Summary of January 13, 2009 CRTC Filings by Major ISPs in Response to Interrogatory PN 2008-19 with February 9, 2009 Updates

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Summary: This document gathers together responses to the CRTC interrogatory questions contained in PN 2008-19. Personal thoughts and comments have been left out of this document, as have any analyses. Where fields are blank, this is because no response was filed or given. When references in black text are made to filing documents for particular Internet Service Providers (ISPs), they are to the documents that the ISP released on January 19 and 20, 2009. Statements and references in blue indicate that data is from ISPs' February 9, 2009 updates.

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Network Traffic Characteristics

Q.1 With respect to the networks[1] your company uses to provide broadband Internet services[2]:

a) Describe in detail how traffic volume on these networks has changed from 2006 to 2008. Provide specific traffic data by month for each year.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: all data filed in confidence Bell Alliant Atlantic: most data requested is unavailable due to insufficient equipment to provide Commission with requested data. Data used to provide information about growth filed in confidence. Bell Mobility: Most data requested unavailable regarding the Bell Mobility network. All data filed in confidence, though descriptively says that growth has 'exploded'. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Cogeco Cable Canada Inc.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
MTS Allstream Inc.	Traffic volumes filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Rogers Cable Communications Inc	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Saskatchewan Telecommunications	Measured on basis of links connecting to external Internet traffic, with the volumes of data having risen 'considerably' over the past 5 years. Data identifying actual traffic volumes have been filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Primus Telecommunications Canada Inc.	Data supplied from April 1, 2008. Reliable information prior to this is not available. There has been a 50% increase in traffic over this period of time due to factors including increased customer downloading. Actual data filed in confidence
Shaw Communications Inc	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Barrett Xplore Inc	Does not have monthly traffic volume for 2006-2008 period across its entire network. Growth and numbers filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
TELUS Communications Company	Substantial (305%) growth in inbound traffic, large (155%) growth of outbound traffic (data measured against in and out at backbone). Mobile wireless up 414% inbound and 281% outbound. Required to file some data anonymously for subsequent compilation and release by the CRTC.

1 If your company operates more than one network (such as a wireless network and a fixed network), questions are to be answered for each network used to deliver broadband Internet services.

2 For the purposes of this proceeding, the Commission is considering the term 'broadband Internet services' to refer to any Internet access services not offered over a dial-up connection.

Videotron Ltd.	Files in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Bragg Communications Inc.	Data filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.

b) For the traffic on these networks, provide the percent composition of various types of Internet traffic (e.g. HTTP, P2P, UDP, etc.) for each year from 2006 to 2008 by month.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: Largely filed in confidence. This said, there is a notation that between 1630 and 0200 each day P2P traffic is shaped using DPI technologies. Bell Mobility: Most data requested unavailable regarding the Bell Mobility network. All data filed in confidence, though descriptively says that growth has 'exploded'. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Cogeco Cable Canada Inc.	Does not track this on a systemic basis and thus cannot provide data requested
MTS Allstream Inc.	Has not deployed equipment that can monitor and track the distribution and composition of traffic types
Rogers Cable Communications Inc	While lacks graphs outlining composition, suggests that the capacity for filesharing programs to mask their packets makes any comprehensive analysis of p2p-like traffic challenging to calculate. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Saskatchewan Telecommunications	Only retains 52 weeks of aggregate data. Current monitoring does not differentiate by 'type' (e.g. HTTP, P2P) but by IP usage and TCP ports accessed. Does not have month-by-month analysis for traffic type usage.
Primus Telecommunications Canada Inc.	Primus cannot provide the composition of data types of Internet traffic on the network. It does not monitor this traffic.
Shaw Communications Inc	Data only available for the past 18 months. Data filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Barrett Xplore Inc	Only has test data since June 16. Data collected has been filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
TELUS Communications Company	Does not track traffic so granularly. Rough identification is as follows: Web (HTTP, HTTPS) 76.64%; Steaming media (Flash, MS, RTSP) 5.30%; Gaming (Xbox, WoW) 3.17%; P2P (gnutella, bittorent) 3.08%; Undefined (port 0 – fragmented or IPSec) 2.79%; Usenet news (NNTP, NNTPS) 1.81%; Mail (POP) 0.12%. Must be noted that P2P number low because of its ability to 'hide' as HTTP/HTTPS. TELUS cannot differentiate between particular applications flowing through ports.
Videotron Ltd.	Data not available.
Bragg Communications Inc.	Long-term data storage is not performed. Data for August through December 2008 is filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.

c) What is your definition of peak period(s) on these networks? Has this peak period changed in the years from 2006 to 2008? If so, describe this change.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: Established peak times using data filed in confidence as between 1630 and 0200 each day. Bell Mobility: Does not currently have a defined 'peak period' for its data traffic.
Cogeco Cable Canada Inc.	Peak period is 6pm -12am; has not changed significantly over past two years
MTS Allstream Inc.	Two peaks: 1200-1600 (CST – Enterprise division and out of province customers); 2000-2200 (CST). Data filed in confidence.
Rogers Cable Communications Inc	Define network peak based on a 95th percentile calculation (remained same for several years). Traffic roughly same for the period from 6pm – 12am each day
Saskatchewan Telecommunications	Any traffic that reaches 95% of capacity at particular link raises alert that is brought to the attention of the Internet Protocol Contol Office. Daily peak periods have maintained a consistent usage pattern over between 2006-2008. Largest peak time is from 2000 – 0000 CSP. Bandwidth peak usage is lowest between 0400 and 0600CST. Yearly, peak traffic is in the months of November and December.
Primus Telecommunications Canada Inc.	Peak is between 1830 and 0030. Peak did not change between April 2008 and December 2008
Shaw Communications Inc	16:00-2:00; peak hours have not changed though volume of traffic in these periods has increased.
Barrett Xplore Inc	6pm-12am on weekends, and 11am-12pm on weekdays. Data filed in confidence.
TELUS Communications Company	High use times on weekdays are between 3:30pm and midnight, with highest levels at 9:30pm Alberta time/8:30 BC
Videotron Ltd.	Peak periods have not changed, but are filed in confidence.
Bragg Communications Inc.	6:00pm-11pm; these periods have remained consistent since 2006

d) Provide a forecast indicating how you expect the traffic volumes on your networks to change in the years from 2009 to 2011. You answer should include a discussion as to why these changes are forecasted.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: all data filed in confidence Bell Alliant Atlantic: most data requested is unavailable due to insufficient equipment to provide Commission with requested data. Data used to provide information about growth filed in confidence. Bell Mobility: Most data requested unavailable regarding the Bell Mobility network. All data filed in confidence, though descriptively says that growth has 'exploded'.
Cogeco Cable Canada Inc.	Traffic on its own network expected to double by 2011. Data to derive this filed in confidence. Cannot provide data on upstream traffic volume because reviewing its own traffic management rules. Expects growth from new 'net applications, rather than linear development, making predictions challenging and contingent.
MTS Allstream Inc.	Filed in confidence.
Rogers Cable Communications Inc	For confidentiality reasons, have not provided numbers though does indicate that growth has decreased as a result of applying usage caps
Saskatchewan Telecommunications	Data of growth filed in attachment 3 (filed in confidence). Reasons for growth attributed to larger number of total end-users (wired and wireless), ISP competition has led to the provision of higher bandwidth available to customers, availability, type, and quality of content on the 'net. See growth of on-demand video content as likely, and have identified that there is major usage of social networking sites (e.g. facebook).
Primus Telecommunications Canada Inc.	Actual traffic growth data filed in confidence. Expected increases due to demands for bandwidth for intensive applications such as file sharing, customers accessing music and video content, steaming media websites, and online gaming
Shaw Communications Inc	Forecasted growth filed in confidence, though is apparently in alignment with Cisco IP Traffic forecast whitepaper (increase of 403% since 2008)
Barrett Xplore Inc	Data filed in confidence.
TELUS Communications Company	Filed in confidence
Videotron Ltd.	Downloading will evolve faster than uploading in 2009-2011, mostly because of video content and because users can better control their upstream usage. Percentages of expected growth are filed in confidence.
Bragg Communications Inc.	Forecast filed in confidence

Network Traffic Characteristics

Q.2 With respect to the Internet traffic currently consumed by end-users of your broadband Internet service(s):

a) What is the monthly average usage per end-user in Gigabytes (Gb) by month for each year from 2006 to 2008? Provide a breakdown of the upstream and downstream traffic usage separately.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: Specific data points filed in confidence. This said, top 5% usage of network has declined from 61.1% to 46.6% of network, and top 10% from 77.1% of network use to 62.6%. Bell Aliant Atlantic: Does not have monthly data by end-user, or breakdown by upstream and downstream usage. All data supplied filed in confidence. Bell Mobility: Notes that limited data available, and that given the divergence of data needs of mobile users that it is challenging, if not impossible, to establish meaningful consumer profiles. All data that is provided is done so in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Cogeco Cable Canada Inc.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
MTS Allstream Inc.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Rogers Cable Communications Inc	Not disclosed for confidentiality reasons. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Saskatchewan Telecommunications	Traffic usage per end-user is not measured on either fixed wireline or fixed wireless networks. Information for cellular use is not readily available in the format requested. Information for cell network only available from May 2008 onward. Important to note that despite marketing information, traffic usage by month per end-user outside of Saskatchewan for fixed wireline broadband Internet access services is not measured for billing purposes. Those not using DSL services is measured when outside of province. Given lack of information available, SaskTel does not think that its information will contribute much to the proceeding. Data has been filed in confidence.
Primus Telecommunications Canada Inc.	Data filed in confidence from April 2008 to December 2008.
Shaw Communications Inc	Does not retain historical monthly data of this type for more than one year. Data filed in confidence.
Barrett Xplore Inc	Does not have monthly data for relevant period. Data submitted filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.

TELUS Communications Company	Partially provided (only give a percentage of use, rather than total use). No data April 2007. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Videotron Ltd.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Bragg Communications Inc.	Data filed in confidence

b) What is the monthly average usage for the top i) 5% and ii) 10% of end-users consuming the greatest amount of Internet traffic on your networks in Gb by month for each year from 2006 to 2008? Provide a breakdown of the upstream and downstream traffic usage separately.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: Specific data points filed in confidence. This said, top 5% usage of network has declined from 61.1% to 46.6% of network, and top 10% from 77.1% of network use to 62.6%. Bell Aliant Atlantic: Data for monthly average usage by the top 5% and top 10% of end-users is not available. Bell Mobility: Cannot provide information requested. Reasons for this are filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Cogeco Cable Canada Inc.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
MTS Allstream Inc.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Rogers Cable Communications Inc	Not disclosed for confidentiality reasons. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Saskatchewan Telecommunications	Given lack of information available, SaskTel does not think that its information will contribute much to the proceeding. Data has been filed in confidence.
Primus Telecommunications Canada Inc.	Cannot provide data prior to July 2008, and can only provide breakdown for the month of July. More data is forthcoming. Data is filed in confidence.
Shaw Communications Inc	Does not retain data type for more than one year. Data filed in confidence.
Barrett Xplore Inc	Filed in confidence.
TELUS Communications Company	Partially provided (only give a percentage of use, rather than total use). No data April 2007. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Videotron Ltd.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Bragg Communications Inc.	Data filed in confidence

c) What proportion of the total traffic on your networks do each of the two end-user categories identified in (b) above represent?

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: Specific data points filed in confidence. This said, top 5% usage of network has declined from 61.1% to 46.6% of network, and top 10% from 77.1% of network use to 62.6%. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Cogeco Cable Canada Inc.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
MTS Allstream Inc.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Rogers Cable Communications Inc	Not provided for confidentiality reasons. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Saskatchewan Telecommunications	Cannot determine the proportion of the total traffic on its networks for each of the four end-user categories given that those with traffic usage billing share a network with customers whose usage is not measured.
Primus Telecommunications Canada Inc.	Data filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Shaw Communications Inc	Does not retain data type for more than one year. Data filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Barrett Xplore Inc	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
TELUS Communications Company	Partially provided (only give a percentage of use, rather than total use). No data for April 2007. Note: % of total in both cases have *decreased* since January 2006. Less content being uploaded, more being downloaded. This true for consumer data as well. Business data shows an *increase* in data uploaded *and* downloaded. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Videotron Ltd.	Filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Bragg Communications Inc.	Data filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.

d) What applications do each of the two end-user categories identified in (b) above utilize that contribute most to their usage? For these applications, specify the percent composition of the total usage for each of the two end-user categories in (b).

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: HTTP/streaming and P2P traffic are the most commonly utilized end-user categories that contribute to bandwidth usage. All data filed in confidence. Bell Aliant Atlantic: Data for monthly average usage by the top 5% and top 10% of end-users is not available. Bell Mobility: Cannot provide information requested. Reasons for this are filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Cogeco Cable Canada Inc.	Does not track this information.
MTS Allstream Inc.	Does not implement traffic monitoring measures necessary to monitor or track this information.
Rogers Cable Communications Inc	Do not provide this data, on the basis that they do not track it
Saskatchewan Telecommunications	Does not measure its customers' usage by applications.
Primus Telecommunications Canada Inc.	Has no information on the applications used by end-users
Shaw Communications Inc	Does not retain data type for more than one year. Data filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.
Barrett Xplore Inc	Does not currently have the ability to isolate groups of customers and track their usage rates of applications.
TELUS Communications Company	Does not have this information.
Videotron Ltd.	Information is unavailable.
Bragg Communications Inc.	Data filed in confidence. Required to file some data anonymously for subsequent compilation and release by the CRTC.

e) Provide a forecast indicating how you expect the monthly average usage per end-user (in Gb) to change in the years from 2009 to 2011.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: Specific data points filed in confidence. This said, top 5% usage of network has declined from 61.1% to 46.6% of network, and top 10% from 77.1% of network use to 62.6%. Bell Aliant Atlantic: Does not have monthly data by end-user, or breakdown by upstream and downstream usage. All data supplied filed in confidence. Bell Mobility: Does no collect average usage per end-user information on its network and so cannot provide the information requested.
Cogeco Cable Canada Inc.	Cannot provide upstream data (reviewing traffic management policies). Downstream data information filed in confidence.
MTS Allstream Inc.	Filed in confidence
Rogers Cable Communications Inc	All forecasting performed based on peak network data – as a result answer 1d (would) offer this information.
Saskatchewan Telecommunications	Does not forecast monthly averages per end-user
Primus Telecommunications Canada Inc.	Data filed in confidence
Shaw Communications Inc	Data filed in confidence.
Barrett Xplore Inc	Filed in confidence.
TELUS Communications Company	Filed in confidence
Videotron Ltd.	Filed in confidence.
Bragg Communications Inc.	Data filed in confidence

Network Congestion and Provisioning Practices

Q.3 How do you define congestion in the networks your company uses to provide broadband Internet services? What criteria and measurements are used to determine that there is congestion in your networks? If you provide both retail and wholesale services, provide any differences in how you define congestion for each.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Aliant Atlantic: Congestion implies that user demand is greater than the network's capacity to effectively handle that demand; when capacity is exceeded, packets are delayed before being delivered or dropped. The impact is slower traffic delivery, which may prevent end-users from receiving data at all. Level of utilization at links is core means of evaluating where (and when) congestion occurs. Threshold for congestion not released, but it is noted that it is below 100%, and that link utilization measurements take place every 5-15 minutes. Bell Wireline's congestion criteria has shifted over time, but the data to identify how has been filed in confidence. All supporting data surrounding this question have been filed in confidence. Bell Mobility: Congestion would be a peak traffic load that can be carried in its network until any one element reaches full capacity. Examples of congestion include dropped called and blockage. This is more likely to happen on Radio Access Networks.
Cogeco Cable Canada Inc.	Specific data that is used to identify congestion filed in confidence – use a two part definition (based on % exceed capacity at peak time, congestion within its network when %/# of time is met). Two part system meant to identify and alleviate congestion within the DOCSIS access network. Measurements filed in confidence.
MTS Allstream Inc.	Defined by capacity use on the transport switch between network segments. SNMP is used to measure capacity utilization. Congestion defined as "the existence on a specific node, network segment or link of peak capacity utilization rates at or beyond threshold levels at which service quality impairment is imminent or has occurred. The service quality impairment that can arise in this respect can include queuing delays, packet loss and/or reduction in network throughput." Number used to identify threshold filed in confidence, though noted that it can practically be higher or lower based on capacity of particular segments of network; timeframe required to update node; expected rate of traffic growth on network segment/link; ability to balance loads using alternate routes; interface types and technology considerations. Uses a four colour code system to identify capacity utilization and congestion problems. Capacity is measured, and growth calculated, based on all types of data traffic (VoIP, web browsing, etc).

Rogers Cable Communications Inc	Clear definition of congestion not offered. Rather, when thresholds that indicate data traffic performance degradation are met is congestion occurring. SNMP is used to evaluate network utilization. Monthly analyses of SNMP reports performed, which results in alterations/upgrades to network regions. Process has remained constant since 2006.
Saskatchewan Telecommunications	Monitored and tracked on major aggregation elements in every geographical district, where congestion would be first to manifest. Uses SNMP traps and network management tools. Only where network elements achieve a sustained 100% peak for over 5 minutes is that element identified as running at full capacity. Details on what would, and would not, be a serious congestion issue filed in confidence. Proactive thresholds that would lead to proactive prevention of network utilization filed in confidence. Shared network resources, such as DSLAM connections to Access Aggregation switches, are also monitored for utilization. Criteria applies to both retail and wholesale customers.
Primus Telecommunications Canada Inc.	Congestion occurs when utilization reaches a peak in excess of ???? of the available bandwidth of a link. Does not provide wholesale services.
Shaw Communications Inc	Defined as "the instance when the network slows to the point of impacting the customer experience. This results in the customer not being able to reach the maximum download and upload speeds as advertised for their Internet product." Conditions for identifying when congestion occurs on network filed in confidence, though appears to need to occur on a particular link for a confidential number of days. The same congestion definition is applied to retail and wholesale customers.
Barrett Xplore Inc	Congestion defined as "that point when customer loading or traffic volumes exceed design parameters." Uses following criteria to assess congestion: (a) where # of users exceed ??% of design capacity; (b) any network link where peak traffic volume exceeds ??% of available capacity; (c) any Internet transit connection where peak traffic volume exceeds ??% of available capacity. Uses Network Management System (type undefined) to monitor, continuously, network elements for congestion. All data filed in confidence.
TELUS Communications Company	"Congestion occurs when packets are lost or delayed due to lack of network resources." Monitors packet loss on per-interface basis. Congestion same between business and wholesale services, but Service Level Agreements specify min/max acceptable values for packet loss and latency. These do not exist in the case of consumer Internet access.
Videotron Ltd.	Congestion is defined as REDACTED, but policies do not vary whether this is an end-user or a reseller/wholesaler of Videotron's services.
Bragg Communications Inc.	Congestion "defined as being evident where link utilization exceeds the effective throughput capabilities of the network facility which negatively impacts customer experience. Network congestion can be in either the upstream or downstream direction. Definition applied to both retail and wholesale customers.

Network Congestion and Provisioning Practices

Q.4 Have your congestion criteria changed between 2006 and 2008? If so, explain how they have changed.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Aliant in Ontario and Quebec: Yes, how was filed in confidence in response to question 3. Bell Aliant Atlantic: No
Cogeco Cable Canada Inc.	No.
MTS Allstream Inc.	No.
Rogers Cable Communications Inc	No.
Saskatchewan Telecommunications	No, have not changed in last 3 years
Primus Telecommunications Canada Inc.	No
Shaw Communications Inc	No
Barrett Xplore Inc	Criteria have changed based on capacities of new technology deployed in network. Not stated *where* that technology has been deployed in the network.
TELUS Communications Company	No.
Videotron Ltd.	No.
Bragg Communications Inc.	Criteria been in effect in 2005. Baseline targets for what is an acceptable level of congestion are continuously reviewed.

Network Congestion and Provisioning Practices

Q.5 Describe which components (e.g. network elements or links) of your networks, used to provide broadband Internet services, are provisioned based on Internet traffic volumes. The discussion should include a general description of the architecture of your networks.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Aliant Atlantic: Graphic and explanations of data movement provided. Segments include: (i) DSLAM uplinks; (ii) Aggregation network links; (iii) Aggregation network switches; (iv) Broadband access servers; (v) Backbone network IP routers; (vi) Backbone network links Bell Mobility: Graphic and description of elements of network provided. Components that are provisioned based on Internet traffic volumes are: (i) RAN; (ii) BSC/CPDS; (iii) DO RNC; (iv) FA-PDSN; (v) HA; (vi) Backbone network IP routers; (vii) Backbone network links
Cogeco Cable Canada Inc.	Graphic is provided, as are abstract notation of network components. Particular components have been filed in confidence. DPI is used.
MTS Allstream Inc.	Three broad segments: (i) aggregation links within regional IP network in Manitoba; (ii) Tier 1 links connections regional and national IP core networks; (iii) peering links connecting national IP core network with public Internet and private, IP-based, networks. Aggregation links tracked using SNMP pooling. Tier 1 link thresholds tracked using SNMP. Peering links tracked using SNMP. All polling times and capacity upgrade information filed in confidence. Save for peering links and DSLAMS there are no major network elements in an IP-based telecommunications network that are provisioned exclusively on the basis of Internet traffic volumes.
Rogers Cable Communications Inc	All facets are monitored, and provisioned accordingly. The general description can be found in Rogers(CRTC)4Dec08-3, A paragraph 4.
Saskatchewan Telecommunications	Graphic and explanatory paragraphs contained. Details on what elements of network connect to native and foreign networking elements. All 'net traffic is treated as best effort.
Primus Telecommunications Canada Inc.	Primus uses two different platforms to provision their wireline services. The first is with Globility (a CLEC) through which local, long distance, and Internet service is bundled. Links are filed in confidence. The second is the wholesale aggregated high seed Internet access services of the ILECs. ADSL is noted as one link under Primus' control, others are filed in confidence. Primus uses two platforms to provision their Internet service: (1) a partnership with Globility (a CLEC) "through which Primus retails a bundle of local, long distance and Internet services"; (2) links on the Central Office-based platform, which include: DSLAM t ATM equipment links within the Central Office; Central Office to Hub links; Hub to Primus Point of Presence links; Point of Presence to Broadband Remote Access

	Server links; Broadband Remote Access Server to Internet transit links
Shaw Communications Inc	Divided in three network segments; Hybrid Fibre-Coaxial Plant; the Metro area Network; Wide Area Network. Diagram showing where three network segments are deployed in relation to various network devices filed in confidence. Six devices on network include: (a) cable modem; (b) cable modem termination system router; (c) traffic management switch; (d) packet switch; (e) transport mux; (f) IP backbone router. They have provided the diagram for their network in the February 9, 2009 filing
Barrett Xplore Inc	Diagrams on the wired and satellite networks available in the February 9,2009 filing
TELUS Communications Company	Broken into four segments: (1) access network; (2) aggregation network; (3) core backbone network; (4) Internet gateway network. Provision and management based on traffic volumes.
Videotron Ltd.	Videotron's hybrid cable and fibre network is composed of three elements: Internet links to the outside world, a federating network, and DOCSIS canals serving one or more cells, each cell corresponding to a certain quantity of users. All these resources are shared.
Bragg Communications Inc.	Notes that areas impacted by increased traffic volume include: Cable RF Plant; Head End Equipment (combiners, lasers, splitters); RF Spectrum; Cable Modem Termination System (CMTS); GE Links from CMTS to Advances Services Router (ASR); GE or 10GE links from ASR to Border Router (BR); DWDM transport network support ASR to BR WAN links; Internet Transit Facilities

Network Congestion and Provisioning Practices

Q.6 For each component identified in (5), describe the practices that you employ to provision your networks. Your answer should include a description of the conditions under which your company would augment its network capacities to address congestion. Describe in detail the process used to identify when and where additional network capacity is required and how the additional capacity requirements are determined.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Aliant Atlantic: Regular monitoring of all elements on the network occurs, though thresholds and utilization numbers that lead to further provisioning are filed in confidence. Bell Mobility: Regular monitoring of all elements on the network takes place, and when threshold levels are met consistently further provisioning occurs. The specifics of threshold numbers are filed in confidence.
Cogeco Cable Canada Inc.	Capacity addition thresholds filed in confidence, though corrective actions for each component are noted.
MTS Allstream Inc.	Refers to MTS Allstream(CRTC)04 and 05.
Rogers Cable Communications Inc	Augments occur on the basis of monthly aggregation of SNMP data.
Saskatchewan Telecommunications	Largely filed in confidence. Augmentation is determined on a case-by-case basis. Augmentation is provoked in response to threshold alarms.
Primus Telecommunications Canada Inc.	Links are mentioned in response to question 6 and are subject to the same guidelines as noted in response to question 3 (filed in confidence). Links are augmented when peak utilization crosses the ?????? threshold.
Shaw Communications Inc	Component details are filed in confidence
Barrett Xplore Inc	Wireless: Where BXI identifies a regular rate of consumers exceeding thresholds, and expects this to continue, increases network transit and backhaul capacity in the given network. Analysis performed using their network monitoring systems. Satellite: Challenging to bring in additional satellite capacity; instead when customer usage exceeds ??% of a beam's pre-determined capacity BXI stops adding new customers.
TELUS Communications Company	Polling performed (at least) hourly and reviewed on a bi-weekly basis. As part of review if congestion is occurring, network augmentation is almost certain to occur.
Videotron Ltd.	When congested: Outbound network – Videotron adds capacity REDACTED. Federating network – Videotron adds capacity REDACTED. Upstream DOCSIS canal – Videotron considers it congested when REDACTED. Downstream DOCSIS canal – REDACTED.
Bragg Communications Inc.	Filed in confidence

Network Congestion and Provisioning Practices

Q.7 Describe any major changes to your provisioning practices for the years 2006 to 2008. The response should include details on any changes in provisioning assumptions.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireless: Change in criteria monitoring, as filed in confidence in response to question 6. Other than this, there have been no changes to provisioning practices. Bell Aliant Atlantic: No major changes to its provisioning practices between 2006 and 2008. Bell Mobility: additional capacity was provisioned in 2008 in each RNC cluster (region) to provide redundancy on a chassis level. Other provisioning practices remain the same.
Cogeco Cable Canada Inc.	Remained same since 2006 to 2008.
MTS Allstream Inc.	Provisioning services have remained the same between 2006 and 2008
Rogers Cable Communications Inc	There have not been substantial changes in provisioning practices sing 2006.
Saskatchewan Telecommunications	There have been little or no changes in service provisioning practices. A trend towards symmetrical upsteam on asymmetrical downstream services has been noted. Is seeing a trend towards fewer customer accesses per Aggregation switch, limiting the potential impact of failure at this level.
Primus Telecommunications Canada Inc.	No major changes have been made between 2006 to 2008
Shaw Communications Inc	Traffic growth is mainly attributable to growth within its existing subscriber base, rather than new subscribers. Details on growth and provisioning filed in confidence
Barrett Xplore Inc	Network provisioning refers to carrying out engineering assessments and providing the elements necessary to match network capacities with demand, whereas customer provisioning refers to setting up the customer to receive the desired service packet.
TELUS Communications Company	Thresholds for augmentation review and action have increased.
Videotron Ltd.	Traffic shaping practices have not been changed between 2006-2008, thought specific solutions used to eliminate congestion have evolved. The specific solutions are filed in confidence.
Bragg Communications Inc.	Aside from increasing high speed service offering for most customers from 10Mbps to 15Mbps in 2007 there have been no major changes to provisioning practices over last two years

Q.8 If you utilize Internet traffic management technologies, such as deep packet inspection:

a) Identify the technologies that you use. Your answer should include the specific equipment that you are using by vendor and product name.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: DPI technologies are used, though vendor name and product type are filed in confidence. Bell Aliant Atlantic: does not currently utilize Internet traffic management technologies such as DPI Bell Mobility: does not currently utilize Internet traffic management technologies such as DPI
Cogeco Cable Canada Inc.	Has implemented DPI equipment, though vendor and product filed in confidence.
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used.
Rogers Cable Communications Inc	Filed in confidence.
Saskatchewan Telecommunications	Does not use Internet Traffic Management techniques. For security purposes, does use Arbor Peakflow SP product. Does not believe using this device for detecting, analyzing, and mitigating anomalies related to DDoS attacks, botnets, etc as the traffic management techniques Commission is interested in.
Primus Telecommunications Canada Inc.	Does not use traffic management technologies such as DPI or related types of management tools.
Shaw Communications Inc	Arbor-Ellacoya devices used for traffic management. Type(s) filed in confidence.
Barrett Xplore Inc	Uses VoIP prioritization, provisioning of modems, and Deep Packet Inspection. Beyond this, information filed in confidence.
TELUS Communications Company	TELUS does not currently utilize Internet traffic management technologies such as deep packet inspection.
Videotron Ltd.	Videotron does not use Internet traffic managing technologies, such as Deep Packet Inspection.
Bragg Communications Inc.	Filed in confidence

b) Explain why you chose to employ these Internet traffic management technologies. The response should address what conditions led you to implement these technologies and why you could not rely on non-technological solutions (e.g. provisioning practices).

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: While DPI was initially meant to introduce usage data collection for billing purposes, it was subsequently seen as necessary to use for traffic shaping purposes for P2P traffic. The response to question 9 identifies why non-technological solutions, such as provisioning practices, were not possible. Bell Aliant Atlantic: does not currently utilize Internet traffic management technologies such as DPI Bell Mobility: does not currently utilize Internet traffic management technologies such as DPI
Cogeco Cable Canada Inc.	In 2001 heavy P2P use led to policy decisions. Choice was between usage billing practices (not chosen because would have required extensive reworking of IT systems and DOCSIS was not then built to perform this billing type, nor were cable modem counters seen as effective/reliable. Still not considered an acceptable method given the latency between use and billing – would not dissuade 'abuses' of the network.) and traffic management approached (DOCSIS still limited to providing more downstream than upstream traffic. Has been a constant battle with P2P users who's applications strive to evade management. This has led to deployment of DPI.)
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used.
Rogers Cable Communications Inc	Use technologies to automatically manage traffic to reduce overhead costs and those to customers. Needed largely because of P2P; its use of multiple TCP connections unfairly gives P2P users more bandwidth than others; relies on drawing data from customers (last-mile) which is least efficient mode of transferring data; given that P2P places files for a world audience Rogers must use management to prevent their network from becoming the world's buffet. To keep up with P2P growth would raise costs to customers substantially.
Saskatchewan Telecommunications	Does not use Internet Traffic Management techniques. For security purposes, does use Arbor Peakflow SP product. Does not believe using this device for detecting, analyzing, and mitigating anomalies related to DDoS attacks, botnets, etc as the traffic management techniques Commission is interested in.
Primus Telecommunications Canada Inc.	Does not use traffic management technologies such as DPI or related types of management tools.
Shaw Communications Inc	Shaw used bandwidth caps prior to implementing the Arbor-Ellacoya devices in their network. These devices were deployed because Shaw realized that caps alone were insufficient to maintain capacity because upstream saturation was increasing more rapidly than new capacity could be added. Given that service use was uneven across the customer base service level provisioning was not helpful. P2P consumes all available

	upload capacity for users, which resulted in a small minority of customers accounting for a high portion of the used bandwidth and impacting overall customer experiences.
Barrett Xplore Inc	"Given the inability to materially alter the capacity of a satellite network, BXI believes network capacity must be managed to maintain the speed and quality of service received by its satellite customers"
TELUS Communications Company	TELUS does not currently utilize Internet traffic management technologies such as deep packet inspection.
Videotron Ltd.	Videotron does not use Internet traffic managing technologies, such as Deep Packet Inspection.
Bragg Communications Inc.	Choose to adopt internet management technologies so as to reduce the bandwidth demands from P2P. Also allows CSRs to assist customers who are unintentionally having their upstream access consumed by directing CSRs to internal troubleshooting page that allows them to check customers' current flows. Management technologies also enable Bragg Communications to gain insight into network trends. Usage caps were used in the past to address capacity issues, but customers responded poorly to them. On this basis traffic management technologies have been adopted.

c) Describe in detail how the implemented technologies carry out Internet traffic management. The response should include:

i) whether management is carried out at specific times of the day. If so, specify the times of day.

ii) whether management is carried out on specific end-users. If so, specify how you determine which end-users are included and why.

iii) whether management is carried out only under certain network conditions (e.g. congested states). If so, specify what those conditions are.

iv) whether management is carried out only on certain applications. If so, specify which applications are included, as well as why these applications have been chosen.

v) whether the technology processes packet information. If so, specify what information is inspected (such as the header or payload).

vi) whether any information is stored and retained. If so, specify for how long and for what purpose it is retained.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: (i) DPI is used to limit P2P traffic between the periods of 1630 and 0200, with different gradients of service provided in these periods; (ii)This affects retail and wholesale customers – individuals are not targeted specifically, save for when required by law enforcement; (iii) management occurs at peak times of day; (iv) P2P file sharing is targeting, though law enforcement could require a broader analysis of traffic; (v) packet flows are monitored, which entails correlating packet flows with particular signatures – this is intended to identify the application-type that is sending the data, as well as to identify information about popular packet exchanges (e.g. between customers and the New York Times). In the latter case, data is aggregated, rather than being associated to particular individuals; (vi) packet information that is stored (e.g. for traffic flow analysis) is aggregated and depersonalized so that customers' privacy is protected. **Note**: there is a 18 page discussion of DPI – reading this is valuable, as it outlines particular policies that Bell has in place. Bell Aliant Atlantic: does not currently utilize Internet traffic management technologies such as DPI Bell Mobility: does not currently utilize Internet traffic management technologies such as DPI
Cogeco Cable Canada Inc.	(i) not carried out at specific times of day; (ii) not carried out against particular users or destinations; (iii) not carried out to address particular network conditions; (iv) currently used again P2P: eDonkey/eMule, EmuleEncrypted, Kazaa, Fast Track KaZaA Networking, Napster, Bittorrent, Dijjer, Manolito, Hotline, Share, Soulseek, v-share, Zattoo, Joost, KuGoo, Kuro, DHT, Commercial File Sharing, Baidu Movie, Club Box,

	Winny, Gnitella, Gnutella Networking, WinMX, Direct Connect, PeerEnabler, Exosee, Further, Filetopia, Mute, NodeZilla, waste, Warez, NeoNet, PPLiveStream, PPstream Misc, BAIBAO, POCO, Entropy, Rodi, Guruguru, Pando, Soribada, Freenet, PacketiX, Feidian, AntsP2P, Sony Location Free, Thunder, Web Thunder; (v) traffic management equipment aims to ID only specific signature of P2P applications; (vi) retains categorized information for short period (specific filed in confidence). No content retained.
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used.
Rogers Cable Communications Inc	Only upstream P2P is managed. Same for all users, all the time, regardless of congestions. Their technology "looks at header information embedded in the payload and session establishment procedures." (note: DPI being used). Hold aggregated information to understand network usage patterns (in general) for indefinite periods of time.
Saskatchewan Telecommunications	Does not use Internet Traffic Management techniques. For security purposes, does use Arbor Peakflow SP product. Does not believe using this device for detecting, analyzing, and mitigating anomalies related to DDoS attacks, botnets, etc as the traffic management techniques Commission is interested in.
Primus Telecommunications Canada Inc.	Does not use traffic management technologies such as DPI or related types of management tools.
Shaw Communications Inc	Shaw uses Arbor-Ellacoya devices to monitor and report traffic flow, and this information is used to identify capacity abusers, forecast capacity requirements, and manage capacity consumption of non-customer interactive activities like P2P. These devices only read header information, and do not penetrate into the payload of packets. Information that is stored by Shaw is used for matters such as traffic management and forecasting. These devices do not block content, but does slow upstream paths, which results in P2P uploads taking longer, though the content itself is not interfered with. Rules apply 24/7, and affect both retail and wholesale customers. These rules have been applied to all end-users equally since 2003. The Arbor-Ellacoya devices are meant to ensure that customer interactive activities (e.g. VoIP, video streaming, web browsing) are given the higher priority to ensure customer satisfaction.
Barrett Xplore Inc	Service packages are assigned on a quota/hour system, with different quotas for peak and non-peak hours. If a customer exceeds their quota their maximum traffic speed is reduced. This is removed at the top of each hour. (i) Peak hours are 8:00am-1:00am; off-peak hours are 1:00am-8:00am; (ii) traffic management policies are applied per service package rather than discriminating against particular users; (iii) management applies at all times; (iv) based on protocol, P2P, NNTP traffic, and other bulk, non-real-time and non-interactive applications are given lower priority and load at different times (Bit Torrent is included in this); (v) "Based on the protocol, headers are usually inspected and packets are profiled to determine the traffic type. This enables the network to

	prioritize the network traffic"; (vi) While BXI uses statistics to better understand usage patterns, it does not store or retain data itself
TELUS Communications Company	TELUS does not currently utilize Internet traffic management technologies such as deep packet inspection.
Videotron Ltd.	Videotron does not use Internet traffic managing technologies, such as Deep Packet Inspection.
Bragg Communications Inc.	(i) traffic management tends to occur during peak times that were confidentially filed in 1(c). (ii) It is not a standard practice to target individual users; this is difficult to perform given that end-users typically receive dynamic IP addresses, though in extreme situations this might be attempted; (iii) current practices are used when it is determined to be necessary. Practices are regularly adjusted by system administrators – the limits imposed by the technology vary by time of day, seasonally and in response to other factors so that the limits applied at any given time are only as strict as necessary to address the congestion; (iv) High-bandwidth that are latency insensitive are targeted. Examples include: Bittorrent, News, DirectConnect, P2P (Blubster, gnutella, KaZaA, WinMX, eDonkey, Filetopia, Hotline, GuruGuru, Soribada, Soulseek, Ares, JoltID, eMule, Waste, Konspire2b, ExoSee, FurtherNet, MUTE, GNUnet, Nodezilla); (v) the technology looks at packet headers and the behaviour of packet exchanges to identify packet flows. No insight into the *content* of packet flow is gained, as would be were each packet inspected using DPI. Content is never reviewed, analyzed, or stored; (vi) Yes, information is stored for traffic management and trending purposes

d) Provide details on the effects that your Internet traffic management technologies have on end-user Internet bandwidth (e.g. provide specific changes in upload and download speed in kbps).

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: the effect of traffic management technologies is to slow the upstream and downstream bandwidth available to customers for P2P use between 1630 and 0200. Bell Aliant Atlantic: does not currently utilize Internet traffic management technologies such as DPI Bell Mobility: does not currently utilize Internet traffic management technologies such as DPI
Cogeco Cable Canada Inc.	Limits upstream traffic. Amount filed in confidence.
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used.
Rogers Cable Communications Inc	Numbers filed in confidence. Notes decrease in both upload and download traffic.
Saskatchewan Telecommunications	Does not use Internet Traffic Management techniques. For security purposes, does use Arbor Peakflow SP product. Does not believe using this device for detecting, analyzing, and mitigating anomalies related to DDoS attacks, botnets, etc as the traffic management techniques Commission is interested in.
Primus Telecommunications Canada Inc.	Does not use traffic management technologies such as DPI or related types of management tools.
Shaw Communications Inc	Traffic management has resulted in reduced rate of upstream consumption to a manageable level. This enables customers to reach their full contract speeds.
Barrett Xplore Inc	When a user exceeds their allocated fair capacity allotment their upload and download speeds are managed at a confidential rate
TELUS Communications Company	TELUS does not currently utilize Internet traffic management technologies such as deep packet inspection.
Videotron Ltd.	Videotron does not use Internet traffic managing technologies, such as Deep Packet Inspection.
Bragg Communications Inc.	Does not have access to the information to provide a response to this question

e) Has there been a change in average end-user monthly usage since implementing Internet traffic management technologies? If so, by what amount did the average upstream and downstream usage change (in Gb per month)?

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: Response to question 9 addresses this. Bell Aliant Atlantic: does not currently utilize Internet traffic management technologies such as DPI Bell Mobility: does not currently utilize Internet traffic management technologies such as DPI
Cogeco Cable Canada Inc.	Downstream is not currently affected by management. Upstream has decreased, without new policies, since fall 2007 and is believed to be result of use of online video over P2P. Specific growth numbers filed in confidence.
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used.
Rogers Cable Communications Inc	Implemented since 2005. Growth numbers files in confidence.
Saskatchewan Telecommunications	Does not use Internet Traffic Management techniques. For security purposes, does use Arbor Peakflow SP product. Does not believe using this device for detecting, analyzing, and mitigating anomalies related to DDoS attacks, botnets, etc as the traffic management techniques Commission is interested in.
Primus Telecommunications Canada Inc.	Does not use traffic management technologies such as DPI or related types of management tools.
Shaw Communications Inc	Yes, which has led to a confidential growth rate that is predictable.
Barrett Xplore Inc	They have no basis for assessing any potential change in usage
TELUS Communications Company	TELUS does not currently utilize Internet traffic management technologies such as deep packet inspection.
Videotron Ltd.	Videotron does not use Internet traffic managing technologies, such as Deep Packet Inspection.
Bragg Communications Inc.	Does not have access to the information to provide a response to this question

f) Are your Internet traffic management technologies used on both wholesale and retail customers? If yes, are there any differences in how the traffic of these customers is managed?

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: See response to 8c Bell Aliant Atlantic: does not currently utilize Internet traffic management technologies such as DPI Bell Mobility: does not currently utilize Internet traffic management technologies such as DPI
Cogeco Cable Canada Inc.	Yes, to both without differences.
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used.
Rogers Cable Communications Inc	Wholesale customers not currently affected (technical reasons), though this will be remedied in the near future. Rogers policies will then apply to their own, and wholesale, customers.
Saskatchewan Telecommunications	Does not use Internet Traffic Management techniques. For security purposes, does use Arbor Peakflow SP product. Does not believe using this device for detecting, analyzing, and mitigating anomalies related to DDoS attacks, botnets, etc as the traffic management techniques Commission is interested in.
Primus Telecommunications Canada Inc.	Does not use traffic management technologies such as DPI or related types of management tools.
Shaw Communications Inc	Same policies applied to retail and wholesale customers
Barrett Xplore Inc	Filed in confidence
TELUS Communications Company	TELUS does not currently utilize Internet traffic management technologies such as deep packet inspection.
Videotron Ltd.	Videotron does not use Internet traffic managing technologies, such as Deep Packet Inspection.
Bragg Communications Inc.	Dynamic IP customers receive same policies. Static IP cable customers are not subject to them. Dedicated fibre/wholesale customers are not subject to DPI policies, with the exclusion of a single fibre customer who requested the application of DPI policies

g) Can the Internet traffic management technologies that you employ be applied:

i) to specific end-users?
ii) at specific times of day?
iii) in response to specific network conditions (e.g. congested states)?
iv) to specific locations in your networks?
v) to specific applications?

If so, explain how this could be done in each case.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline: (i) Yes, while it could be applied to particular end-users, it is instead being used to manage large groups of users (e.g. all users belonging to Bell Sympatico); (ii) Yes (1630 to 0200); (iii) Yes (P2P congestion); (iv) Yes (DPI for management purposes limited to locations in network where DPI deployed); (v) yes (P2P, in particular Bittorrent) Bell Aliant Atlantic: does not currently utilize Internet traffic management technologies such as DPI Bell Mobility: does not currently utilize Internet traffic management technologies such as DPI
Cogeco Cable Canada Inc.	(i) no, to IP addresses alone. Given rotation of IP addresses would require external intelligence systems to correlate IP with particular customers; (ii) can be applied at specific times of day; (iii) No, because DPI are installed between CMTS and Core routers; (iv) cannot be targeted at specific locations; (v) Can be applied to specific applications
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used.
Rogers Cable Communications Inc	(i) theoretically, but not without large costs; (ii) Yes, but not done this way now; (iii –iv) while possible not practical given that congestion relief performed on thousand of network ports each years; (v) Yes.
Saskatchewan Telecommunications	Does not use Internet Traffic Management techniques. For security purposes, does use Arbor Peakflow SP product. Does not believe using this device for detecting, analyzing, and mitigating anomalies related to DDoS attacks, botnets, etc as the traffic management techniques Commission is interested in.
Primus Telecommunications Canada Inc.	Does not use traffic management technologies such as DPI or related types of management tools.
Shaw Communications Inc	(i) devices could be used this way but are not, and would require several months to configure; (ii) devices could be used this way but are not, and would require several months to configure; (ii) devices could be used this way but are not, and would require extensive software application development; (iv) devices could be used this way, though Shaw does not currently do so and the feasibility of such implementations would depend on the technology deployed within each Shaw region and location; (v) Yes, the Arbor-Ellacoya devices could be deployed based on specific recognized/recognizable applications

Barrett Xplore Inc	(i) Yes, but does not apply to specific customers; (ii) Yes; (iii) Yes; (iv) Yes; (v) Yes.
TELUS Communications Company	TELUS does not currently utilize Internet traffic management technologies such as deep packet inspection.
Videotron Ltd.	Videotron does not use Internet traffic managing technologies, such as Deep Packet Inspection.
Bragg Communications Inc.	(i) given that customers receive dynamic IP addresses, this would be challenging to implement. This would be relatively easy to implement for static customers; (ii) Yes, this capacity exists and is employed for time of day policies; (iii) Not aware of an inherent capability for the technology to take proactive action in response to specific network conditions; (iv) high bandwidth applications that are latency insensitive, such as file sharing are targeted so that time sensitive applications have sufficient bandwidth to function properly. Applications that are targeted: Bit Torrent, News, DirectConnect, P2P (Blubster, Gnutella, KaZaA, WinMX, eDonkey, Filtopia, Hotline, GuruGuru, Soribada, Soulseek, Ares, JoltID, eMule, Waste, Konspire2b, ExoSee, FurtherNet, MUTE, GNUnet, Nodezilla); (v) Yes, this capacity exists

Alternative Internet Traffic Management Practices

Q.9 If you utilize Internet traffic management practices as alternatives or in addition to the technology-based practices identified in Question 8 above, such as monthly bandwidth capacity limits, excess bandwidth usage charges, network upgrades, time of day pricing, content caching etc.:

a) Identify the practices that you use.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline and Bell Mobility: (i) investing in capital; (ii) moving towards usage-based pricing and new business models in a manner that benefits end-users and that takes into account the realities of the market; (iii) managing bandwidth by managing or terminating the service of subscribers who consistently breach the AUP; (iv) balancing Internet traffic during peak periods to redistribute P2P file-sharing to off-peak periods. Bell Aliant Atlantic: (i) investments in capital infrastructure; (ii) uses an AUP to notify users it has the right to manage network. Excessive bandwidth use is not permitted.
Cogeco Cable Canada Inc.	AUP intended to normatively mitigate massive use of bandwidth; reserves rights (to be implemented by end of 2009) to charge for excessive use of bandwidth
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used. Presently, engineering principles at MTS Allstream refute the notion that traffic managing practices can operate as a stand-alone way of meeting traffic pattern changes. Usage-based billing is the primary service options that the ISP sees as suitable for offering differentiated service options, though it does not currently have this service option.
Rogers Cable Communications Inc	Consumption caps, capacity augmentation, AUP, block access to child pornography.
Saskatchewan Telecommunications	Internet traffic management practices not deployed along fixed wireline or fixed wireless broadband services or the out of province DSL based services. Out of province, non-DSL services do have a usage-based billing, but this is not intended to restrict traffic or be punitive for high usage customers. AUP does clearly identify conditions upon which Wireless data services, Smartphone, and Blackberry Access services cannot be used for (incl. P2P, games, streaming movies, dedicated data connections, VoIP, or other high-bandwidth/capacity uses)

Primus Telecommunications Canada Inc.	Only traffic management practice currently employed is network upgrades
Shaw Communications Inc	Technology and bandwidth usage caps are used
Barrett Xplore Inc	Provisioning is encoded into modems, as well as using ??? switches to prioritize VoIP traffic on the fixed wireless network.
TELUS Communications Company	Relies on proactive and reactive capacity management practices (i.e. review and augment capacity), as well as contractual monthly usage allowance and its abuse management processes.
Videotron Ltd.	Videotron does not throttle Internet connections, but does impose upload and download quotas, thereby creating financial incentives for users to self-regulate their Internet usage. This is the only thing that Videotron does to 'stop' a minority of users from taking up the majority of network capacity. Even when users reach their allocated monthly caps, their transfer speeds remain constant/at the advertised rate.
Bragg Communications Inc.	N/A

b) For each practice that you use, explain why you chose to use it. The response should address what conditions led you to implement this practice and why you could not rely on existing provisioning practices.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Mobility: (i) for purposes of augmenting capacity $375 million on Wireline connections has been spent on average each year since 2001. There is not as clear a value given by Bell Mobility, though it notes they spent $750 million in the recent Advanced Wireless Services spectrum auction; (ii) pricing-based mechanisms are intended to match prices with use, to the benefit of both customers and business. Bell Mobility has always had these sorts of usage-based pricing models and currently offers differential rate plans; (iii) intends to apply bandwidth shaping to all customers, including wholesale customers, to mitigate the increases in P2P traffic; (iv) DPI used to redistribute P2P traffic from 'on' to 'off' times to enhance customer satisfaction with the product. Bell Aliant Atlantic: No direct response
Cogeco Cable Canada Inc.	AUP intended to normatively mitigate massive use of bandwidth; reserves rights (to be implemented by end of 2009) to charge for excessive use of bandwidth
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used. Presently, engineering principles at MTS Allstream refute the notion that traffic managing practices can operate as a stand-alone way of meeting traffic pattern changes. Usage-based billing is the primary service options that the ISP sees as suitable for offering differentiated service options, though it does not currently have this service option.
Rogers Cable Communications Inc	Variety of practices uses to maximize service delivery and comply with law
Saskatchewan Telecommunications	Customers using cellular data are charged for usage, not for unlimited data. AUP is intended to mitigate and manage use of data services on cellular network.
Primus Telecommunications Canada Inc.	Only traffic management practice currently employed is network upgrades
Shaw Communications Inc	Percentage of customers who exceed bandwidth caps filed in confidence. Specific monthly caps are intended to let CSR discuss bandwidth uses with customers who are disproportionally using large sums of bandwidth. This is a small group of customers.
Barrett Xplore Inc	Must prioritize VoIP to provide service comparable to traditional telephone.
TELUS Communications Company	Uses customer representatives to verbally discuss capacity excesses, rather than automated systems to assist individuals clients adjust services to meet their needs.
Videotron Ltd.	Videotron does not throttle Internet connections, but does impose upload and download quotas, thereby creating financial incentives for users to

	self-regulate their Internet usage. This is the only thing that Videotron does to 'stop' a minority of users from taking up the majority of network capacity. Even when users reach their allocated monthly caps, their transfer speeds remain constant/at the advertised rate.
Bragg Communications Inc.	N/A

c) Describe in detail how the implemented practices assist in traffic management. The response should include a discussion on how they are used, when they are used, and where they are used.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Mobility: see responses to 9a and b for details Bell Aliant Atlantic: no direct response
Cogeco Cable Canada Inc.	AUP intended to normatively mitigate massive use of bandwidth; reserves rights (to be implemented by end of 2009) to charge for excessive use of bandwidth
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used. Presently, engineering principles at MTS Allstream refute the notion that traffic managing practices can operate as a stand-alone way of meeting traffic pattern changes. Usage-based billing is the primary service options that the ISP sees as suitable for offering differentiated service options, though it does not currently have this service option.
Rogers Cable Communications Inc	Consumption associates costs with use, enabling recuperation of high use costs; capacity augmentation mitigates issues with congestion; AUP normatively precludes certain high-traffic uses such as spam and web hosting; child porn blocking meets commitments with RCMP
Saskatchewan Telecommunications	Charging based on usage encourages consumers to limit excessive consumption of bandwidth. To date, no terminations of a customer's wireless service from excessive use of the network has happened.
Primus Telecommunications Canada Inc.	Only traffic management practice currently employed is network upgrades
Shaw Communications Inc	Bandwidth caps let customers plan Internet usage appropriately and choose service based on needs. They only impact the highest usage customers, many of whom experience this as a result of unsecured wireless APs. Bandwidth caps do not impact upstream or downsteam traffic speeds.
Barrett Xplore Inc	VoIP given first access to network resources by allocating specific bandwidth to the VoIP protocol and deeming this bandwidth off-limits to other protocols in times of high congestion.
TELUS Communications Company	Outline a 4 stage process of discussing with clients issues surrounding excessive use of network capacity. CSR contact not always possible because of limited resources. Not clear what happens if CSR does not make contact, though suggests that management process occurs regardless. Numbers are filed in confidence.
Videotron Ltd.	Videotron does not throttle Internet connections, but does impose upload and download quotas, thereby creating financial incentives for users to self-regulate their Internet usage. This is the only thing that Videotron does to 'stop' a minority of users from taking up the majority of network

	capacity. Even when users reach their allocated monthly caps, their transfer speeds remain constant/at the advertised rate.
Bragg Communications Inc.	N/A

d) Provide details on the effects that these practices have on end-user Internet bandwidth (e.g. provide specific changes in upload and download speed in kbps).

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Mobility: uses a scale; at 1630 P2P upstream and downstream speeds slow to 512 kbps and to 256 at 1800. At 0100 speeds increase to 512kbps and to full speed by 0200. Bell Aliant Atlantic: no direct response given
Cogeco Cable Canada Inc.	Does not track this information
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used. Presently, engineering principles at MTS Allstream refute the notion that traffic managing practices can operate as a stand-alone way of meeting traffic pattern changes. Usage-based billing is the primary service options that the ISP sees as suitable for offering differentiated service options, though it does not currently have this service option.
Rogers Cable Communications Inc	Filed entirely in confidence
Saskatchewan Telecommunications	Tiered wireless data pricing has existed since SaskTel introduced service; SaskTel has no other experiences with end-user bandwidth in this market.
Primus Telecommunications Canada Inc.	Only traffic management practice currently employed is network upgrades
Shaw Communications Inc	No change in average end-user monthly bandwidth usage since implementing the caps.
Barrett Xplore Inc	Any impact on Internet bandwidth the result of high-volume VoIP traffic which leads to particular bandwidth allocation.
TELUS Communications Company	Do not deal with abuse through managing bandwidth, but through CSR.
Videotron Ltd.	Videotron does not throttle Internet connections, but does impose upload and download quotas, thereby creating financial incentives for users to self-regulate their Internet usage. This is the only thing that Videotron does to 'stop' a minority of users from taking up the majority of network capacity. Even when users reach their allocated monthly caps, their transfer speeds remain constant/at the advertised rate.
Bragg Communications Inc.	N/A

e) Has there been a change in average end-user monthly usage since implementing these practices? If so, by what amount did the average upstream and downstream usage change (in Gb per month)?

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Mobility: Not in response; likely filed in confidence. Bell Aliant Atlantic: No direct response given
Cogeco Cable Canada Inc.	Does not track this information
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used. Presently, engineering principles at MTS Allstream refute the notion that traffic managing practices can operate as a stand-alone way of meeting traffic pattern changes. Usage-based billing is the primary service options that the ISP sees as suitable for offering differentiated service options, though it does not currently have this service option.
Rogers Cable Communications Inc	Information only available for November 2007-2008, but actual numbers filed in confidence
Saskatchewan Telecommunications	Tiered wireless data pricing has existed since SaskTel introduced service; SaskTel has no other experiences with end-user bandwidth in this market.
Primus Telecommunications Canada Inc.	Only traffic management practice currently employed is network upgrades
Shaw Communications Inc	Apply equally to wholesale and retail customers. Shaw contacts wholesalers, to contact their end-users, when bandwidth exceeded rather than contacting wholesaler customers directly
Barrett Xplore Inc	The fixed wireline network does not show substantial increases or decreases in monthly usage based on application of the VoIP switches
TELUS Communications Company	Given manual nature of CSR relationships, data cannot be provided.
Videotron Ltd.	Videotron does not throttle Internet connections, but does impose upload and download quotas, thereby creating financial incentives for users to self-regulate their Internet usage. This is the only thing that Videotron does to 'stop' a minority of users from taking up the majority of network capacity. Even when users reach their allocated monthly caps, their transfer speeds remain constant/at the advertised rate.
Bragg Communications Inc.	N/A

f) Are these practices used on both wholesale and retail customers? If yes, are there any differences in how the traffic of these customers is managed?

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline & Bell Mobility: Wholescale and retail customers will both have these management techniques applied. Bell Aliant Atlantic: No direct response given Bell Wireline's disclosure suggests that wholesaler customers represent a smaller portion of customers than retail customers, yet use a disproportionate amount of bandwidth. This amount has doubled from consumption levels prior to the deployment of traffic shaping even though the total user base has remained relatively stable. Bell Wireline offers three possible reasons: (i) filed in confidence; (ii) greater utilization of HTTP for content sharing; (iii) the typical behaviour of wholesaler user base, where average per wholesaler customer is higher across all protocol types. Bell Wireline also performs rerouting along less congested links, though they are limited in their ability to route traffic because this can increase latencies.
Cogeco Cable Canada Inc.	Same practices to both, on basis that this must be done to remain fair to all customers and mitigate abuse.
MTS Allstream Inc.	Interprets CRTC request to be asking if MTS Allstream uses management technologies that would actively inspect Internet traffic to isolate composition types for the purposes of applying a differentiated traffic processing standard. No such technologies are used. Presently, engineering principles at MTS Allstream refute the notion that traffic managing practices can operate as a stand-alone way of meeting traffic pattern changes. Usage-based billing is the primary service options that the ISP sees as suitable for offering differentiated service options, though it does not currently have this service option.
Rogers Cable Communications Inc	Aims to equally deploy policies, but technical limitations prevent enforcement on wholesale accounts
Saskatchewan Telecommunications	Does not sell wireless data as a wholesale product
Primus Telecommunications Canada Inc.	Does not sell wholesale broadband internet service
Shaw Communications Inc	No direct response to question (can be inferred from 9e)
Barrett Xplore Inc	Filed in confidence
TELUS Communications Company	Measures apply to wireline services to consumers and small businesses. Regarding wireless, contractual allowances and usage-sensitive limits largely eliminate the need for CSR policies. For wholesale customers, TELUS does not manage their content, but does expect those ISPs to manage their own end-user bandwidth requirements and network abuse situations. Some information filed in confidence.
Videotron Ltd.	Videotron does not throttle Internet connections, but does impose upload and download quotas, thereby creating financial incentives for users to

	self-regulate their Internet usage. This is the only thing that Videotron does to 'stop' a minority of users from taking up the majority of network capacity. Even when users reach their allocated monthly caps, their transfer speeds remain constant/at the advertised rate.
Bragg Communications Inc.	N/A

General Traffic Management Practices

Q.10 With reference to Internet traffic management practices discussed in Questions 8 and 9, does your company plan to implement new capabilities for these practices? Your response should include details about the availability of any upgrades to the capabilities of the technologies being employed as well as the rationale for introducing new capabilities.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	There are no plans to implement any new capabilities to their Internet traffic management practices that have not been discussed in responses to questions 8 and 9
Cogeco Cable Canada Inc.	Plans to implement a usage billing platform for excessive bandwidth charged by end of 2009. Specifics filed in confidence.
MTS Allstream Inc.	Reference responses to questions 8 and 9.
Rogers Cable Communications Inc	No specific plans, though new systems are possible depending on circumstances
Saskatchewan Telecommunications	Currently do not manage in or out of province fixed wireline or wireless broadband. Capacities may be pursued if required to meet business needs. Details on wireless data via mobile browsers filed in confidence. Expectation to implement real-time tracking of wireless data capacity in late 2009 to flag customers who are using excessive bandwidth.
Primus Telecommunications Canada Inc.	Question is not applicable to network upgrades identified in response to question 9
Shaw Communications Inc	Filed in confidence
Barrett Xplore Inc	Filed in confidence
TELUS Communications Company	Filed in confidence.
Videotron Ltd.	Videotron has no plans to change their present policy.
Bragg Communications Inc.	No current plans to implement new capabilities, though monitors market and industry trends to adjust policies are required to provide best consumer experience

General Traffic Management Practices

Q.11 If your company does not currently utilize Internet traffic management practices, explain fully why you have chosen to not employ any Internet traffic management practices (both technology-related or alternative).

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Not applicable given Bell Wireline (includes Bell Internet and Bell Aliant in Ontario and Quebec). Bell Aliant in the Atlantic provinces and Bell Mobility do not currently utilize management practices.
Cogeco Cable Canada Inc.	Current applied traffic management practices
MTS Allstream Inc.	Given current capital investment analyses, investment in traffic management technologies has not been justified. Such a justification is necessary to deploy these technologies.
Rogers Cable Communications Inc	Does not deploy traffic management practices
Saskatchewan Telecommunications	Does not use traffic management practices. Is not planning on deploying because (a) network capacity has stayed ahead of traffic requirements; (b) usage based billing systems are costly to develop and implement; (c) there is an anticipated high human cost for usage-based practices. Out of province fixed wired and wireless services not subject to traffic management because usage of service is profitable. While wireless mobile tiered data models similar to wireless data has been explored, high costs of implementation led to business case not being developed. Wireless data is not currently managed because not enough data used that would overwhelm network.
Primus Telecommunications Canada Inc.	Primus uses alternate Internet traffic management practices as described in response to question 9
Shaw Communications Inc	Not applicable to Shaw
Barrett Xplore Inc	Does not employee traffic management practices
TELUS Communications Company	Filed in confidence.
Videotron Ltd.	Videotron does not use traffic managing technologies because (translated) "For the moment, Videotron is satisfied by the results obtained by management practices base on transfer limits and overusage surcharges."
Bragg Communications Inc.	N/A

General Traffic Management Practices

Q.12 If your company does not currently utilize Internet traffic management practices, are there conditions under which you would introduce such practices? If yes, describe these circumstances and explain why you would use Internet traffic management practices.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Not applicable given Bell Wireline (includes Bell Internet and Bell Aliant in Ontario and Quebec). Bell Aliant in the Atlantic provinces and Bell Mobility do not currently utilize management practices.
Cogeco Cable Canada Inc.	Currently uses Internet management practices.
MTS Allstream Inc.	Given current capital investment analyses, investment in traffic management technologies has not been justified. Such a justification is necessary to deploy these technologies.
Rogers Cable Communications Inc	Does not deploy traffic management practices.
Saskatchewan Telecommunications	Cases that would lead to deployment: (a) customer demands outstrip capacity and augmentation cannot be economically accomplished; (b) if competitive forces require introduction of alternate service definitions; (c) if there was a need to enforce the AUP so that there was sufficient network capacity for all end-users.
Primus Telecommunications Canada Inc.	Primus uses alternate Internet traffic management practices as described in response to question 9
Shaw Communications Inc	Not applicable to Shaw
Barrett Xplore Inc	Filed in confidence
TELUS Communications Company	Does not currently use management technologies such as deep packet inspection, *and has no plans to do so*.
Videotron Ltd.	A dramatic surge in peak-time usage by all or some of Videotron's customers might make Videotron rethink its policy on this matter.
Bragg Communications Inc.	N/A

Q:13 Are there Internet traffic management practices that you are planning to employ that are not discussed in Questions 8 or 9? If so, describe these potential solutions. Your answer should include a discussion of any work your company has undertaken or is currently undertaking with equipment or software vendors and service providers to develop new solutions. Your answer should also identify the timeframes planned for implementing these solutions.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	No responses provided
Cogeco Cable Canada Inc.	Filed in confidence, though will be adding excessive use charged by end of 2009
MTS Allstream Inc.	See response to question 9
Rogers Cable Communications Inc	No additional practices planned, though they will be updated to meet ongoing usage patterns, security threats, etc.
Saskatchewan Telecommunications	No, does not plan to employ additional management practices.
Primus Telecommunications Canada Inc.	Filed in confidence
Shaw Communications Inc	Shaw is not planning to employ additional traffic management solutions
Barrett Xplore Inc	See response to question 10 (was filed in confidence)
TELUS Communications Company	Does not intend to employ management practices outside of those mentioned in responses to questions 8 and 9
Videotron Ltd.	No; there are no other techniques used by Videotron to manage Internet traffic.
Bragg Communications Inc.	Continues to monitor the industry trends and the local competitive markets

Q.14 Besides managing traffic congestion, what other reasons could lead to, or have lead to, the utilization of Internet traffic management practices on your networks (such as to facilitate billing, spam control, or legal requirements)?

Bell Aliant Regional Communications Limited Partnership Bell Canada	First: see responses to questions 8 and 9. Beyond this, they will continue to consider Internet traffic management practices that "enable fair and equitable use of their networks for the enjoyment of all their customers."
Cogeco Cable Canada Inc.	Some higher level filters used as needed to respond to aggressive network conditions (high volumes of SPAM, widescale viral outbreak, etc) – these are specific fixes and not general management techniques.
MTS Allstream Inc.	(1) reduction of SPAM and viruses; (2) current compliance with law enforcement [under no other situation would ISP inspect or monitor transmissions]; (3) note that billing has *not* been seen as a reason for traffic management practices – costs of tracking usage have acted as a deterrent to using different billing methodologies to influence Internet traffic.
Rogers Cable Communications Inc	Lets Rogers manage SPAM, viral outbreaks, law enforcement requirements (DPC?), and block access to offshore child porn sites
Saskatchewan Telecommunications	Beyond capacity issues, would implement management to (a) ensure usage conforms to AUPs; (b) defend against DDoS attacks; (c) assist in implementing one or more forms of usage-based billing
Primus Telecommunications Canada Inc.	Steps, such as blocking port 25, to prevent SPAM are in place. Future traffic management includes but is not limited to (a) prioritization of delay sensitive applications; (b) blocking viruses/malware before it enters Primus' network.
Shaw Communications Inc	In addition to using Arbor-Ellacoya devices for traffic management, they are also used to control customers' email capacities to ensure that they do not access external mail servers to send SPAM. Also participating in the Cleanfeed Canada program, which is aimed at preventing child exploitation.
Barrett Xplore Inc	Filed in confidence
TELUS Communications Company	Does not currently use traffic management such as DPI. Does use alternative management practices outlines in 9(b). Save for other items mentioned in response to questions 10 and 11, has nothing to add here. Information regarding stated capability of these technologies are publicly available.
Videotron Ltd.	See responses to questions 11 and 12. Videotron cannot speculate on any other reasons that would make them rethink their policy on this matter.
Bragg Communications Inc.	Traffic management tools assist in providing network security (limiting viruses, DDoS attacks) and trouble shooing network and customer specific problems

Q.15 If Internet traffic management practices are in place for your customers, do you advise them of these practices? If so, what information is provided, when is it provided, and how is it communicated? If you provide both retail and wholesale Internet services, your answer should clearly indicate any differences in your notification practices between wholesale and retail customers.

Bell Aliant Regional Communications/ Limited Partnership/ Bell Canada	Bell Wireline (included Bell Internet and Bell Aliant in Ontario and Quebec): uses an AUP, FAQ with detailed traffic shaping information and way for customers to report problems with non-P2P being shaped. Provided a letter to the Commission January 9 2009 stating that it would inform wholesale GAS customers of changes a minimum of 30 days in advance of traffic shaping practices that could affect the material performance of GAS services. Bell Mobility: AUP Bell Aliant Atlantic: AUP; for wholesale customers uses the Terms of Service in the General Tariff Identity Restrictions on Use (similar in intent to the AUP)
Cogeco Cable Canada Inc.	Does not provide detailed information on basis that it would defeat the purposes and efficiency of traffic management tools. AUP notes that Cogeco has right to monitor bandwidth without specifics as to how.
MTS Allstream Inc.	See responses to questions 8 and 9
Rogers Cable Communications Inc	Does not proactively notify customers of practices, and provides general information when asked or AUP examined.
Saskatchewan Telecommunications	Were management to be implemented, non-contracted customers would be told of changes. For contract customers, changes would not likely be made during contract term. Traffic management would be communications in proposal documents or as part of quotation and contract documents. Wholesale customers would be notified as retail customers would be. End-users of wholesale customers would be notified by SaskTel. Wireless data contracts explicitly note amount of data allowed, and overage costs. Policy also available online, and through CSR.
Primus Telecommunications Canada Inc.	Customers advised of practices through corporate website.
Shaw Communications Inc	Bandwidth cap information available at website, AUP, and through CSRs. Updates to this information done via Shaw's website and AUP. Cap changes apply equally to retail and wholescale customers. When deployed Arbor-Ellacoya devices, no formal communication made to consumers, and given that the devices were operational in Shaw's network when it began its wholesale business, no notification was necessary
Barrett Xplore Inc	Advised through a fair information policy that is delivered in hardcopy to subscribers. Dealers advised to inform customers. Note: some of this has been filed in confidence.

	Entirety filed on February 9, 2009. Information available through legal section of website; End User Agreement (in its second paragraph); welcome guide for customers includes End User Agreement; Customer Care reps can inform customers; dealers instructed to inform their customers.
TELUS Communications Company	Usage allowances and abuse management processes are communicated to clients in their usage limits that are associated with client contracts. Combine upload/download into single usage number.
Videotron Ltd.	Videotron notifies its customers of the montly limits of their subscription. All resellers get the same information, and it is up to them to communicate them, or not, to their customers.
Bragg Communications Inc.	Information included in AUP, through CSRs, company website. Some is in relatively plain language.