracted the "evidence" that it initially put forward at paragraph 20 of its Interim Answer. Not only was there no evidence that this 5% of "users" were subscribed to the services of its GAS customers, Bell has essentially had to withdraw the statement in relation to its Sympatico subscribers as well. As a result, the Commission will find that there are no references to this "evidence" anywhere in Bell's Final Answer. However, this apparently is not stopping Bell from putting forward an argument that rests entirely on what we now know was a completely false premise.

---

<sup>87</sup> *Ibid.*, paragraphs 134 to 138.

142. Secondly, Bell's initial attempts to vilify P2P as a nefarious protocol that hogs bandwidth is now only weakly argued and is contradicted by the evidence in this proceeding. P2P does not seek out or take over more bandwidth than is allocated to each end-user under the GAS tariff. No matter how heavy a user an individual end-user might be (nor for that matter how many TCP/IP sessions that individual has running on his or her computer), that individual cannot exceed the maximal speeds allotted to his service as defined by the tariff. The point is that the bandwidth available to each end-user is not, despite Bell's attempts to cloud the issue, unlimited, but rather is capped or limited to the speeds specified in the GAS tariff. Therefore, the notion that the five per cent who are allegedly the cause of the problem are chewing up ever-increasing shares of the total capacity of Bell's DSLAMS, its fibre-based aggregation networks, its fibre-based transport networks, its fibre-fed remotes, or individual copper loops is not only improbable, it defies all logic and reason.
143. Thus, downloading a particular file in P2P as compared to html format takes up no more capacity. And certainly from an uploading perspective, P2P again cannot transmit communications any faster than what is allocated to each end-user under the GAS tariff and, indeed, by distributing the load over a distributed network, actually takes up bandwidth more efficiently and less intensively than a file in html format.
144. Furthermore, as explained above, the example of Comcast, a cable carrier who similar to Bell was throttling all P2P content on its network but has either discontinued or announced that it will discontinue this content-based measure largely discredits the "P2P as bogey-man" theory of network management.
145. While Bell's arguments in relation to the Terms of Service can be dismissed in their entirety on the basis that Bell has tendered no credible evidence of pervasive network abuse, even if there was even of modicum of evidence, CAIP denies that the Terms of Service may be invoked to authorize the blanket and systematic throttling of traffic throughout Bell's network.
146. First, CAIP notes that the Terms of Service cannot override the provisions of the Act. Thus, to the extent that the Bell's conduct constitutes a breach of the tariffing requirements of the Act (sections 24 and 25), the anti-discrimination provisions of the Act

- (subsection 27(2)) and the common carrier provisions of the Act (section 36), a provision of the Terms of Service cannot override such breach.
147. Second, all of the Commission decisions cited by Bell in support of its arguments relating to its Terms of Service, including *Cogeco, Rogers, Shaw and Videotron – Third Party Internet access service rates*, Telecom Decision CRTC 2006-77 which applies to the cable companies' TPIA service, merely stand for the proposition that a carrier may reduce or even terminate service to a *specific end-user or customer* if that specific end-user or customer is found to have prevented fair and proportionate use of carrier's network by others.
  148. In the present case, Bell has not provided one iota of evidence to show that any of its GAS customers are making disproportionate use of its network. In fact, the only evidence that Bell has tendered in relation to the congestion that it is allegedly experiencing in its network points relates to its own end-user customers, as opposed to its GAS customers.
  149. In the absence of such evidence, it is not open to Bell to point to its Terms of Service as a justification for throttling GAS customer traffic. These customers have not been shown to be the cause of any congestion or abuse in Bell's network (to the extent that such congestion even exists). Bell cannot therefore use discriminatory or arbitrary measures, such as selective throttling of P2P traffic, in relation to its GAS customers.
  150. Bell's argument with respect to similar provisions relating to network abuse allegedly found in the "Master Communications Agreement for Tariffed" (MCAT) services that each ISP purchasing GAS must execute" suffers from the same defects as identified above in relation to Bell's Terms of Service as well as another, more fundamental problem that vitiates the enforceability of such agreements.
  151. As pointed out by CAIP in its Interim Reply, CAIP has not been able to locate any Commission decisions which approve the use of the MCAT in association with Bell's GAS service. Moreover, neither CAIP nor the Commission has been provided with a copy of a MCAT such that the terms allegedly contained therein may be understood in their entire context.

152. It is CAIP's understanding that all ILEC agreements that are associated with tariffed services must be approved, in advance, by the Commission before they can take effect. Furthermore, the fact that some ISPs may have signed the MCAT does not mean that it has been approved by the Commission or, for that matter, that it has any legal force and effect. As Bell well knows, GAS service was offered on a non-tariffed (*i.e.*, illegal basis) for a number of years. During this time, ISPs were forced to sign agreements with Bell and its unregulated affiliate, Bell Nexxia, which contained provisions that would not have withstood regulatory scrutiny today.
153. Given that there are numerous provisions of the MCAT that would have undoubtedly been the subject of submissions to the Commission had the MCAT ever been filed with the Commission for approval, CAIP is forced to conclude that this agreement has never been approved by the Commission and is therefore unenforceable. Bell has offered no response to CAIP's concerns regarding the enforceability of the MCAT and the provisions thereof as cited by Bell.
154. As a final observation, CAIP notes that despite Bell's attempts to rely on its Terms of Service and past Commission decisions which are inapplicable to the present set of facts, it is abundantly clear from Order 2006-253 that there is a high expectation on the part of the Commission that Bell is obliged to deliver the speeds referenced in the GAS tariff. Accordingly, any actions taken by Bell to deliberately reduce the speeds set out in GAS tariff should be seen for what they truly are, namely a blatant attempt to unilaterally alter the terms and conditions of the GAS tariff without seeking prior Commission approval, as required under section 24 and subsection 25(1) of the Act.

**VII. BELL'S THROTTLING OF COMPETITOR TRAFFIC VIOLATES SECTION 27 OF THE ACT**

155. In its 3 April 2008 Application, CAIP requested that the Commission issue a cease and desist order as well as a "declaration that Bell has granted to itself an undue and unreasonable preference and subjected independent ISPs to an undue and unreasonable disadvantage by shaping, throttling and choking its wholesale ADSL services in the manner described in this Application."<sup>88</sup>

---

<sup>88</sup> CAIP Application, 3 April 2008, page 4.

156. In support of the foregoing request for relief, CAIP invoked section 27 of the Act and in particular, subsection 27(2) of the Act, which provides as follows:

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

157. Subsection 27(2) of the Act has its roots in the *Railway Act*, and exists to prevent carriers that own and operate network facilities from taking undue advantage of their size and superior market position to drive competitors from the market or to force customers to accept unreasonable terms of service. As the Board of Railway Commissioners demonstrated in an early telecommunications decision, the provision acts as a check on the natural propensity of companies that own network facilities to act in anti-competitive ways and to discriminate against customers who are perceived to be expensive, unprofitable or weak.<sup>89</sup>

158. This provision has been interpreted by both the Commission as well as the Federal Court of Appeal<sup>90</sup> as applying to actions taken by Canadian carriers against customers and competitors but also to any action in which a Canadian carrier grants to itself an undue or unreasonable preference.

159. Most recently, in *Regulatory framework for voice communication services using Internet Protocol*, Telecom Decision CRTC 2005-28 the Commission stated with respect to concerns about possible traffic degradation that “the Commission considers that it can rely on subsection 27(2) of the Act, where appropriate, to prohibit Canadian carriers from intentionally degrading traffic”.<sup>91</sup> In that same decision, the Commission referred to intentional degradation of internet traffic by a broadband service provider as “anti-competitive behaviour.” The instant case is exactly that – a case of intentional degradation of competitor traffic. Thus, the Commission's indication that it would be

---

<sup>89</sup> Board of Railway Commissioners, *The Western Associated Press v. The Canadian Pacific Railway Company's Telegraph and the Great Northwestern Telegraph Company of Canada* (1910) in *Sessional Papers of the Parliament of Canada* (Ottawa: King's Printers, 1911) at p. 275.

<sup>90</sup> See *Challenge Communications Ltd. v. Bell Canada* (1978), [1979] 1 F.C. 857 (C.A.), affirming CRTC Telecom Decision CRTC 77-16, at paragraphs 18-19, in which a predecessor provision to section 27 (section 321 of the *Railway Act*, R.S.C. 1970, c. R-2) was examined.

<sup>91</sup> Telecom Decision CRTC 2005-28, *Regulatory framework for voice communication services using Internet Protocol*, 12 May 2005 at paragraphs 448 to 483, especially para. 478 (“Decision 2005-28”).

prepared in such instances to act pursuant to subsection 27(2) is directly relevant to CAIP's Application.

160. In its Application, CAIP argued that Bell's throttling of competitor traffic gave rise to unjust discrimination, unreasonable preference and unreasonable disadvantage. Having reviewed the submissions of other interested parties in this proceeding and in particular the evidence of interested parties as to the effects of Bell's traffic shaping competitors, end-users, and content and application providers,<sup>92</sup> CAIP submits that concerns relating to Bell's throttling of competitor traffic arise in at least three distinct ways:

- (a) **P2P users and P2P content and application providers** are being subjected to unjust discrimination and an undue disadvantage;<sup>93</sup>
- (b) **Competitors and competitors' end-users** are being subjected to an undue disadvantage;<sup>94</sup>
- (c) **Bell** is conferring on itself an undue preference through the reallocation of bandwidth to its own ultra-high-speed Internet access services and to any number of other services (such as data and a range of value-added services provided by Bell to both business and residential end-users of Bell).<sup>95</sup>

**A. Discrimination Against and Disadvantage to P2P (And Other) Users and Content Providers**

161. Bell's traffic shaping measures overtly discriminate against users of P2P applications, since this is the type of end-user traffic or content that is being identified and filtered by Bell.

162. Users have suffered a marked and extreme degradation in their ability to access P2P applications and content. However, as submitted by numerous individual Canadians, the collateral or indirect effects of Bell's traffic shaping on services other than P2P traffic are also significant. As noted above, other applications or content that have been affected are as follows:

---

<sup>92</sup> See a summary of same in this Reply, section IV.

<sup>93</sup> CAIP Application, 3 April 2008, paragraph 70; Google Inc., 3 July 2008, paragraph 20.

<sup>94</sup> CAIP Application, 3 April 2008, paragraph 69 and CAIP Interim Reply, 24 April 2008, paragraph 56.

<sup>95</sup> CAIP Interim Reply, 24 April 2008, paragraph 56.

- (a) VPN Services: VPN services allow users to work remotely from home. Many interested parties to this proceeding have indicated that their VPN functionality has declined synchronously with the deployment of traffic shaping techniques by Bell Canada. Reported symptoms include dramatically reduced response times (slow service), the frequent loss of connections and the inability to connect to workplace VPNs.
  - (b) VoIP services: Several parties, including some of CAIP's own members, have performed and submitted test results in this proceeding showing that VoIP calls of end-users who have opened P2P files are degraded both during and after the P2P session is over. These test results are consistent with what at least 12 end-users reported in comments to the CRTC, and with numerous comments on private online forums.
  - (c) Encrypted communications: Wireless Nomad reported that many forms of encrypted communications (including SSH sessions) have been "crippled" by Bell's traffic shaping practices. This is corroborated by reports in online user groups.
163. Bell's oft-stated purpose for shaping is to allow for a "better allocation of bandwidth for all users."<sup>96</sup> However, a minority of users, those who use P2P, have been consciously excluded and those who use the non-P2P applications above have been indirectly excluded from the alleged benefits of Bell's measures.
164. Bell's traffic shaping measures target P2P traffic and degrade service with respect to those applications, capping file transfer speeds at a tiny percentage of the maximums outlined in the GAS tariff. As CAIP and other interested parties have demonstrated in detail throughout these proceedings, P2P users suffer concrete negative effects as a result of network throttling.
165. CAIP would also draw the Commission's attention to the fact that by targeting P2P traffic, Bell is not merely discriminating against specific applications and application users, but also application programmers and developers, content creators and distributors, and service providers who use and rely on specific technology. For example, it is now a well-documented fact that CBC's broadcast of its television show

---

<sup>96</sup> Bell Interim Answer, paragraph 16; Bell Final Answer, paragraph 110.

*Canada's Next Great Prime Minister* which was available on the CBC website in P2P format was rendered virtually inaccessible when end users sought to download it during Bell's daily traffic shaping period. Needless to say, P2P application or content providers have suffered a marked and extreme degradation of their ability to communicate their content to end-users. Legitimate and in some cases, real-time P2P content have been subjected to a drastically reduced transfer rates.<sup>97</sup>

**B. Disadvantage to Competitors and Competitors' End-Users**

166. Throttling of P2P file transfers dramatically reduces the speed and utility of Internet access services that can be provided by independent ISPs to their end-users. This subjects both competitors and their end-users to a clear disadvantage, especially where ISPs market and consumers purchase access services that promise unfettered access to all forms of data transfer.

**C. Preferential Re-Allocation of Bandwidth to Bell's Ultra High-Speed Internet Access and other Services**

167. To the extent that the bandwidth freed up by Bell is being re-allocated to Bell's other services, Bell is conferring upon itself an advantage.
168. Within its traditional operating territory in Ontario and Quebec, Bell is the incumbent LEC and controls a ubiquitous local access and transport network. As a true vertically integrated carrier, Bell uses its ubiquitous network in order to derive wholesale revenues from independent ISPs while at the same time competing against these ISPs in the largely forborne downstream retail market for Internet access services.
169. Throttling of P2P file transfers dramatically reduces the speed and utility of Internet access services that can be provided by independent ISPs to their end-users. As Bell has admitted, the net result of this is that bandwidth is freed up for other uses. As per Figure 2 above, these other applications include video store and IPTv services, security surveillance services, hosted web hosting and e-mail exchange services and remote learning/training, none of which involve access to the public Internet. On the business side, aggregated ADSL access services like GAS are being used to provide the same list of services as well as payment gateway services and other value-added services.

---

<sup>97</sup> Services such as Joost, Babelgum, Miro, Reeltime and Vuze distribute audio-visual content using various P2P protocols. For a description of these services, please see Campaign for Democratic Media, 3 July 2008, paragraph 28 and Appendix.

170. Bell also distributes broadcasting or other audio-visual content and offers competing access services. It has a direct pecuniary interest in disadvantaging its competitors in the name of maintaining “quality of service” with respect to its own data. The evidence is that Bell acted on this incentive to prefer its own services:
- (a) The fact is that Bell was able to offer upgraded 7 mbps and 16 mbps “Max” DSL service and to roll out a new high-speed video download service at the same time that it saw fit to apply traffic shaping to “free up bandwidth” on its network;
  - (b) Shortly after Bell began throttling of competitor traffic, Bell launched its Video Store, an online service which allows users to download movies and television programs. Unlike its major competitors such as BitTorrent, Bell’s Video Store does not rely on P2P technology and, consequently, movie downloads from this site are not affected by Bell’s throttling measures. Consequently, by targeting and disrupting P2P traffic, Bell conferred on itself a competitive advantage vis-à-vis its competitors in media distribution.
  - (c) Bell’s decision to begin throttling of competitor traffic also coincided with its introduction of IPTV on a commercial basis. Bell is currently providing IPTV on a limited basis in Ontario and Quebec, but its annual reports and quarterly statements to investors make it clear that it is investing heavily in IPTV and that it intends to significantly expand its presence in the terrestrial content distribution business.

**D. Bell’s Answer to CAIP’s Section 27 Concerns**

171. Bell argues that its traffic shaping neither discriminates, disadvantages or prefers by virtue of the fact that the company also throttles its own retail customers. This assertion is specious, as it is based on an deceptively narrow interpretation of the meaning of “discrimination” and “preference”.
172. Furthermore, this argument is replete with errors. Bell insists on looking solely at what it itself is doing in the retail Internet access market when there is nothing in subsection 27(2) that requires the Commission to do so. In other words, it offers its throttled Sympatico customers as a comparator group for the purposes of CAIP’s claims of discrimination against its members. In support of this argument, at paragraphs 148-153

of its Final Answer, Bell refers to one CRTC Order and two Decisions; none of which apply to the present case.<sup>98</sup>

173. By way of reply, CAIP submits that for purposes of a subsection 27(2) analysis involving a carrier's modifications to a wholesale service such as GAS service, whatever Bell is doing to its retail service customers is irrelevant. The concerns raised by CAIP in relation to the undue disadvantage to which competitors and their end-users have been subjected, the unjust discrimination and undue disadvantage to which P2P users and content providers have been subjected, as well as the preferences that Bell has conferred on itself with respect to services other than regular and "lite" Sympatico Internet access are appreciable without drawing any false comparisons or analogies to Bell's throttling of its retail Internet users.
174. Furthermore, for the purposes of analysing CAIP's submissions, it is important to dispel a false premise that seems to permeate this aspect of Bell's Answer and indeed its submissions overall. Bell appears to be inviting the Commission to assume that retail Internet access service is not the only relevant downstream market from wholesale GAS services. Aggregated ADSL access services are used by Bell and wholesale customers to provide a range of services of which access services to the public Internet is but one. The conclusion to be drawn from this is that the bandwidth that Bell manages to free up by discriminating or disadvantaging P2P users and content providers can be allocated by Bell to itself in relation to the provision of an array of services other than retail Internet access. Thus, the focus on Bell's throttling of its retail Sympatico users' traffic is misplaced.

#### **E. Unjust or Undue Nature of Bell's Discriminatory/Disadvantageous/Self-Preferential Measures**

---

<sup>98</sup> For example, in Order CRTC 2000-789, Terms and rates approved for large cable carriers' higher speed access service, the Commission states that it would be a violation of 27(2) if a cable carrier were to place restrictions in a carrier's access tariff that do not apply to its own Internet service. While this provides an example of where the CRTC would find a contravention of s.27(2), it says nothing about the present case, and it in no way implies that a violation cannot occur where a carrier does not directly restrict a competitor's service differently from its own.

Similarly, Bell refers to Telecom Decision CRTC 2006-77 Cogeco, Rogers, Shaw and Videotron – Third-Party Internet access service rates, where the Commission states that a cable provider must treat its competitors end-users equally to its own. Again, however, this decision does not mean that Bell is in compliance with s.27(2) simply because it throttles its own customers as well.

Finally, in Telecom Decision CRTC 2006-61, Access to the Quality of Service Enhancement Service of Shaw Cablesystems G.P. (Shaw) and PacketCable Functionality is also different from the case at hand, as it deals with the provision of Quality of Service enhancements. Most importantly, in that case, the Commission found no discrimination between different types of traffic, whereas in the present case there is a clear preference given to non-P2P traffic.

175. Subsection 27(4) of the Act requires that where a carrier undertakes discriminatory practices, it bears the onus of showing that such practices are not undue. Bell's evidence does not come close to discharging this onus. Bell's evidence and submissions largely amount to denials that it would engage in anti-competitive practices or to tired representations as to the supposedly vibrant state of competition in retail Internet access markets.
176. With respect to the latter claim, CAIP reiterates its above submission that the downstream retail Internet market is not the only retail market to consider. Certainly, the subjection of P2P users and content providers to unjust discrimination and an undue preference has nothing to do with the retail Internet access market. Furthermore, when it comes to assessing the undueness of the preference that Bell is conferring on itself by re-allocating bandwidth freed up by throttling, the universe of Bell data services stands to benefit.
177. In any event, CAIP notes that the rosy picture of competition painted by Bell in the retail Internet access services market is unrealistic. Bell's share of the retail Internet access market showed a steady net increase last year.<sup>99</sup> As pointed out by interested parties in this proceeding, cable and ILECs operate as a cozy duopoly in the retail Internet access services market.<sup>100</sup> By throttling its competitors' GAS traffic by means of its control over the access and transport facilities required by competitors to provide Internet access services as well as other IP-based services, Bell is effectively dictating the characteristics of competitors' retail offerings. There is no question that in the longer term, the effect of this kind of control over competitors' retail service offerings will result in a substantial lessening of competition in retail Internet access and other services markets.
178. While CAIP's Application on section 27 grounds could be determined on the foregoing basis and notwithstanding Bell's onus which it has not discharged, CAIP submits that the preferences, disadvantages and discrimination to which it has subjected competitors, end-users and content and application providers is undue and/or unreasonable for a number of reasons, only the most prominent of which are summarised below.

---

<sup>99</sup> According to Bell's 2007 Annual Report, Bell served over 2 million high speed customers as of the end of 2007; an increase of 6.8% from the end of 2006, and over 16% from the end of 2005.

<sup>100</sup> See ACANAC, 3 July 2008, paragraph 12.

1. *Not Justified by Alleged Congestion*

179. CAIP notes, as submitted above, that Bell has failed to adduce convincing evidence that its network is significantly congested and that P2P applications and abuses are responsible for the alleged congestion. Furthermore, there is no demonstrable or rational connection between the measures imposed by Bell on its competitors and the reduction of this harm, as there is no evidence whatsoever that the alleged network congestion is as a result of subscribers to competitors' services.

2. *Disadvantaging of Competitors and Competitors' End-Users Not Justified by an Approved Tariff or Other Instrument with Binding Legal Force*

180. CAIP notes that Bell has not even attempted to address the fact that Bell has no right to manage the end-user services of its competitors' customers. Traffic shaping is not a "network management" technique so much as a *service management issue*. In the case of ISPs, the filtration of certain types of traffic and the throttling back of the speed of the Internet access service *might* be a right provided for by way of contract between the ISP and the end-user customer, much the same way that contracts between ISPs and their end-user Internet access customers might provide for the management of spam as part of managing an e-mail exchange service. However, Bell is clearly not privy to any such contracts with its competitors' customers.

181. The service in question is not retail Internet access service, but rather wholesale GAS service. While Bell may unilaterally introduce pricing and billing changes with respect to its own unregulated retail Internet access services, the same cannot be said of its tariffed wholesale services. Thus, consistent with CAIP's submissions in relation to sections 24 and 25 of the Act, CAIP submits that Bell's subjection of competitors and competitors' end-users is undue because it is not authorised by a tariff and it contravenes the Commission's notification of network change policies.

3. *Not Justified as a Proportional and Tailored Measure*

182. Even if there is any congestion in Bell's network, which CAIP denies, CAIP submits that in order to prove that Bell's traffic shaping measures are justified and/or are not undue, Bell bears an onus to demonstrate that these measures are not unduly discriminatory, disadvantageous and preferential.

183. In this regard, CAIP notes that in the United States, the Chairman of the FCC has testified that the FCC is concerned amongst other things about Comcast's blanket throttling of P2P traffic, also during so-called peak hours, precisely because Comcast applied its traffic shaping measures without regard to specific locations and instances of proven congestion in its network.
184. In addition, there is no rational connection between the objective of controlling abuse and Bell's decision to throttle all P2P users on both uploads and downloads of P2P (when as discussed above, there is no issue of congestion or disproportionate use on download connections), as these measures affect potentially thousands or hundreds of thousands of "innocent" users. Bell's retail Terms of Service tariff contains provisions that allow it to suspend or terminate service where a customer uses or permits others to use services so as to prevent fair and proportionate use by others. Notably, the Terms of Service do not allow Bell to degrade the service of its customers (regardless of the service that they are subscribed to), by targeting specific applications at Bell's whim without notice of any kind.
185. As set out above, there are far less intrusive and tailored ways for which Bell already has the tools to address any network congestion or abuse problems. Bell has not demonstrated that it is applying traffic shaping only when and where congestion arises. In fact, Bell insists that it can with impunity, without notice, in undisclosed locations and in an undisclosed manner, throttle bandwidth on its network. As a result, CAIP submits that Bell's subjection of users, content providers and competitors to disadvantages and discrimination and the conferral on itself of a preference is undue and unjust.

#### *4. Desire to Level the Playing Field*

186. By degrading the quality of service provided by independent ISPs to their end-users, Bell advantaged itself in the retail Internet access service. It is relevant to note that the need to throttle its own retail customers arose from Bell's desire to free up bandwidth for other ultra-high-speed services (namely, its 7 Mbps and 16 Mbps services to "premium" Sympatico customers). Similar services are not available through the GAS tariff.
187. Certainly, the discussions in the blogosphere documenting negative customer reaction to Bell's retail throttling suggests that Bell had reason to be concerned about the competitive repercussions to it to throttle as a precursor to moving to premium billing.

188. Bell deliberately used traffic shaping measures to enhance its competitive advantage as a retail Internet provider by both reducing its competitors' ability to differentiate their services, and by freeing up or reserving bandwidth for its own content and enhanced services.

### **VIII. LACK OF NOTICE OF NETWORK CHANGES**

189. In its 3 April 2008 Application, CAIP requested that the Commission declare that Bell has acted unlawfully and in a manner that is contrary to the requirement that a local exchange carrier that provides service to other local exchange carriers provide advance notice of network changes, pursuant to Decision 97-8.
190. None of CAIP's members have received any notices from Bell Canada regarding its intention to install DPI boxes on logical paths obtained by CAIP's members pursuant to the GAS service and to drastically reduce the speeds of certain traffic carried on these paths using the same or other equipment on Bell's networks. Likewise, none of CAIP's members have received any invitations or requests from Bell to conduct technical tests on the GAS using DPI technology. In the view of CAIP, by failing to provide notice of network changes that have affected the performance of the networks operated by CAIP's members, Bell Canada has acted in direct violation of the Commission's notification of network change rules as required by Decision 97-8.
191. Although nothing can remedy the chaos and loss of goodwill occasioned by the fact that competitors were caught by surprise by Bell's throttling of GAS services, CAIP submits that its request for declaratory relief and an order that Bell cease and desist from throttling remains relevant and necessary to the enforcement of mandatory provisions of the Act, namely sections 24 and 25(1) of the Act. The Commission's notification of network change rules provide an important vehicle for ILECs and competitors to resolve interconnection and other network management issues without resort to the Commission. Where issues cannot be resolved in this manner, the rules permit the orderly submission of disputes to the Commission, based on the results of joint testing and a minimum amount of disputed facts. This is in contrast to what transpired in the instant case as a result of Bell's secretive deployment of throttling on competitors.

192. In CAIP's view the facts in the instant case cry out for reaffirmation of the Commission's long-standing notification of network change rules and a declaration that deliberate flouting of these rules will not be tolerated.
193. In its Final Answer, Bell does not deny that the requirements of Teleglobe Canada Inc. – Construction Program for 1993, Telecom Decision CRTC 94-11 (Decision 94-11) and Decision 97-8 apply to it as an ILEC in the provision of GAS services. Rather, it attempts to argue that the notification of network change requirements do not apply because the throttling measures that it has undertaken are not the type of changes that trigger the notification requirement, and that the requirements therefore only apply to a change to “network-to-network interfaces”. In throw-away lines, Bell also weakly attempts to argue that GAS is not a bottleneck service because it is classified as non-essential and that the notification requirement only applies to carriers.
194. By way for reply and for the sake of completeness, CAIP states that GAS is a local exchange service for which there are currently no economically feasible alternatives (especially given Bell's inability or refusal to make ADSL access service at its central offices). Given that under the Commission's revised essentiality framework, only those services that are essential or are otherwise in short supply such that a failure to mandate same would lessen competition in downstream retail markets, there is no question that GAS is a “bottleneck” service for purposes of the application of the Commission notification of network change policies.
195. Second, CAIP notes that CLECs, long distance carriers and other types of carriers subscribe to GAS. Although this should not be determinative, CAIP has several carrier members that interconnect with Bell Canada for the purposes of receiving GAS. These carrier members use GAS to provision a variety of telecommunications services, including VoIP service as well as remote LAN access and other high speed Internet access services. Thus, Bell's failure to communicate the changes that it has been planning with respect to the GAS service cannot be excused on this basis.
196. CAIP reiterates that Bell's implementation of DPI and traffic shaping (quite apart from the breaches of section 24, 25(1), 27 and 36 of the Act) is a “network change” that falls within the Commission's long-standing requirements that

- (a) all local exchange carriers (LECs) must “provide advance notification of any network modification that may affect the operation of the networks of other carriers to which they are interconnected, pursuant to the rules and procedures contained in Letter Decision 94-11” and
  - (b) that “any LEC proposing changes must be prepared to conduct technical tests of the proposed changes with all of the carriers to which it is interconnected.”
197. While the term “network change” is not defined, CAIP submits that Bell’s throttling of GAS services certainly required a modification of its network (installation of DPI boxes on the logical paths obtained by competitors under the GAS tariff as well as the installation of new equipment or reprogramming of existing network equipment to drastically reduce or interrupt the flow of competitor traffic to its intended destination). In addition, the effect of this modification was, as stated above, disruption that directly affected users. It is difficult to imagine a modification that affects the operation of a telecommunications network more than equipment installed in the ILEC’s network that is designed to open and inspect each packet of GAS service traffic and to slow down certain identified content.
198. CAIP notes that the circumstances here at issue represent an appropriate case for the Commission to apply its long-standing notification of network change rules. The harm that the Commission sought to avoid by imposing a notification requirement and the importance of such a notification to the enforcement of the mandatory provisions of sections 24 and 25(1) of the Act are obvious.
199. To wit, in Local Competition, Decision 97-8, the Commission concluded that “[f]ailure to provide notification of proposed network changes could lead to disruptions in the networks, which would affect network users.”<sup>101</sup>
200. The Commission further concluded that “the public interest requires that, in an environment of multiple interconnected networks, a very tight discipline be imposed on all carriers to ensure that no change is made without all interconnecting carriers having the opportunity to examine the proposed change, conduct tests and take action as required before the change comes into effect.”<sup>102</sup>

---

<sup>101</sup> Telecom Decision CRTC 97-8, para. 44

<sup>102</sup> Telecom Decision CRTC 97-8, para. 44.

201. As set out in CAIP's Application, the Commission's notification of network change requirements were put in place as Canadian telecommunications networks were opened up to competition. These rules were developed because the Commission at the time recognized that in order for competition to truly work, the networks of the former incumbents would have to be interconnected with those of competitors. As such, any changes made to the network of one carrier would have repercussions for the operations of a competitor.
202. The salutary effects of a notification requirement on the objective of enforcing the mandatory tariffing provisions of the Act are obvious. Transparency and notice in relation to measures that an ILEC intend to implement would allow the parties to understand why such measures are necessary, hopefully diminish disputes such as this one through a process of bilateral or multilateral exchanges of information. Irrespective of the merits of CAIP's Application, in the present case, it would have been much more preferable for Bell to have told its GAS customers of the changes that it would be implementing if only to reduce the chances of regulatory proceedings such as this, which consume financial and other resources of CAIP as well as the scarce resources of the Commission.
203. In essence, Bell left CAIP no option but to have to react in the way it did to Bell's unannounced measures. The secretive and non-transparent way in which Bell proceeded not only gave rise to significant harm and inconvenience to competitors, it also has potential ramifications for the predictability, efficiency and reliability of telecommunications in Canada. If carriers, like Bell, are allowed to make network changes without prior notice, what other changes Bell may impose on them next without giving any notice or an opportunity to engage in joint testing?
204. The sheer deliberateness and planning that must have gone into the implementation of traffic-shaping measures throughout its network makes Bell's breach of the Commission's "Notification of Network Changes" policies even more egregious. In fact, Bell was directly asked by independent ISPs at a meeting in November 2007 whether it intended to use DPI on its wholesale ADSL access services and the Bell representative at this meeting responded by stating that Bell only intended to use this technology in conjunction with its retail Sympatico high speed Internet service.

205. The policy rationale behind the Commission's Notification of Network Changes policies, which is to prevent network disruptions and disruptions to end-users and to provide competitors with the opportunity to examine, test and make contingency plans with respect to any proposed changes is still valid and, indeed, is more relevant than ever. Bell's deliberate flouting of these policies is a serious issue that merits thorough examination by the Commission. In the interim, that thorough consideration, Bell's apparently deliberate, surreptitious conduct should be enjoined by the Commission as requested by CAIP.

#### **IX. VIOLATION OF COMMON CARRIER OBLIGATIONS**

206. As noted above, in its 3 April 2008 Application, CAIP requested a final order "directing Bell Canada to cease and desist from using any technologies to "shape", "throttle" and/or "choke" its wholesale ADSL services", as well as a declaration that Bell has "acted unlawfully and contrary to the prohibition on carrier interference with the content of messages carried over its telecommunications network contrary to section 36 of the Act."

207. These requests for relief are based on the grounds that Bell's decision to unilaterally apply traffic shaping measures to GAS is contrary to s.36 of the Act.<sup>103</sup> This section of the Act provides as follows:

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

208. In its original Application, CAIP submitted that Bell's traffic shaping of its competitors' GAS traffic breached section 36 of the Act in the following ways:

- (a) Reducing the throughput of content by as much as 90%, and therefore altering the meaning of audio and visual content beyond recognition;
- (b) exercising control by classifying certain types of content as low priority and quarantining such content until released in a manner determined by Bell; and

---

<sup>103</sup> 1993, c.38.

- (c) exercising control by discriminating between types of content and users of that content.<sup>104</sup>
209. Section 36 of the Act was modeled on s. 8 of the *Bell Canada Act* and had the effect of importing common carriage into the regulation of modern telecommunications technologies. This principle, which mandates that designated telecommunications networks be neutral as to customers and content, emerged from the British common law governing “public services” or what are today called “infrastructure services”.<sup>105</sup> The common law of common carriage required that a person who took up a “public calling” had to give service on demand and owed a general duty of non-discrimination to clients. While regulations have codified common carriage in many industries, notably railways and postal services, the common law still applies. As Professor C. Edwin Baker summarizes, “Common carriage is essentially a guarantee that a utility... will not arbitrarily or invidiously deny access.”<sup>106</sup>
210. In the field of telecommunications, common carriage emerged piecemeal in Canada from decisions made in the 1910s by the Board of Railway Commissioners with respect to telegraph and then telephone communications.<sup>107</sup> Then, as now, the common carrier principle was intended in part to prevent monopolies or oligopolies from acting as self-interested gatekeepers to the communications networks they control.
211. Canadian legislators and policy-makers since the 1960s have been attuned to the dangers associated with granting monopoly status to owners of new or rapidly changing telecommunications networks.<sup>108</sup> First with s.8 of the *Bell Canada Act* and then with section 36 of the *Telecommunications Act*, Canadian law has made it a condition of participation in telecom that network owners remain agnostic as to the content they carry. It has been said that this section “reflects the concern that carriers might use their

---

<sup>104</sup> CAIP Application , 3 April 2008, pp 23-25, paras. 87-95; CAIP Interim Reply, 24 April 2008 pp. 23-24, paras. 74-79.

<sup>105</sup> Eli M. Noam, “Beyond Liberalization II: The Impending Doom of Common Carriage,” (1994) 18(6) *Telecommunications Policy* 435 at 436-437.

<sup>106</sup> C. Edwin Baker, “Merging Phone and Cable,” (1994) 17 *Hastings Comm. & Ent. L.J.* at 122.

<sup>107</sup> Board of Railway Commissioners, *The Western Associated Press v. The Canadian Pacific Railway Company's Telegraph and the Great Northwestern Telegraph Company of Canada* (1910) in *Sessional Papers of the Parliament of Canada* (Ottawa: King's Printers, 1910). See also, Dwayne Winseck, *Reconvergence: A Political Economy of Telecommunications in Canada* (New Jersey: Hampton Press, 1998) at 100-109.

<sup>108</sup> See, e.g. Report of the Canadian Computer/Communications Task Force, *Branching Out* (1972), Vol. I; Telecommission, *Instant World* (Ottawa: Information Canada, 1971).

position as providers of telecommunications services in a manner that would give them an unfair advantage over firms engaged in the provision of content.”<sup>109</sup>

212. The principle of common carriage expressed in this provision also protects the Canadian constitutional values of democracy and free speech. In telecommunications, common carriage helps shield mediated communication from the influence of those who own and control the means of that communication.<sup>110</sup> In the context of internet communications, Craig McTaggart of TELUS explains that section 36 “gives effect to the principle that ISPs should not be permitted to interfere with the ability of their customers to access and use the legal Internet content and applications of their choice,” a principle that is now often referred to as “network neutrality.”<sup>111</sup> Interference or influence may take the form of direct and purposeful censorship, as in the case of TELUS’ past denial of access to pro-union websites,<sup>112</sup> or structural factors like traffic shaping that classify and impede the flow of certain kinds of expression according to values assigned by the network owner. In either case, where the common carriage principle is watered down or unenforced, the incentive for carriers to subordinate the “economic and social requirements of users”<sup>113</sup> to their own private interests is increased.
213. In order to throttle Internet traffic originating from or destined for end-user customers of independent ISPs, Bell uses DPI technology to identify and then selectively impede targeted traffic types from reaching their destination as originally intended.
214. As noted above, it has been postulated by several learned commentators that Bell’s traffic shaping measures do not merely slow down (albeit drastically – down to 30 KB/sec rather than the upload/download speeds of 5 Gbps/800 kbps provided for under tariff) the carriage of traffic but may also cause bits of data to be dropped. This would mean that the actual content of a packet is being deleted, dropped, and hence, modified.
215. In addition, comments on the CRTC public forum, submissions from interested parties and the broader consumer backlash indicate that Bell’s practices have the effect of

---

<sup>109</sup> Michael H. Ryan, *Canadian Telecommunications Law and Regulation*, § 730 “Content of Messages”.

<sup>110</sup> Dwayne Winseck, “Canadian Telecommunications: A History and Political Economy of Media Reconvergence,” (1997) 22(2) *Canadian Journal of Communication* at 4. Winseck 1997 p. 4.

<sup>111</sup> Craig McTaggart, “Net Neutrality and Canada’s *Telecommunications Act*,” paper presented at the Fourteenth Biennial National Conference on New Developments in Communications Law and Policy, Law Society of Upper Canada, Ottawa, 25-26 April 2008.

<sup>112</sup> <http://thetyee.ca/News/2005/08/04/TelusCensor/>

<sup>113</sup> *Telecommunications Act* S.C. 1992, c.38, s.7(h).

rendering certain of these data transfers impossible or so slow as to be useless or undesirable to senders or recipients.<sup>114</sup> Immediately after Bell began throttling P2P many of its GAS customers received complaints about the prohibitively slow speed of their networks. “Eventual delivery”<sup>115</sup> of targeted data is not what users and competitors pay for, nor is it what they have a right to expect under the GAS tariff and the principle of common carriage.

216. This constitutes interference with or control of the content, meaning and purpose of telecommunications contrary to section 36 of the Act,<sup>116</sup> and furthermore violates the common law principle of common carriage, in at least the following ways:
217. At the most basic level, Bell violates the common carrier principle by using its DPI technology to peer into any and all data transfers on its GAS service and to classify, rank and manage them according to type and content. It bears repeating here that Bell’s GAS service is intended to be an opaque pipe with an end-user at one end and a third party ISP at the other. Bell’s role, for which it is well-remunerated, is solely to transmit data from one end to the other at a rate of speed defined by the GAS tariff. Any inspection, alteration or other interference with the data flowing through that pipe can only be undertaken with the permission of the Commission pursuant to section 36. At no time has the Commission given Bell this authority;
218. As alluded to above, it would appear that Bell’s traffic shaping measures do in fact alter the content of a packet, which is a unit of telecommunications.
219. Also as alluded to above, drastic delay of the kinds reported by individual Canadians and interested parties in this proceeding effectively results in Bell controlling or influencing the purpose of the telecommunications. In the context of ever increasing consumer expectations of convenient and instant communications, it is disingenuous for any carrier to claim that “eventual” delivery of telecommunications does not alter the usefulness and therefore, the purpose of telecommunications.
220. In response to CAIP’s section 36 arguments, Bell claims that because it does not exercise *editorial* control over its competitors’ content, its actions fall outside the ambit of

---

<sup>114</sup> CAIP(CRTC)15May08-3.

<sup>115</sup> Bell Final Answer , paragraph 222.

<sup>116</sup> 1993, c.38.

section 36, Bell cites a number of Commission decisions in which parties have invoked section 36. It appears to be arguing that these cases exhaustively define the parameters of “controlling content”<sup>117</sup> when there is no suggestion by the Commission to that effect in the decisions. The decisions referred to by Bell indeed offer a number of examples of where the Commission has found that a carrier had the incentive and the means to control the content of telecommunications. However, in no way do these cases provide a complete list of instances where such control arises.

221. Bell fails to address the concern that slowing down telecommunications in as drastic a fashion as it is doing in this case constitutes control of or influence over the meaning and purpose of telecommunications.
222. Rather, in its Answer and other submissions, Bell has stated self-servingly that *all* P2P data transfers should be considered the postal equivalent of “bulk” or “lower urgency” mail, and that such transfers are never “time-sensitive” to the same extent as web browsing and other applications.<sup>118</sup> This is a *direct imposition of meaning* onto a massive quantity of data. In order to justify this reframing Bell employs a postal analogy, explaining that the postal service must allocate its resources in order to effectively deliver packages according to how time-sensitive they are.<sup>119</sup> In the present case, this analogy is fatally flawed, since postal service customers have the freedom to *decide for themselves* the urgency of their packages, and to pay the postal service a fee based on how quickly they want their packages delivered. Bell’s high-handed imposition of traffic management is more appropriately analogized to a postal service that opens each package, decides according to its own priorities how important the contents are, and delivers it at a speed of its own choosing, notwithstanding the needs or intentions of package senders and recipients.
223. It is important to note that Bell claims the right to unilaterally *and secretly* perform this prioritization of any and all data across the networks it controls.<sup>120</sup> In response to complaints about this practice, Bell counters that it merely impedes P2P transfers for 10.5 hours a day and *only* to a fraction of maximum speeds. Throttled data, it argues, is

---

<sup>117</sup> Bell Final Answer, paragraphs 219-221.

<sup>118</sup> Bell Interim Answer, Appendix 1, page 5

<sup>119</sup> *Ibid.*

<sup>120</sup> Bell Final Answer, paragraphs 118 and 161.

“eventually delivered” and since all P2P data is “not time sensitive, there is no change, impact or influence of the ‘meaning or purpose’ of the telecommunication”.<sup>121</sup>

224. By way of reply, CAIP notes that the common carriage principle as enshrined in section 36 of the Act is a fundamental principle of telecommunications law that must be constantly adapted to changes in technology. Technology has increased the speed of telecommunications, such that consumers have heightened expectations of instant communications. In this environment, to deny that timeliness and speed of communications is of significant import or to assert that “eventual” delivery of a telecommunications is just as good, is unrealistic. CAIP notes that the speed of GAS services as well as the speed of downstream retail services, including but not limited to Internet access services are equally intrinsic to the desirability and purpose of applications, content or underlying telecommunications services to competitors and their end-users alike. To argue as Bell does that a lack of timely access to telecommunications does not affect its meaning or purpose is simply not credible.
225. Adding to this interference is the collateral damage reported by end-users whose non-P2P applications are also intentionally or unintentionally affected by Bell’s traffic-shaping techniques. Dozens of contributors to the CRTC public forum have complained that their VPN networks, VoIP services, internet gaming and other applications are adversely affected or rendered inutile when Bell “flips the switch” each day.<sup>122</sup> Bell admits that some applications other than P2P may be negatively affected by DPI, and claims to be working with ISPs and end-users to mitigate such effects.<sup>123</sup> To the extent that these issues go unresolved, the result for end-users is that their telecommunications are rendered purposeless or meaningless by virtue of being incomplete or degraded beyond use.
226. Enacted across the telecommunications archipelago, these kinds of network control techniques will inevitably shape the meaning or purpose of the internet itself, transforming it from a content-neutral and democratically-accessible set of data pipes to a system that is regulated, managed, censored and filled primarily with packaged

---

<sup>121</sup> Bell Final Answer , paragraph 222.

<sup>122</sup> CAIP(CRTC)15May08-5.

<sup>123</sup> Bell Final Answer, paragraphs 119 and 122: “the vast majority of these problems are not related to the deployment of DPI technology” and “most of these [problem] cases were related to issues with the end-user’s DSL line and not DPI”.

content by profit-seeking carriers. CAIP submits that the Commission has it within its power and its mandate to act decisively to prevent this outcome.

#### **X. BREACH OF END-USER CUSTOMER PRIVACY**

227. Bell admits that in order to throttle Internet traffic, it employs DPI technology to intercept data packets, examine the packet data and header information, and then impose rules on its movement and delivery. This aspect of Bell's traffic-shaping activities raises concerns that these practices violate the privacy of its wholesale customers and end users. CAIP submits that Bell's actions in this regard run counter to the letter and spirit of Canadian telecommunications policy objectives, and represent a slippery slope towards further and more egregious violations of privacy in the future. As such, the Commission should require that Bell cease and desist using its DPI technology until such time as privacy issues are addressed.
228. Privacy has been held to be a key legal and social interest for Canadian citizens. There are two important aspects to the right to privacy in the present context. The first is the right of individuals to privacy, and the second is the duty of others, and in particular common carriers such as Bell, to act in a manner which preserves and protects the right to privacy.
229. According to subsection 7(i) of the Act, a core objective of Canadian Telecommunications policy is to "contribute to the protection of the privacy of persons." This objective prefigured and now embodies the growing concern in contemporary society with respect to technologies that allow the collection and exploitation of personal information on a massive scale. Section 47 of the Act mandates that the Commission "*shall* exercise its powers and perform its duties... (a) with a view to implementing the Canadian telecommunications policy objectives." [emphasis added] The objective of privacy protection is also built into section 36, which codifies the principle that common carriers must blind themselves as to the content on their networks. These provisions indicate that the Commission is mandated to take an active role in protecting the privacy of Canadians.
230. In 2006, the Telecommunications Policy Review Panel (TPRP) reviewed the CRTC privacy protection mandate, concluding that the Commission and the Privacy

Commissioner have “complementary roles regarding privacy protection.”<sup>124</sup> The TPRP found that the CRTC has jurisdiction over privacy issues related to the operation of telecommunications networks and recommended that the CRTC should “*directly regulate* all TSPs to the extent necessary to implement the Canadian telecommunications policy objectives...”.<sup>125</sup>

231. Section 7(i) of the *Act* also coheres with provisions in other laws of general application in Canada which establish the principle that private communications may not be interfered with or intercepted without lawful jurisdiction. The *Canada Post Corporation Act*<sup>126</sup> for instance, deems it an offence when any unauthorized person opens, delays or detains or permits to be opened, any mail. That “snail mail” and electronic data packets are substantially analogous is acknowledged by Bell in its submissions to the CRTC.<sup>127</sup>
232. Bell Canada’s statements with respect to the operation of DPI technology are misleading and merit further explanation. In Bell’s initial Answer to CAIP’s application, it claimed that its DPI technology “can look at other identifying characteristics of the envelope, but not inside the envelope.”<sup>128</sup> Upon further interrogation by the Commission, however, Bell admitted that not only could DPI open the data envelope, it could detect and record the sender, recipient and contents.<sup>129</sup>
233. Indeed, the ability of DPI technology to access and collect the personal information of individual network users is well documented by both its manufacturers and its critics. Ellacoya, the provider of Bell’s DPI systems, advertises that its products “identify subscribers, [and] classify and control applications on a per-subscriber basis,” offering “granular network visibility”.<sup>130</sup> As CIPPIC has noted, individual data packets inspected through DPI

are (or can be) associated with identifiable subscribers via the IP addresses attached to those data packets. Moreover... the data typically examined by DPI systems involve much more than IP addresses: the whole purpose of DPI is to ‘open the envelope’ in

---

<sup>124</sup> Telecommunications Policy Review Panel, *Final Report*, 22 March 2006, page 6-14.

<sup>125</sup> *Ibid.* Emphasis added.

<sup>126</sup> R.S.C. 1985, c.C-10.

<sup>127</sup> Bell Interim Answer, Appendix 1, page 4.

<sup>128</sup> Bell Interim Answer, Appendix 1, page 4.

<sup>129</sup> Bell Canada(CRTC) 15May08-7 CAIP Part VII Abridged.

<sup>130</sup> <http://www.ellacoya.com/news/pdf/2007/NXTcommEllacoyaPI.pdf>

order to discern details about the traffic such as its type or source.<sup>131</sup>

234. Having finally admitted that its DPI technology has these capabilities, Bell argues that it has deployed DPI only to examine data packet headers - the equivalent of reading addresses on "snail mail" envelopes. But for some applications – like BitTorrent – the packet header does not reveal that the contents are P2P or torrent data, in the same way that the address on an envelope generally says nothing about what is contained within. The only way to determine what kind of content is being sent is to *look into the envelope*. To explain this inconsistency in its claims, Bell states that it "looks at the *application header of the content* but not the content itself."<sup>132</sup> This is nonsensical. To clarify, the "application header" or protocol showing which application created the data packet is embedded in the data payload.<sup>133</sup> To complete Bell's postal analogy, its traffic-shaping equipment opens the envelope and scans the letter to determine whether, according to Bell's current priorities, it constitutes material that should be put on the slow boat to its destination.
235. Carriers like Bell or other persons who electronically monitor or eavesdrop on the content of telecommunications are thus in a position to ascertain the location, identity, interests and predilections of individual subscribers who have not consented to such treatment. By examining the packet data and packet header information of GAS customer traffic, Bell can identify, *inter alia*, the type of data being transferred, the ISP network used, and the end-user's intention to acquire certain types of Internet content. All of this is personal information under Canadian privacy legislation.
236. As demonstrated in CIPPIC's recent complaint to the Privacy Commissioner of Canada, this unauthorized access is in violation of Principles 4.3 and 4.8 of the Personal Information Protection and Electronic Document Act (*PIPEDA*) Schedule 1.<sup>134</sup> Given that the TPRP identified the Commission as a partner in privacy protection with the Privacy Commissioner, such violations in the operation of a telecom network should also attract the Commission's attention.

---

<sup>131</sup> CIPPIC Privacy Commissioner Complaint appended to CIPPIC on behalf of CDM, 3 July 2008, paragraph

23.  
<sup>132</sup> Bell Interim Answer, paragraphs. 8 and 41. Emphasis added.

<sup>133</sup> On this point, see *Vaxination informatique*, 3 July 2008, pages 16-21.

<sup>134</sup> CIPPIC Privacy Commissioner Complaint appended to CIPPIC on behalf of CDM, 3 July 2008

237. Furthermore, and perhaps more importantly, in secretly deploying its DPI systems to discriminatorily throttle internet traffic, Bell has already shown itself to be willing and able to undertake privacy-invasive actions *without the prior knowledge or consent of end-users*, both on its own network and on the networks of its wholesale clients. Whether or not Bell's claims that it does not store or otherwise exploit personal information are true, individual Canadians and the Commission should be concerned that without decisive action on the part of the Commission to sanction present and future breaches of telecommunications privacy, carriers such as Bell may see themselves as entitled to engage in even more invasive activities in the name of "network management" or "quality of service".
238. According to its manufacturers, DPI technology can with increasing facility violate internet users' privacy and provide ISPs like Bell with "unprecedented visibility into subscriber usage [and] subscriber-specific service activity".<sup>135</sup> Ellacoya has recently rolled out what it refers to as the "Personal Internet," a DPI-driven network control system that allows ISPs to control access to content at the level of individual subscribers.<sup>136</sup> Under the slogan of "customer choice," this system permits carriers to "steer" users away from competitors and towards the carrier's own content and services.<sup>137</sup> Clearly this would also constitute both an undue preference under subsection 27(2) of the Act and "control of content" under section 36.
239. It is important to reiterate that regardless of how or why Bell may currently be using the personal information of network users, the manner in which it goes about its traffic-monitoring and shaping techniques *by its nature* violates the privacy of both resellers and end-users. Each and every data packet sent or received by users of Bell's networks is or has the potential to be scanned by DPI software that can and does associate it with a user.<sup>138</sup> In the absence of decisive action by the CRTC, these techniques open up the possibility for far greater violations by Bell or other network owners.

---

<sup>135</sup> Ellacoya Networks, "Ellacoya Brings Unmatched Scale and Intelligence to Broadband Service Optimization" News Release (25 January 2007) online: Ellacoya Networks

[http://www.ellacoya.com/news/pdf/2007/Ellacoya\\_e100PressRelease.pdf](http://www.ellacoya.com/news/pdf/2007/Ellacoya_e100PressRelease.pdf)

<sup>136</sup> <http://www.ellacoya.com/news/pdf/2007/NXTcommEllacoyaPI.pdf>

<sup>137</sup> More alarmingly, Narus, Inc., a DPI manufacturer employed by the governments of the U.S., Saudi Arabia and China to surveil and intercept electronic communications, offers its clients the ability to examine data packets and to create a record of emails, web browsing, VoIP calls, and so on. See Nate Anderson, "Deep Packet Inspection meets 'Net neutrality, CALEA,'" (July 2007), online: <http://arstechnica.com/articles/culture/deep-packet-inspection-meets-net-neutrality.ars>. See also <http://www.narus.com/solutions/index.html>

<sup>138</sup> Bell's statement that by identifying a username of a sender or recipient or the location of a modem inside a subscriber's house, it is not identifying the subscriber "personally" is disingenuous at best and laughable at worst. It

**XI. CAIP'S REQUESTED RELIEF IS CONSISTENT WITH THE PUBLIC INTEREST AND THE CANADIAN TELECOMMUNICATIONS POLICY OBJECTIVES**

240. CAIP submits that the relief requested in its Application is consistent with the policy objectives set out in section 7 of the Act and with the 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 (the Policy Direction). In particular, CAIP submits that the relief requested by CAIP in this Application is consistent with the Canadian telecommunications policy objectives of

(a) ... facilitat[ing the] orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions;

(b) ... render[ing] reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada;

(c) ... enhanc[ing] the efficiency and competitiveness, at the national and international levels, of Canadian telecommunications;

...

(f) ... foster[ing] increased reliance on market forces for the provision of telecommunications services and to ensure that regulation, where required, is efficient and effective;

(h) ... respond[ing] to the economic and social requirements of users of telecommunications services; and

(i) ... contribut[ing] to the protection of the privacy of persons.

241. CAIP submits that its Application promotes each of the foregoing Canadian telecommunications policy objectives but would like to point out two policy aspects of this proceeding in particular.

242. First, CAIP notes that an unprecedented number of individual Canadians have come forward to support CAIP's Application. They have come forward to express their desire to continue to access and/or disseminate content available on the public Internet using efficient P2P protocols. Individual Canadians have also expressed grave doubts as to the privacy of their telecommunications in the face of Bell's traffic shaping practices. Thus granting CAIP's Application would certainly promote the objectives of enhancing

---

reveals that Bell completely misunderstands the purpose of privacy legislation, which is to foster a society in which individuals feel protected from the unauthorized access to and use of their personal information.

the orderly development, reliability and privacy of telecommunications as set out in sections 7(a), (h) and (i) of the Act.

243. Second, Canadians also understand that what is at stake in this proceeding is the availability of competitive alternatives to the incumbents' Internet access and other retail telecommunications services. Bell's throttling of competitor GAS traffic provides Bell with an unprecedented level of control over the pace and extent of competition in downstream retail markets, particularly with respect to ability of competitors to manage and to independently design and package their own ADSL-based high speed service offerings. Since there are insufficient wholesale alternatives to the last mile access and transport functionality of GAS service, any lapse or failure on the part of the Commission to enforce the provisions of the Act and its rules thereunder will be used by ILECs as a justification to shape other forms of competitor traffic under the guise of "traffic management." Thus, granting CAIP's Application is important to promoting the efficiency and competitiveness of telecommunications and fostering reliance on market forces in relevant downstream markets.
244. CAIP notes that its Application does not seek the establishment of any new forms of regulation of wholesale or retail traffic. Rather, it is simply asking the Commission to enforce existing tariffs and the mandatory provisions of sections 24, 25(1), 27(2) and 36 of the Act and to take into account the pro-competitive objectives set out at 7(b), (c) and (f).
245. In this regard, CAIP notes that the relevant provision of the Policy Direction is paragraph 1(a)(i), which essentially reproduces the Canadian telecommunications policy objectives set out in section 7(f) of the Act including the ongoing requirement for the Commission to ensure that its measures "are efficient and proportionate to their purpose and... interfere with the operation of competitive market forces to the minimum extent necessary to meet the policy objectives".
246. Again, it is not possible to rely on market forces as a means of disciplining behaviour in downstream retail markets such as the market for high speed Internet access services, if the dominant provider of underlying access services in this market (in this case, Bell) is interfering with the ability of competitors to manage and design their own ADSL-based high speed service offerings. Indeed, there are no real market forces that can be said to

exist where a dominant supplier can dictate how its customers who compete with it in retail markets manage their own networks and package their own services.

247. In addition to paragraph 1(a)(i) of the Policy Direction, CAIP notes that paragraph 1(b)(ii) of the Policy Direction instructs the Commission to use measures, when relying on regulation, that are to the greatest extent possible “implemented in a symmetrical and competitively neutral manner”. Since Bell’s GAS service is a regulated service, the Commission should be mindful of this directive, especially when evaluating the highly selective and discriminatory aspects of decision to throttle the GAS traffic of its competitors.

## **XII. CONCLUSION AND RELIEF REQUESTED**

248. For all of the foregoing reasons, CAIP respectfully requests that its Application be allowed and that the relief requested at page 4 of the Application (as reproduced at paragraph 2 herein) be granted.

**APPENDIX I – CAIP’S ANALYSIS OF LACK OF WHOLESALE ALTERNATIVES TO GAS  
AND OTHER WHOLESALE DSL SERVICES**

*(Being an extract from CAIP’s 23 November 2007 Written Argument as submitted  
in the proceeding initiated by Telecom Public Notice CRTC 2006-14)*

22. Without a doubt, the single most important wholesale service that is used by independent ISPs is the incumbent telephone companies’ wholesale ADSL access service. This service is offered under a variety of names (e.g., GAS, HSA, wholesale Internet ADSL, ADSL Data Access service and ADSL WAN service) and it is available in several different speeds (eg., (eg., from 256 Kbps downstream/upstream up to 6 Mbps downstream/800 Kbps upstream. However, the basic elements of the service and its overall purpose is the same – wholesale ADSL access services use packet data technology installed within the ILECs’ central offices to create a virtual high speed access circuit which begins at the end customer’s premises and terminates at a specific ILEC central office within a metropolitan area where the data traffic on the circuit is handed-off to an ISP at a network-to-network interface (NNI) device or other point of interconnection.
23. The reason why wholesale ADSL access services are so important to independent ISPs is because they make use of the existing copper loops within the telephone companies’ local networks to create the last mile of access to the customer’s home or business. There is no need to use a different access facility to reach the end customer because the customer’s existing telephone line can be used to create this high speed connection.
24. Independent ISPs are not the only ones that value ADSL access technologies. Prior to the introduction of ADSL and other “xDSL” technologies in the market, the telephone companies were actually making plans, and taking active steps, to replace the copper plant within the access portion of their local telephone networks with fiber optic cable so that they could deliver a broader range of services to the home, including “video dial tone” services. The first step in this plant replacement process was to seek permission from the Commission to shorten or accelerate the depreciation lives associated with their outdoor copper plant so that they could retire this plant more quickly and replace it with fiber. With the introduction of xDSL technologies, however, it was necessary for the

ILECs to re-think the time frames for retiring their copper plant. All of a sudden, this plant had acquired a “second life” because it could be used to provide a number of broadband services to end-user customers without the need to engage in lengthy or costly fiber retrofitting programs at the level of the local loop.

26. Therefore, in the mid- to late 1990s and then through to the early part of this century, the ILECs embarked upon extensive ADSL deployment programs which saw the installation of ADSL “DSLAM” technologies in all of their central offices as well as a growing number of their remote offices. Today, the ILECs have an ADSL access network which provides the most extensive footprint of broadband access facilities to individual homes and small businesses than any other broadband network in the country.
27. Indeed, to date, no company has been able to deploy as vast a broadband access and transport network as the ILECs. One of the main reasons why the ILECs have been able to do so is because they were able to exploit a number of historical advantages that they enjoy as incumbent local telephone companies. Specifically, as former monopolies:
  - (i) the ILECs have a fully ubiquitous and fully funded local access and transport network which has been used as the “underlay” for their ADSL access and transport networks;
  - (ii) the ILECs have benefited from decades upon decades of guaranteed rates of return which have provided them with a highly stable source of income to finance their ADSL access and transport network. Even to this day, the ILECs are permitted to draw down funds from their deferral accounts to finance the deployment of next generation networks/technologies to rural and underserved areas of the country; and
  - (iii) the ILECs have enjoyed a monopoly in the provision of local telephone service which they have used to leverage and cross-sell their high speed Internet access services.
28. In practical terms, what this means is that new entrants in the market such as ISPs, VoIP providers and other competitors in the high speed data market are almost exclusively dependent on the ILECs for the underlying access and transport facilities that are needed in order to provision their own high speed services. Indeed, in order to provision such a vast network of their own, independent ISPs must overcome a number of barriers to market entry. These barriers were recognized by the Commission in *Call-Net*

*Enterprises Inc. - Request to lift restrictions on the provision of retail digital subscriber line Internet services*, Telecom Decision CRTC 2003-49 (Decision 2003-49). Specifically, the Commission noted that new entrants in the market faced both financial barriers and technological barriers to market entry:

The Commission notes the ILECs' position that competition in the PES market is not being unduly impaired since Call-Net can pursue a number of options to provide its PES customers with retail DSL IS. The ILECs submitted that such options include co-locating DSL equipment at the ILECs' central offices and using the ILECs' DSL access tariffs. The Commission considers, however, that competitive DSL IS providers, such as Call-Net, **face barriers to enter the DSL IS market as a result of collocation costs, transport costs, and the margins available when providing retail residential DSL IS. In addition, the ILECs' increasing deployment of fiber electronics at remotes makes it more difficult for competitors to expand their networks.**<sup>139</sup>

29. There is a common misperception, which many parties appear to hold, regarding the availability of alternatives sources of supply to the ILECs' wholesale ADSL access services. In particular, certain parties to this proceeding assert that the cable companies' third party Internet access (TPIA) service can be used as a substitute for the ILECs' wholesale ADSL service.<sup>140</sup>
30. This is a highly flawed argument. The record of this proceeding makes it clear that the cable companies' networks are not capable of serving as a meaningful or adequate substitute to the ILECs' wholesale ADSL services in both business and residential markets.<sup>141</sup> The following is a summary of the numerous problems associated with the cable companies' TPIA services:
  - As noted by several parties to this proceeding, the cable companies' networks do not cover the business customer market (both in urban cores and industrial parks) in any

---

<sup>139</sup> Decision 2003-49, paragraph 69, emphasis added.

<sup>140</sup> See, in particular, the 15 March 2007 Evidence of Bell *et al* and the Competition Bureau.

<sup>141</sup> The evidence, interrogatory responses and testimony of Primus/Globility, MTS Allstream, Xittel/QCISP and even the cable companies (Rogers and Shaw in particular) make it clear that TPIA is not substitutable for wholesale ADSL access services.

meaningful fashion. Accordingly, TPIA cannot be used as an alternative to wholesale ADSL services in these areas of the country.

- Even with respect to those portions of the cable companies networks' that extend to the business customer market segment, TPIA is not a realistic means of providing a reliable and secure high speed access service to these customers. Business and enterprise customers require a dedicated and secure access solution. The cable companies do not provide fixed or "static" IP addresses with their TPIA service – something which is an absolute prerequisite for business customers. Specifically, because business customers often have their own internal networks (e.g., multiple computers, firewalls, different locations, etc), they use IP addresses to manage that network. Many cable companies will use static IP addresses for certain nodes within their networks, but when they split those nodes (which they have to do because of the way their networks are designed), they have to change the IP addresses for users on their networks. The result is that it is next to impossible for business customers to manage their own IP addresses within a cable company network.
- Since ISPs also use IP addresses to manage the services that they provide to their customers, this problem exists for ISPs as well. In fact, it is one of the principle reasons why the cable companies' TPIA services cannot even be used by ISPs to provide reliable Internet services to residential customers.
- The other reason why TPIA service is not an adequate substitute for the ILECs' wholesale ADSL services, even for residential customers, is because the cable companies' TPIA services do not provide ISPs with dedicated channels or bandwidth within the cable companies' networks. This problem, when combined with the inability of ISPs to use or obtain static IP addresses within the cable companies' networks, means that ISPs cannot properly manage the services that they provide to their end-user customers, regardless of whether those customers are business customers or residential customers.
- It should also be noted that, unlike the ILECs whose networks cover entire provinces, the cable industry is still a relatively fractionalized industry sector with a patchwork of networks around the country. Indeed, there are hundreds of small cable companies in

Canada that do not have TPIA tariffs and are currently not mandated to provide this service. Needless to say, TPIA is not a substitute for wholesale ADSL services in these areas of the country (to the extent, of course, that it can even be said to be a substitute for the ILECs' wholesale ADSL services in the first place).

- Finally, it should be noted that the cable companies' TPIA services are not provided on an unbundled basis. It is not possible, for example, to obtain unbundled local loops from the cable companies, nor is it possible to gain access to other portions of their networks through their TPIA tariffs. Instead, ISPs must connect to the TPIA service at the cable head end (or, more likely, multiple cable head ends) in order to gain access to a single customer. In this regard, it might be more appropriate to characterize TPIA service as an interconnection service than a high speed local access and transport service.
31. Given the numerous limitations associated with the cable companies' TPIA service, CAIP does not believe that this service represents a practical or meaningful substitute to the ILECs' wholesale ADSL services. It is a service that is based on first generation technology which will require many more technical advancements before it can be used by ISPs to provide reliable and secure high speed Internet access service to residential and business customers.
  32. For these reasons, CAIP has classified the cable companies' TPIA service as a "conditional mandated non-essential" wholesale service (basket #4 of Commission Exhibit #4). While CAIP does not rule out the possibility that this service might, one day, be capable of substitution with the ILECs' wholesale ADSL services, it is nowhere near this technical stage of development at the present time. However, recognizing that there may be a few ISPs that might use this service in certain limited instances, CAIP does not believe that the cable companies' TPIA service should be de-tariffed. The Commission should continue to mandate the tariffing of this service in order to ensure continuity of TPIA service to those ISPs who currently make use of this service.
  33. As for the classification of the ILECs' wholesale ADSL access services, in CAIP's view, there is no question that these services are essential. The ILECs' wholesale ADSL services are in extremely limited supply because they are provided almost exclusively or predominantly by a single supplier (i.e., the ILECs). CAIP also notes that these services

cannot feasibly be economically or technically substituted in any meaningfully short period of time as the Commission itself has recognized in Decision 2003-49. Finally, CAIP notes that these services are a critical input required by competitors to provision high speed Internet access services to the residential and small business customer market.

34. With respect to the argument that ISPs can co-locate their own DSLAM equipment in the ILECs' central offices as an alternative to using the ILECs' wholesale ADSL services, CAIP notes that co-location could be used as an alternative in certain instances where it is justified by a business case; however, the Commission itself has recognized that collocation costs represent a barrier to entry for providers of high speed Internet access services, as do transport costs, and the margins available to ISPs when they provide high speed Internet access services to residential customers.<sup>142</sup>
35. Furthermore, it is not possible to co-locate at ILEC remotes at the present time and this would be a necessary requirement in order for independent ISPs to gain access to the customers that are served off these facilities. Indeed, as many parties are aware, xDSL services, including ADSL services, require copper continuity in order to create a high speed connection between the customer's premises and an ISP's POP. Since the ILECs' remotes are connected to their host switches via fiber fed facilities, the only way to gain access to the copper loops that are connected to the end-customer's premises is to co-locate at the ILECs' remotes. However, under the current regulatory regime, this is not possible, nor arguably would be technically feasible in the vast majority of instances since there is very little extra space at ILEC remotes which could accommodate the DSLAM equipment of competitors.
36. This problem of fiber fed remotes has been recognized by the Commission as a further barrier to entry into the market for competitors seeking to provision their own ADSL services. As noted by the Commission in Decision 2003-49, "the ILECs' increasing deployment of fiber electronics at remotes makes it more difficult for competitors to expand their networks."<sup>143</sup>

---

<sup>142</sup> Decision 2003-49, paragraph 69.

<sup>143</sup> Ibid, paragraph 69.

## **APPENDIX II. TABLE OF INDIVIDUAL PUBLIC COMMENTS**

As of the date of CAIP's Reply, approximately 1361 individual Canadians have written in to the Commission to voice their concerns regarding Bell's wholesale traffic shaping and to express their support for CAIP's application.

The majority of these individual submissions were submitted in the following or similar form:

I am writing to express my support for the Application that CAIP has filed with the CRTC regarding Bell Canada's throttling practices. I believe that these practices contravene Bell Canada's duties as a common carrier and that the Commission should direct Bell to immediately cease and desist from throttling the traffic of independent ISPs.

However, in addition to the foregoing, approximately 1361 Canadians wrote in to elaborate on the impacts that they have experienced as a result of Bell's traffic shaping measures as well as to voice their concerns regarding the implications on the Canadian telecommunications landscape in the longer term.

CAIP has reviewed each and every one of the submissions of individual Canadians as of 22 July 2008. Having done so, CAIP has catalogued and hyperlinked below the unique submissions of individual Canadians in accordance with the principal concerns expressed therein. While individual submissions often touched on more than one area of concern or impact, the catalogue below is meant to serve as a tool to understand the perspective of individual Canadians on the issues raised in CAIP's Application.

### **Impact on Competition/Concerns regarding Anti-Competitive Conduct**

Brad Barnett, 12 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/896976.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/896976.HTML)

Marc Bissonnette, 9 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/890631.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/890631.HTML)

Jeremiah Bourque, 24 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903446.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903446.HTML)

Stuart Brook, 10 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/891669.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/891669.HTML)

Cal Bruner, 25 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903886.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903886.HTML)

Gary Cameron, 2 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/901938.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/901938.HTML)

Marcus Coles, 9 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/890614.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/890614.HTML)

R Davidson, 10 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/891480.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/891480.HTML)

Pierre Denis, 19 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/898844.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/898844.HTML)

Theo de Raadt, 22 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/902621.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/902621.HTML)

Mark Deutsch, 11 June 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/918435.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/918435.HTML)

Sanjeet Dhillon, 22 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/902626.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/902626.HTML)

Keith Duguay, 10 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/895934.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/895934.HTML)

Roberto Garcia, 10 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/895584.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/895584.HTML)

Jay Goldberg, 22 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/902550.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/902550.HTML)

Christopher Hanlon, 9 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/891068.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/891068.HTML)

Bob Henry, 10 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/891539.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/891539.HTML)

Dylan Herbert, 12 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/896868.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/896868.HTML)

Kevin Jackson, 10 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/894484.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/894484.HTML)

### **Negative Impact on Innovation**

Scott Allison, 10 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/891673.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/891673.HTML)

Mr. Robert A. Morin  
July 23, 2008

Appendix II  
Page 3 of 5

Arnon Clark, 10 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/894749.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/894749.HTML)

**Effects on VPN/remote access data transfer**

Bruce Ritchie, 18 June 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/920289.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/920289.HTML)

Jeff Bartlett, 30 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/904121.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/904121.HTML)

Dave Bennett, 5 May 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/904397.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/904397.HTML)

Robert Brown, 11 June 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/918416.html](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/918416.html)

Ronan Brunner, 5 May 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/904574.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/904574.HTML)

Guillaume Caumartin-Plante, 25 June 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/921020.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/921020.HTML)

Matthew Cousens, 24 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903496.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903496.HTML)

A Deen, 23 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903245.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903245.HTML)

Theo de Raadt, 22 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/902621.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/902621.HTML)

Dave Duchaine, 13 May 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/905150.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/905150.HTML)

Mark Dynes, 10 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/891538.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/891538.HTML)

Paul Feenstra, 10 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/894356.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/894356.HTML)

Brian Fetter, 24 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903875.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903875.HTML)

Ryan Field, 15 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/898034.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/898034.HTML)

John Garndof, 24 April 2008  
[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903583.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903583.HTML)

Filippo Grego, 22 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903179.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903179.HTML)

Dan Saddy, 24 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903528.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903528.HTML)

Saturnin Kepa, 5 May 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/904918.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/904918.HTML)

Albert J. Kirshen, MD, MSc, FRCPC, FACP, 17 June 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/920269.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/920269.HTML)

### **Effects on P2P/Torrent data transfer**

Yves Chauvin, 11 June 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/918423.html](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/918423.html)

Kim Connors, 22 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903028.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903028.HTML)

Donald Cornelius, 27 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/904006.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/904006.HTML)

Ron Crane, 23 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903375.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903375.HTML)

Alain Ducharme, 11 June 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/918441.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/918441.HTML)

Rich Emrich, 11 June 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/918413.html](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/918413.html)

Paul Feenstra, 10 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153/894356.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153/894356.HTML)

Jason Koblovsky, 23 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903403.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903403.HTML)

### **Effects on VOIP**

Chris Dale, 4 May 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/904909.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/904909.HTML)

Jeremy Howell, 25 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903880.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903880.HTML)

Tiago Jorge, 14 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/897870.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/897870.HTML)

Miro Jurak, 25 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903969.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903969.HTML)

Mr. Robert A. Morin  
July 23, 2008

Appendix II  
Page 5 of 5

Steve Kasm, 1 May 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/904128.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/904128.HTML)

Effects on other kinds of data transfer and internet use

Lesley Brown, 11 June 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/918425.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/918425.HTML)

Richard Gaspari, 12 June 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/920247.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/920247.HTML)

Benjamin PK Hermiston, 24 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903485.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903485.HTML)

Ron Knull, 18 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/898951.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/898951.HTML)

### **Privacy**

Jonathan Black, 11 June 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/918420.html](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/918420.html)

Mathew Brown, 22 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903041.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903041.HTML)

Frederic Defoy, 18 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/898562.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/898562.HTML)

Pascal Dubé, 24 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903965.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903965.HTML)

Alain Goyette, 22 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/902510.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/902510.HTML)

Tony Kao, 23 April 2008

[http://www.crtc.gc.ca/public/partvii/2008/8622/c51\\_200805153\\_1/903369.HTML](http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/903369.HTML)