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## Part 1 Application by the Public Interest Advocacy Centre (PIAC) & Vaxination Informatique

# Regarding Vidéotron's Practices Related to its Mobile Wireless Unlimited Music Service

**CRTC Reference Nos: 8661-P8-201510199 & 8622-V42-201510735**

## Intervention of the Canadian Internet Policy & Public Interest clinic (CIPPIC)

**October 14, 2015**

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## INTRODUCTION

1. The Canadian Internet Policy & Public Interest Clinic (CIPPIC) is intervening in this hybrid Part 1 Application in support of complaints filed by the Public Interest Advocacy Centre (PIAC) and Vaxination Informatique against Vidéotron's (a subsidiary of Québecor Média Inc.) respecting its newly introduced Unlimited Music service. CIPPIC is a legal clinic whose mandate is to advocate in the public interest on issues arising at the intersection of law and technology.

2. Vidéotron recently announced Unlimited Music, a mobile platform that offers access to a curated list of music streaming services over Vidéotron's mobile data network without imposing data fees on the customers. Offerings of this kind raise concerns of undue preference, unjust discrimination and, more broadly, net neutrality, as addressed by the Commission specifically in Broadcasting and Telecom Decision CRTC 2015-26 and, more broadly in Telecom Regulatory Policy CRTC 2009-657 (extended to mobile Internet access in Telecom Decision CRTC 2010-445). By zero rating specific services or categories thereof, Vidéotron is leveraging its role as a gateway to network content in order to provide its chosen services an advantage that no other competing service can match. Doing so disrupts the neutral ecosystem that is necessary for digital innovation to continue to flourish. It also raises serious ancillary privacy questions.

### I. Economic ITMPs & Zero Rating: some introductory concepts

3. *As indicated in the Part 1 applications that launched this proceeding, Vidéotron's Unlimited Music service confers on Vidéotron an undue preference. It leverages Vidéotron's unique capabilities as a carrier in order to preference its own music platform, Unlimited Music. This is exacerbated by the fact that Vidéotron operates an economic Internet Traffic Management Practice of general application that strictly limits data usage on its network, purportedly to manage congestion on its mobile data networks.*[1] *It then modifies this ITMP of general*

[1] Tying billing to data usage for purposes other than congestion management would be wholly arbitrary and misleading. The impression provided to customers is that they are 'paying' for what they are 'using'. However,

*application so that its own Unlimited Music service is wholly excluded from it, rendering the entire ITMP preferential and, in CIPPIC's view, unduly so.*

### (a) Vidéotron's Mobile usage based billing is an economic ITMP

4. Some service providers have historically presented economic ITMPs as billing arrangements, arguing these do not constitute congestion-management mechanisms and therefore are not caught by the Commissions' ITMP framework. When last considering zero-rated services, the Commission left this issue unresolved.[2] It should be noted that usage-based billing is, inherently, an economic ITMP and cannot be classified as a billing arrangement, as has long been recognized by the Commission:

> A broad range of ITMPs are available to ISPs. The ITMPs currently employed by Canadian ISPs include technical approaches, which manage traffic to prevent or respond to network congestion, as well as economic approaches,[6] which link rates for Internet service to end-user consumption.
>
> [6] Economic ITMPs include monthly bandwidth capacity limits, where users who exceed a predefined threshold must pay additional money for bandwidth consumed…[3]

The premise that monthly usage restrictions are economic ITMPs designed to manage congestion is difficult to refute. They are presented to customers as a means of connecting payment to consumption and, on data networks, consumption is a meaningless concept if not tied to congestion, as it would have no impact on other customers' network experience[4] and would impose no costs on network operators.[5] Without such impacts (that is, without any connection to congestion whatsoever), charging customers for 'usage' would be wholly arbitrary.

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[2] Broadcasting and Telecom Decision CRTC 2015-26, <http://www.crtc.gc.ca/eng/archive/2015/2015-26.htm>, para. 31 (emphasis added): "Wireless carriers can use ITMPs to manage traffic and address possible congestion in their networks. The data charges relating to the data connectivity and/or transport by Bell Mobility and Videotron of their mobile TV services could be a form of an economic ITMP; that is, they **could** be established in a way to manage traffic."

[3] Telecom Regulatory Policy CRTC 2009-657, <http://www.crtc.gc.ca/eng/archive/2009/2009-657.htm>, para 20 and footnote 6.

[4] Telecom Public Notice CRTC 2008-19, <http://www.crtc.gc.ca/eng/archive/2008/pt2008-19.htm>, footnote 6: "Network congestion is broadly defined to mean a situation whereby the amount of traffic transiting the network may lead to a deterioration in service for some end-users."

[5] CIPPIC/OpenMedia.ca, Reply Comments, March 28, 2011, Telecom Notice of Consultation CRTC 2011-77, <https://cippic.ca/uploads/ReplyComments-2011_77.pdf>, paras. 21-24.

The ultimate legitimacy of a usage-based billing scheme is dependent on its correlation to congestion (a correlation which has been questioned, but is not at issue in this proceeding). Such a practice can only be a traffic management practice.

**(b) Zero rating services such as Unlimited Music are generally problematic**

5. As noted above, Vidéotron's Unlimited Music service is a zero rating proposition. Zero rating generally entails granting subscribers access to a service, or bucket of services, while having data associated with usage of the given service(s) excluded from their allocated bandwidth caps.[6] Zero rating policies are implemented when subscribers are incentivized to avoid exceeding a bandwidth cap, an issue that does not tend to arise when subscribers are provided with unlimited bandwidth capacity.[7]

6. Zero rating can operate as a powerful incentive for individuals to use particular services (e.g. a particular video streaming service, where one is zero rated and others are not) or content categories (e.g. video-based streaming services to listen to music, as opposed to pure audio-based services to listen to music). As CIPPIC has explained previously, these types of usage-based incentives are disproportionately effective at guiding customer conduct. End users over-react to usage based costing and curtail usage of services with a per GB cost attached in excess of their willingness to pay for such a service. This is because customers are risk averse while usage-based billing models impose the 'risk' onto customers by forcing them to estimate per GB costs which are unintuitive, complex and

[6] C.T. Marsden, "Network neutrality: Towards a Co-regulatory Solution", (London: Bloomsbury Academic, 2010); A. Odlyzko, B. St. Arnaud, E. Stallman & M. Weinberg, "Know Your Limits: Considering the Role of Data Caps and Usage Based Billing in Internet Access Service," April 23, 2012, <https://www.publicknowledge.org/documents/know-your-limits-considering-the-role-of-data-caps-and-usage- based-billing>; Open Internet Advisory Committee, "Policy Issues in Data Caps and Usage-Based Pricing: Economic Impacts of Open Internet Frameworks Working Group", https://transition.fcc.gov/cgb/oiac/Economic-Impacts.pdf; Patrick Maillé, and Bruno Tuffin. (2014) Telecommunication Network Economics: From Theory to Applications, Cambridge University Press; Jeffrey Eisenach. (2015). "Economics of Zero Rating," http://www.nera.com/content/dam/nera/publications/2015/EconomicsofZeroRating.pdf.

[7] C.T. Marsden, "Comparative Case Studies in Implementing Net Neutrality: A Critical Analysis," (2015) *TPRC 43*, SSRN <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2587920>.

difficult to estimate in advance.[8] As a result, customers will intuitively over-estimate how much they are 'using' which, in turn, greatly depresses use of any services that may contribute to overall monthly costs.[9] Compounding this confluence of risk aversion and complex cost assessment are the 'cognitive' or 'mental' transaction costs associated with usage monitoring. The economic literature demonstrates that end users will err on the side of caution and forgo usage rather than undertaking the time involved in constantly assessing usage, even with the presence of usage measurement tools.[10]

7. Against this backdrop of powerful use disincentives, the impact of zero-rating a service that is capable of generated significant proportions of data usage allotments is significant. A competing offering, using comparable data consumption and offering a comparable, or even somewhat superior, service will not be able to compete on equal footing. This, in turn, harms innovation by elevating one service over another based on arbitrary criteria – its ability to make an arrangement with the mobile service provider in question. The negative innovation impacts of zero rating schemes extend beyond a specific service market. For example, zero rating a category of applications such as 'video streaming services' can impact on ancillary categories. YouTube, Vevo and Vimeo, for example, are categorized as 'video streaming services', but are also significant sources of music streaming where data consumption is mitigated as a factor.[11] Zero rating 'video streaming services', therefore, will impact on negatively on innovation amongst 'music streaming services'. If audio streaming via YouTube avoids mobile data consumption costs, customers will shift mobile music streaming to YouTube and away from audio streaming services such as Spotify, and vice versa.

8. More generally, zero rating any particular category of services subverts the innovative

[8] Telecom Regulatory Policy CRTC 2013-271, <http://www.crtc.gc.ca/eng/archive/2013/2013-271.htm>, para 114.
[9] These effects are summarized in A. Odlyzko, "The History of Communications and its Implications for the Internet", June 16, 2000, <http://www.dtc.umn.edu/~odlyzko/doc/history.communications0.pdf>, at pp 71-72.
[10] N. Szabo, "Micropayments and Mental Transaction Costs", in 2nd Berlin Internet Economics Workshop, <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.23.9779>.
[11] <http://www.musicbusinessworldwide.com/youtube-is-the-no-1-music-streaming-platform-and-getting-bigger/>, and <http://home.bt.com/tech-gadgets/tech-news/youtube-is-now-the-biggest-source-of-music-for-young-people-11363996775912>.

potential of the Internet more generally based on arbitrary criteria – namely, a mobile service provider's preference in favour of one type of service over another. This is true regardless of how broadly the zero-rated category is framed. The strength of digital innovation is that anyone can access an audience or user base without having to seek permission from an intermediary.[12] Individuals are thereby the primary arbiters of which services are best, not network access providers, creating optimal conditions for innovation. Even where zero rating schemes attempt to emulate this (by, for example, zero-rating the most 'popular' services or categories thereof), it harms the paradigm by hindering the emergence of unexpected and wholly different models. For example, as elaborated below, zero rating currently popular music services could hinder the adoption of new models of audio streaming such as personal cloud solutions.

9. Additionally, as digital services continue to evolve, zero rated categories can diversify into ancillary services. For example, music streaming services increasingly embed social networking functionality.[13] A zero-rated music streaming service could therefore enjoy a significant advantage over a social networking site with music streaming capacity. For example, MySpace is one of the longest enduring social networking sites with over 50 million remaining unique visitors per month,[14] offers social networking functionality alongside comprehensive music streaming on both its mobile website and on its mobile applications.[15] Its Android mobile application page boasts that it provides "free access to the world's largest digital music catalog."[16] Will MySpace be zero rated? If so, what about other primary social networking sites with less evolved music streaming services? This constantly evolving ecosystem is what fuels digital innovation, but it is also what renders any attempt by an

[12] B. van Schewick, "Analysis of Proposed Network Neutrality Rules", February 18, 2015, <https://cyberlaw.stanford.edu/downloads/vanSchewick2015AnalysisofProposedNetworkNeutralityRules.pdf>, p. 15.
[13] <http://www.nytimes.com/2015/07/02/technology/personaltech/apple-music-is-strong-on-design-weak-on-social-networking.html>.
[14] <http://blogs.wsj.com/cmo/2015/01/14/myspace-still-reaches-50-million-people-each-month/>.
[15] <http://myspace.desk.com/customer/portal/articles/506943-myspace-from-your-mobile-phone>, accessed October 14, 2015.
[16] <https://play.google.com/store/apps/details?id=com.myspace.spacerock&hl=en>, accessed October 14, 2015.

access provider to preference one model over another a dangerous proposition.

### (c) Vidéotron likely uses Deep Packet Inspection to carry out its zero rating service

10. While no information is available regarding the specific techniques employed by Vidéotron to manage its zero rating service, it is very likely that it employs Deep Packet Inspection equipment to do so. This is relevant to the overall assessment of the service, as the nature and functionality of such equipment has implications regarding the potential parameters of the Unlimited Music service as well as its assessment in light of the *Telecommunications Act* policy objectives.

#### *Deep Packet Inspection Equipment*

11. Deep packet inspection lets network operators analyze packets of network traffic with greater depth and sophistication in order to gain insight into the customers' network activity and to act on it. Historically, network routing equipment would only inspect the control information necessary to move packets from their origin to their destination. In reference to the OSI packet layer model, this control information was encapsulated in 1 – 3 headers. In addition, Layer 4 control information guides interactions between ISP network equipment and end user systems. Collectively, Layers 1-4 comprise the 'data transport' layers and include all the information an ISP requires to route data,[17] In spite of this, deep packet inspection entails interrogating a packet beyond the data transport header information (1-4) in order to analyze information that is generated for and by users and applications at either end of a network.[18] This includes OSI Layers 4-7, which contain

[17] T. Israel, "Submission to the Office of the Privacy Commissioner of Canada: Rogers' Use of Deep Packet Inspection Equipment," December 2, 2009, *Canadian Internet Policy & Public Interest Clinic (CIPPIC)*, <https://cippic.ca/sites/default/files/OPC-Submission-Rogers_and_DPI-FINAL.pdf>, pp. 7-8.

[18] Chang-Su Moon and Sun-Hyung Kim. (2014). "A Study on the Integrated Security System based Real-time Network Packet Deep Inspection," http://www.sersc.org/journals/IJSIA/vol8_no1_2014/11.pdf; Christopher Parsons. (2013). "The Politics of Deep Packet Inspection: What Drives Contemporary Western Internet Service Provider Surveillance Practices," https://www.christopher-parsons.com/Academic/Parsons_Christopher_PhD_2013.pdf; Christian Fuchs. (2012). "Implications of Deep Packet Inspection (DPI) Internet Surveillance for Society," http://fuchs.uti.at/wp-content/uploads/DPI.pdf; Ericsson. (2010). "Policies Protect Profits: Traffic Inspection for Visibility, Control and New Business Opportunities," http://archive.ericsson.net/service/internet/picov/get?DocNo=8/28701-FGB101256; Ben Wagner. (2008). "Deep Packet Inspection and Internet Censorship: International Convergence on an 'Integrated Technology of Control'," https://advox.globalvoices.org/wp-

control information generated by and for end user applications such as Email clients, word processors and others) as well as content generated by end users (the text of an email, document or other transmitted content). In terms of the TCP/IP packet model, DPI-based analyses analyze the TCP/UDP Header information as well as the packet payload. Figure I by Moon and Kim[19] provides a visual representation of this:

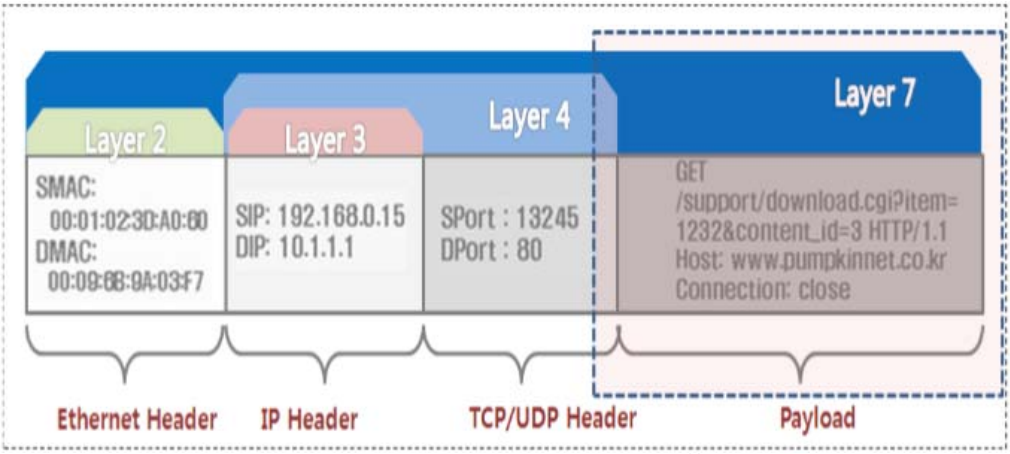


**Figure I: Packet Inspection models[20]**

This diagram lists the OSI layer labeling along the top and the TCP/IP model labeling along the bottom. The key point, however, is that everything after Layer 4 or the TCP/UDP Header contains data that a network service provider (whether wireless or wireline) does not require in order to route communications from origin to destination.

12. As a technology, DPI can be functionally defined as "the ability to collect information and optionally take action based on the information in or that can be inferred from the content of the communication".[21] As such, the practice of deeply inspecting packets can be integrated into specialized hardware and often can be adjustable through software. In general, network equipment with DPI capabilities can let network operators "view and

content/uploads/2009/06/deeppacketinspectionandinternet-censorship2.pdf.

[19] Chang-Su Moon and Sun-Hyung Kim. (2014). "A Study on the Integrated Security System based Real-time Network Packet Deep Inspection," http://www.sersc.org/journals/IJSIA/vol8_no1_2014/11.pdf.

[20] Chang-Su Moon and Sun-Hyung Kim. (2014). "A Study on the Integrated Security System based Real-time Network Packet Deep Inspection," http://www.sersc.org/journals/IJSIA/vol8_no1_2014/11.pdf.

[21] Radisys. (2010). "DPI: Deep Packet Inspection Motivations, Technology, and Approaches for Improving Broadband Service Provider ROI," http://go.radisys.com/rs/radisys/images/paper-dpi-motivations.pdf.

analyze network activity down to the subscriber, peering, and application level. It provides a real-time snapshot of network traffic and consumption, and historical analytics to drive development of new, differentiated services".[22] DPI capabilities can either be integrated into general purpose networking equipment (such as at key networking gateways), placed as stand-alone networking equipment (either offline of packet flows or inline and capable of acting on network traffic in real time in accordance with a set of networking policies), or be collocated with networking gateways. Placement can affect the scope of traffic that can be acted on or inspected, as well as the types of operations that might be carried out.

13. DPI equipment is designed to examine packets in their totality and to examine individual packets (or collections thereof) for characteristics against predefined rulesets. These rulesets automate the identification of traffic and, subsequently, how the data will be treated at a network operations level (e.g. prioritize, de-prioritize or block traffic that matches predefined rulesets) as well as at the billing level (e.g. identify certain traffic flows and measure the magnitude of these in order to exclude them from monthly billing – zero rating). The actual equipment that examine traffic is often integrated with policy servers which, themselves, direct the DPI boxes in how to treat traffic and how to correlate identified traffic with telecommunications policies associated with particular subscribers.[23]

14. While there are some variations in how particular products implement various DPI functionalities, there are commonalities that arguably reach across the industry as a whole. Moreover the activities themselves are often interchangeable. One of the strengths of DPI as a technology is its versatility in responding to rulesets. Thus, a DPI appliance that is installed in order to identify peer to peer file-sharing applications so that these can be 'managed' could potentially be reconfigured to block peer to peer applications with minimal effort. It could potentially also be reconfigured to identify music-streaming applications in order to track the magnitude of their usage by end users for billing

[22] Procera. (2012). Intelligent Policy Enforcement Solutions for Cloud Service Providers," http://www.proceranetworks.com/pdf/use-cases/Procera_Cloud_Broch_A4a.pdf.
[23] Graham Finnie/Heavy Reading. (2009). "ISP Traffic Management Technologies: The State of the Art," http://publications.gc.ca/collections/collection_2009/crtc/BC92-68-2009E.pdf.

purposes. Depending on the configuration of the initial equipment, its capacity and its location within the network, this shift could conceivably be accomplished simply by changing the rulesets.

15. Before applying a set of rules ('track magnitude of usage'; 'slow down to 100 kbps'; 'block access'), DPI equipment must identify a flow of packets as associated with a particular application, third party service or other criteria. The primary means by which DPI achieves this is called signature analysis.[24] Signature analysis can involve analyzing packets or flows of packets for specific traffic patterns, or for specific characteristic profiles (port address, character strings and/or numerical size of packets) associated with specific applications or types of traffic.[25] Whereas traffic pattern analysis can be accomplished without intruding into the payload of a packet, profile-based inspection often will. String analysis is a particularly precise form of DPI analysis that entails examining a packet for unique numeric and alphabetical characteristics, such as the name of the application responsible for sending the packet, the URL destination of the packet, or other equivalent and static alphanumeric combinations that can be distinctly mapped to a service or packet (flow) destination or point of origin.[26]

16. DPI can also engage in full packet analysis. Such analysis entails intruding even deeper into the content of a packet in order to extract, in some cases, content-based metadata about the packet or packet flow (e.g. audio or video codec used, client device and device type, operating system and browser used).[27] Additional information that can be extracted by a

[24] T. Israel, "Submission to the Office of the Privacy Commissioner of Canada: Rogers' Use of Deep Packet Inspection Equipment," December 2, 2009, *Canadian Internet Policy & Public Interest Clinic (CIPPIC)*, <https://cippic.ca/sites/default/files/OPC-Submission-Rogers_and_DPI-FINAL.pdf>.
[25] Christopher Parsons. (2013). "The Politics of Deep Packet Inspection: What Drives Contemporary Western Internet Service Provider Surveillance Practices," https://www.christopher-parsons.com/Academic/Parsons_Christopher_PhD_2013.pdf.
[26] Christopher Parsons. (2013). "The Politics of Deep Packet Inspection: What Drives Contemporary Western Internet Service Provider Surveillance Practices," https://www.christopher-parsons.com/Academic/Parsons_Christopher_PhD_2013.pdf. T. Israel, "Submission to the Office of the Privacy Commissioner of Canada: Rogers' Use of Deep Packet Inspection Equipment," December 2, 2009, *Canadian Internet Policy & Public Interest Clinic (CIPPIC)*, <https://cippic.ca/sites/default/files/OPC-Submission-Rogers_and_DPI-FINAL.pdf>.
[27] Sandvine. (2015). "Internet Traffic Classification,"

protocol-aware, full packet, analysis system include telephone numbers, email addresses, and SIP URI.[28] Moreover, when analyzing unencrypted communications, the entire packet can be analyzed (e.g. filenames, email or email attachment text).[29] Doing so is an issue of configuration, not functionality, as analyzing 'headers' for strings of text is not qualitatively different from analyzing an email text for a particular phrase.[30] DPI equipment can even be used to change traffic, including web pages or email text, in real time.[31]

17. In effect, DPI can extract a range of information from network traffic. As examples, application identification information can be extracted, to confirm that SIP, SMTP, YouTube, Facebook, BitTorrent, Skype, etc are being used by a particular subscriber. Metadata can be extracted, such that a URL, file name, browser type, cookies, DNS queries, video codec, IMSI, SIP caller/callee, user ID, login, etc. Metadata can also be computed, including delay, jitter, and application response time.[32] Protocols can also be interrogated to determine where packet flows will follow from initial control packets. Though the most intrusive analyses of DPI can mitigated by encryption that is, the payload of packets can be secured from inspection by using transport- and content-level encryption, transport encryption such as SSL/TLS typically leaks enough information to still positively identify the type of traffic being transmitted.[33]

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https://www.sandvine.com/downloads/general/sandvine-technology-showcases/traffic-classification-identifying-and-measuring-internet-traffic.pdf.

[28] Radisys. (2010). "DPI: Deep Packet Inspection Motivations, Technology, and Approaches for Improving Broadband Service Provider ROI," http://go.radisys.com/rs/radisys/images/paper-dpi-motivations.pdf.

[29] Nate Anderson. (2007). "Deep packet inspection meets 'Net neutrality, CALEA," http://arstechnica.com/gadgets/2007/07/deep-packet-inspection-meets-net-neutrality/.

[30] T. Israel, "Submission to the Office of the Privacy Commissioner of Canada: Rogers' Use of Deep Packet Inspection Equipment," December 2, 2009, *Canadian Internet Policy & Public Interest Clinic (CIPPIC)*, <https://cippic.ca/sites/default/files/OPC-Submission-Rogers_and_DPI-FINAL.pdf>.

[31] Ben Wagner. (2008). "Deep Packet Inspection and Internet Censorship: International Convergence on an 'Integrated Technology of Control'," https://advox.globalvoices.org/wp-content/uploads/2009/06/deeppacketinspectionandinternet-censorship2.pdf. R. Clayton, "The Phorm 'Webwise' System", April 4, 2008, <https://www.cl.cam.ac.uk/~rnc1/080404-phorm.pdf>.

[32] Heavy Reading. (2012). "The Role of DPI in an SDN World," http://www.qosmos.com/wp-content/uploads/2013/03/Heavy_Reading-Qosmos_DPI-SDN-WP_Dec-2012.pdf.

[33] Sandvine. (2015). "Internet Traffic Classification," <https://www.sandvine.com/downloads/general/sandvine-technology-showcases/traffic-classification-identifying-and-measuring-internet-traffic.pdf>; GSM Association, "Network Management of Encrypted

18. The adoption of SSL/TLS encryption can impede, but does not always prevent, DPI equipment from interrogating data traffic and positively identifying it. In its standard implementation, TLS encryption will obscure the name of the application or service being accessed. However, where a client supports Server Name Indication ("SNI", an extension to the TLS protocol) it will indicate the hostname that it is trying to contact at the initial stage (handshake) of a connection. In such cases, analyzing the handshake will reveal the domain that the client is contacting (e.g. an Internet browser is trying to reach Spotify.com).[34] Second, some have advocated the adoption of weakened encryption mechanisms that transmit significant amounts of information unencrypted in order to facilitate DPI-based information gathering.[35] If this were to become widespread practice, it would allow for DPI application-identification to occur even where encryption is utilized. Finally, even when the specific service being contacted is not known and the transmission is encrypted (i.e. it's not clear that YouTube is being accessed, and the data transmission is secured from DPI-based content analysis), a network operator using DPI could determine the likely *kind* of content being accessed based on volume of data which is being returned to the subscriber; different volumes of data may indicate mp3 streaming, that they are receiving video traffic encoded at 480p, 720p, 1080p, or 4K, or that they are engaged in routine web browsing.

19. However, each of these mechanisms for defeating encryption is problematic. The use of Server Name Identification (SNI) is discretionary and not within the control of the data service provider. Each user agent (browser) can decide for itself whether to use it or not and customers can often modify their browsers to remove this feature even when added.[36] Moreover, both this option and the second option (encouraging the adoption of encryption half-measures that do not fully protect transmitted data) are undesirable as they undermine

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Traffic", Version 1.0, February 28, 2015, <http://www.gsma.com/newsroom/wp-content/uploads/WWG-04-v1-0.pdf>, section 4.1.4.

[34] Sandvine. (2015). "Internet Traffic Classification," https://www.sandvine.com/downloads/general/sandvine-technology-showcases/traffic-classification-identifying-and-measuring-internet-traffic.pdf.

[35] GSM Association, "Network Management of Encrypted Traffic", Version 1.0, February 28, 2015, <http://www.gsma.com/newsroom/wp-content/uploads/WWG-04-v1-0.pdf>, section 4.2.1.

[36] GSM Association, "Network Management of Encrypted Traffic", Version 1.0, February 28, 2015, <http://www.gsma.com/newsroom/wp-content/uploads/WWG-04-v1-0.pdf>, section 4.1.4.

overall privacy and security by revealing information that would otherwise be intentionally encrypted.[37]

20. Finally, relying on heuristics (traffic patterns) such as 'volume of data' is an imprecise means of assessing the actual service being used. For one thing, traffic (and particularly content-streaming traffic) will often transmit at 'faster than realtime' rates in order to facilitated buffering on the end device to avoid quality disparities arising from imperfect network conditions.[38] This renders identification based on perceived data volume rates (320 kbps = high quality music stream) difficult as it can lead to significant fluctuations on the per second volume of data being transmitted. Moreover, as application-specific traffic patterns are subject to change, identifying services in this manner is an ongoing 'arms race', meaning that much traffic sought might be 'missed'.[39] While heuristics-based analysis may be sufficiently precise for certain types of traffic management, it is likely not precise enough for billing purposes, where miscalculations can lead to significant costs for end users. As a result of these shortcomings, encryption can be an impediment to the adoption of zero rating services (or, in the alternative, the adoption of zero rating services can be an impediment to encryption).

***Zero Rating & Deep Packet Inspection Equipment***

21. DPI equipment can be used to identify data traffic and, correspondingly, apply different service rates to differently identified kinds of traffic. Indeed, one of the drivers of DPI as a vendor-sold product is to meet telecommunications companies' perceived "desire to create more sophisticated service tiers for mobile data customers — in which, for example, specific allowances are applied to some applications, or certain content or sites are zero-rated".[40]

22. Zero rating of certain Internet traffic is predicated on analyzing, to some extent, the content

[37] GSM Association, "Network Management of Encrypted Traffic", Version 1.0, February 28, 2015, <http://www.gsma.com/newsroom/wp-content/uploads/WWG-04-v1-0.pdf>, section 4.2.1.
[38] A. Odlyzko, "The Delusions of Net Neutrality", August 31, 2008, <http://www.dtc.umn.edu/~odlyzko/doc/net.neutrality.delusions.pdf>, pp. 4-5.
[39] GSM Association, "Network Management of Encrypted Traffic", Version 1.0, February 28, 2015, <http://www.gsma.com/newsroom/wp-content/uploads/WWG-04-v1-0.pdf>, section 4.1.5.
[40] Heavy Reading. (2012). "The Role of DPI in an SDN World," http://www.qosmos.com/wp-content/uploads/2013/03/Heavy_Reading-Qosmos_DPI-SDN-WP_Dec-2012.pdf.

that subscribers are accessing. The 3GPP Policy Charging Control (PCC) architecture, in combination with Policy and Charging Enforcement Function (PCEF) and Policy and Charging Rules Function (PCRF) establishes standards for quality of service and charging rules, along with additional functions. The PCEF is principally responsible for correlating traffic against PCC rules and, once a packet or packet flow is identified, it can be charged appropriate against a subscriber's telecommunications package.

23. Telecommunications companies routinely use deep packet inspection systems to determine what traffic a subscriber is transmitting or receiving. Such inspection, which is correlated with 3GPP standards,[41] often involves either embedding DPI functionality within GPRS support nodes (GGSNs) or at Packet Gateways (P-GWs).[42] Actually conducting content-based analysis, and billing, involves filtering "traffic into flows based on IP quintuples (source IP address, destination IP address, port numbers, protocol and/or URL) ... When traffic passing through the GGSN matches a rule, the data packet will be accumulated in the related rating bucket".[43] Though DPI is often integrated into GGSNs and P-GWs, it can also be placed in the network as "a dedicated appliance or blade built by a specialist DPI vendor, often collocated with GGSN. DPI can also be found in network probes ... load balancers and specialist security software."[44]

24. Zero-rating is made possible by engaging in protocol- and content-aware analyses of data traffic. The effectiveness of such analyses vary, however. Telecommunications companies sometimes use DPI functionality built into GGSNs and P-GWs to correlate IP address and DNS records; specifically, they might zero-rate traffic destined for a particular service, such as Facebook, and dynamically determine what IP addresses are associated with Facebook's

[41] Jean-Gabriel Remy, Charlotte Letamendia. (2014). LTE Standards, p. 190.
[42] Heavy Reading. (2012). "The Role of DPI in an SDN World," http://www.qosmos.com/wp-content/uploads/2013/03/Heavy_Reading-Qosmos_DPI-SDN-WP_Dec-2012.pdf; Kamaljit I. Lakhataria. (2009). "Providing content based billing architecture over Next Generation Network," http://arxiv.org/abs/1008.2036.
[43] Kamaljit I. Lakhataria. (2009). "Providing content based billing architecture over Next Generation Network," http://arxiv.org/abs/1008.2036.
[44] Heavy Reading. (2012). "The Role of DPI in an SDN World," http://www.qosmos.com/wp-content/uploads/2013/03/Heavy_Reading-Qosmos_DPI-SDN-WP_Dec-2012.pdf.

domain name (facebook.com). Such analyses would involve obtaining information that the Telecommunications company would not normally have by intruding into layer 7, or the payload, of packets to look for indicators such as domain name ("facebook.com") nested in the packet payload. Conducting such analyses do improve upon zero-rating solutions that solely depended on IP-based zero-rating because they can more precisely ensure that appropriate IP-based traffic are zero rated, though the analyses do not "know when to remove 'expired' IP addresses from the list".[45]

25. The accuracy of DPI solutions can lead to misidentified data traffic as a result of either false positives or negatives. Moreover, when DPI is integrated into another technology — that is, when a DPI appliance isn't co-located with a GGSN or P-GW, but DPI functionality is baked into multi-purpose networking equipment — recognition rates can be less accurate than a dedicated appliance as less processing power is available to conduct the analysis.[46] However, though those rates may decrease for sophisticated analysis a zero-rated analysis effort may remain successful, so long as the analytics engines are neither generating significant numbers of either false positives or false negatives. If traffic is incorrectly identified as zero-rated video traffic the telecommunications provider may inaccurately count the data a user has consumed against a general bandwidth cap and, in the opposite case, data traffic that was not supposed to count towards a general cap actually does.

26. Zero rating is possible without the use of DPI equipment. However, this requires routing all zero-rated traffic through a centralized portal or the creation of dedicated applications for each zero-rated service (and, often, with customizations for each service provider or device). Vidéotron's Unlimited Music service does not appear to require either of these, strongly suggesting that its zero rating is accomplished by means of Deep Packet Inspection equipment.

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[45] Sandvine. (2015). "Internet Traffic Classification," https://www.sandvine.com/downloads/general/sandvine-technology-showcases/traffic-classification-identifying-and-measuring-internet-traffic.pdf.

[46] Sandvine. (2015). "Internet Traffic Classification," https://www.sandvine.com/downloads/general/sandvine-technology-showcases/traffic-classification-identifying-and-measuring-internet-traffic.pdf.

## II. Unlimited Music is preferential and discriminatory

27. As indicated in the Part 1 applications that launched this proceeding, Vidéotron's Unlimited Music service confers on Vidéotron an undue preference. It leverages Vidéotron's unique capabilities as a carrier in order to preference its own music platform, Unlimited Music. This is exacerbated by the fact that Vidéotron operates an economic Internet Traffic Management Practice of general application that strictly limits data usage on its network. It then modifies this ITMP of general application so that its own Unlimited Music service is wholly excluded from it, rendering the entire ITMP preferential. Moreover, Vidéotron's modified economic ITMP discriminates heavily against third party services. It specifically discriminates against excluded music streaming services. More generally, it discriminates against any third party services of comparable data consumption.

### (a) Unlimited Music constitutes a preference that is undue and unreasonable

28. Vidéotron extracts significant advantages that are directly attributable to its preferential modification of its economic ITMP. Unlimited Music is available to any Vidéotron mobile subscriber of one of its "[a]ll-inclusive Canada-wide plan with 2GB, 4GB and 6GB" monthly usage.[47] Music streaming typically occurs at bandwidth rates between 128 and 320 kbps.[48] Some low quality streams may be as low as 96 kbps, but the recent trend is towards higher quality music streaming services. This range is typical of music streaming services included in Vidéotron's Unlimited Music zero rating scheme. Spotify's default setting on mobile devices streams music at 96 kbps, but it offers a 160 kbps setting and, for Premium subscribers, a 320 kbps mode.[49] Google Play Music adjusts its bitrate, up to a maximum of 320 kbps, based on the quality of the mobile network connection on which it is being streamed, as detected by its mobile application.[50] However, users can override this quality variability by adjusting settings and, moreover, CRTC testing of Google Play Music on a

[47] <http://www.videotron.com/unlimitedmusic>, accessed October 12, 2015.
[48] CRTC, Communications Monitoring Report 2014, <http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2014/cmr5.htm>, Figures 5.3.8 – 5.3.12.
[49] <https://support.spotify.com/us/learn-more/faq/#!/article/What-bitrate-does-Spotify-use-for-streaming>, accessed October 12, 2015
[50] <https://support.google.com/googleplay/answer/1391343?hl=en>, accessed October 12, 2015.

mobile connection indicated an average bitrate of 261.5 kbps.[51] On mobile devices, Deezer offers an ad-supported 128kbps tier and a subscription-based 320 kbps high quality tier.[52] Rdio allows all users to choose bitrates ranging from a "data-efficient 64 kbps" up to 192 kbps, whereas premium subscription users can stream at 320 kbps.[53]

29. We note parenthetically that while Vidéotron's Unlimited Music website reserves to it the right to charge for music streaming activities that are in excess of 128 kbps,[54] it is not clear on what basis such charging decisions would be made, how it would determine whether (and to what extent) streaming exceeds 128 kbps, or how the charging of such surfeits can be fairly communicated to customers. It is only buried in FAQs that Vidéotron provides this potential qualifier and, even if Vidéotron were to bill for higher bitrates, data usage billing is never accompanied by per-application usage breakdown meaning that customers may never discover they have paid for streaming higher quality music. It should be pointed out as well that the imposition of charges on this basis may violate the Wireless Code, clause A.3 of which prohibits imposing overage charges for services described as being offered on an 'unlimited' basis.[55]

30. To assess monthly usage, we adopt reasonable 1 and 1.5 hour per day usage scenarios. This correlates to a not-unreasonable bi-directional commute of 30-45 minutes, for example. Further, a Nielsen Music survey estimates that 90% of Canadians spent at least 3.4 hours per day listening to music (up to 4.4 hours per day for teenagers) in 2014.[56] Numeris estimates that Canadians spent an average of 2 hours per day listening to radio, alone, in 2013.[57] It should be noted that due to the zero data rating, customers are likely to gravitate

[51] CRTC, Communications Monitoring Report 2014, <http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2014/cmr5.htm>, Figure 5.3.10.
[52] <http://www.whathifi.com/deezer/review>.
[53] <http://blog.rdio.com/us/2014/10/introducing-high-quality-aac-audio-across-the-globe.html>.
[54] <http://support.videotron.com/residential/mobile/unlimited-music>, accessed October 15, 2015.
[55] Telecom Regulatory Policy CRTC 2013-271, <http://www.crtc.gc.ca/eng/archive/2013/2013-271.htm>.
[56] A. Cross, "Study: Canadians Are Spending More Time Listening to Music", ajournalofmusicalthings.com, June 4, 2015, <http://ajournalofmusicalthings.com/study-canadians-are-spending-more-time-listening-to-music-heres-how-we-listen/>.
[57] CRTC, Communications Monitoring Report 2014, <http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2014/cmr5.htm>, Table 4.1.7, uses two

to higher bitrates. Presuming that 1 to 1.5 hours of this time will be spent on mobile devices is not, therefore, unreasonable.

31. While network quality might affect data rates to some degree, as noted above, CRTC testing of Google Play Music on a mobile connection indicated an average bitrate of 261.5 kbps, exceeding all but the highest quality tier.[58] In addition, many streaming services will use progressive download techniques – a mechanism that transmits content faster than real-time to cache content on local devices, so that variations in network quality do not undermine content quality.[59] As a result, it is reasonable to assume that actual data usage will be within this range.

| Quality | Usage per month (GB)<br>@ 1 hour \| 1.5 hours per day |
|---|---|
| 96 kbps | 1.3 GB \| 1.9 GB |
| 128 kbps | 1.7 GB \| 2.6 GB |
| 192 kbps | 2.6 GB \| 3.9 GB |
| 256 kbps | 3.5 GB \| 5.2 GB |
| 320 kbps | 4.3 GB \| 6.5 GB |

**Table 1 – Monthly Consumption Scenarios[60]**

At these usage rates, the services in question would consume all or significant amounts of a customer's 2 GB, 4 GB or 6 GB data allotment absent the zero rating offered by Vidéotron. This places them in the category of data applications that customers can only use with great caution, or risk steep additional data usage penalties.

32. Even streaming 1 hour per day at 128 kbps will consume almost one third of the highest

measurement tools, a diary and a portable meter, to estimate weekly radio listening per Canadian at about 19.3 and 9.7 hours, respectively. This amounts to an average of 14.5 hours per week, or about 2 hours per day.

[58] CRTC, Communications Monitoring Report 2014, <http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2014/cmr5.htm>, Figure 5.3.10.

[59] A. Odlyzko, "The Delusions of Net Neutrality", August 31, 2008, <http://www.dtc.umn.edu/~odlyzko/doc/net.neutrality.delusions.pdf>, pp. 4-5.

[60] Monthly usage derived as: [Quality * 3,600 seconds per hour | 5,400 seconds per 90 minutes * 30 days per month] / 8,000,000 Kilobits per GigaByte.

data allotment category (6 GB) and will mean the difference between a 2 GB per month plan and a 4GB per month plan (a value of $9 per month).[61] Heavier usage at the 128 kbps bitrate increases monthly data consumption by orders of magnitude: 2 hours / day = 3.5 GB / month; 3 hours / day = 5 GB / month; 4 hours /day = 7 GB / month. A person streaming 128 kbps for an entire 7 hour work day 5 days a week will generate 8.5 GB per month, well in excess of Vidéotron's highest data bucket. The benefit conferred to its own branded Unlimited Music service (and customers of that service) over other digital content is therefore significant.

33. In addition to branding related advantages, Unlimited Music can extract additional benefits from its preferential treatment of participating music streaming services. Vidéotron appears to require that third party partners in its zero rating platform enter into express agreements of unknown parameters with it.[62] Vidéotron has stressed that it does not extract payment through these agreements.[63] However, it *is* able to extract other advantages from the unique zero rating arrangement it offers its partners. For example, in conjunction with the launch of its Unlimited Music service, Vidéotron announced a new special and exclusive arrangement with Stingray Music, one of its few select inaugural Unlimited Music partners. The partnership provided "exclusive channels for Videotron Mobile customers" as part of the free Stingray Music app.[64] It is not known whether this, or other advantages of this kind are gained by Vidéotron in return from its preferential platform.

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[61] http://www.videotron.com/residential/mobile/mobile-plans

[62] See for example, Vidéotron, "Agreement with Music Streaming Players – Videotron Mobile's New Unlimited Music Service Lets Customers Listen to Music Without Using Data", *Canada Newswire*, August 27, 2015, <http://www.newswire.ca/news-releases/agreement-with-leading-music-streaming-players---videotron-mobiles-new-unlimited-music-service-lets-customers-listen-to-music-without-using-data-523091451.html>: "We are proud to be able to offer our customers this service thanks to our agreements with key industry players…"

[63] A. Karadeglija, "PIAC Launches Complaint Against Videotron Music Service", *The Wire Report*, September 1, 2015, <http://www.thewirereport.ca/news/2015/09/01/piac-launches-complaint-against-videotron-music-service/30016>.

[64] Vidéotron, "Agreement with Music Streaming Players – Videotron Mobile's New Unlimited Music Service Lets Customers Listen to Music Without Using Data", *Canada Newswire*, August 27, 2015, <http://www.newswire.ca/news-releases/agreement-with-leading-music-streaming-players---videotron-mobiles-new-unlimited-music-service-lets-customers-listen-to-music-without-using-data-523091451.html>.

34. In addition, as also noted above, it is likely that Vidéotron's zero rating of Unlimited Music partner services is achieved by use of deep packet inspection equipment. The information gathered from the use of this equipment could be used by Vidéotron to gain key and unique insight into its customers' music listening preferences across a range of services that are playing an increasingly central role in music listening.[65]

35. Its use of DPI equipment would also allow it to use customer data in order to generate mobile advertising revenues. In this regard, Vidéotron's privacy policy does not mention that it uses customer data of any kind to profile customers for the purpose of selling targeted advertisements.[66] However, the policy does envision service-specific ancillary arrangements that could, if in place, be used as legal justification for the use of information obtained by means of the Unlimited Music service for advertising purposes.[67] Moreover, Québecor operates an aggressive mobile digital advertising campaign, and has entered into close partnerships with a mobile advertising firm in order to "help [it] better monetize [its] mobile traffic, create new ad units and engage new audiences across [its] mobile network."[68] If, as is common, these mobile monetization efforts are fueled by customer profiling, customer music preferences can enrich the underlying profiles used and by extension the value of Vidéotron's mobile monetization based on information it could not acquire without operating its Unlimited Music service in the absence of express customer consent.[69] If such monetization is occurring, it would constitute an additional benefit to Vidéotron that is directly attributable to its preferential treatment of its Unlimited Music partner services, heightening its undue nature.

36. In conclusion, at its most basic, Vidéotron extracts significant benefits from its preferential

[65] A. Cross, "Study: Canadians Are Spending More Time Listening to Music", ajournalofmusicalthings.com, June 4, 2015, <http://ajournalofmusicalthings.com/study-canadians-are-spending-more-time-listening-to-music-heres-how-we-listen/>.
[66] <http://corpo.videotron.com/static/site/static/pdf/en/nouveau_code_videotron-en.pdf>.
[67] <http://corpo.videotron.com/static/site/static/pdf/en/nouveau_code_videotron-en.pdf>, section 3.2.
[68] <http://strategyonline.ca/2014/09/16/the-new-ooh-front-quebecor-media-out-of-home-takes-digital-to-the-heart-of-the-action/>, <http://strategyonline.ca/2014/09/16/the-new-ooh-front-quebecor-media-out-of-home-takes-digital-to-the-heart-of-the-action/>, and <http://strategyonline.ca/2014/09/16/the-new-ooh-front-juice-mobile-technology-to-provide-the-missing-link-between-mobile-and-ooh-media/>.
[69] <https://www.priv.gc.ca/cf-dc/2015/2015_001_0407_e.asp>.

modification of its economic ITMP of general application. The preferential treatment this modified economic ITMP confers on Vidéotron's partners places it in a unique position to extract further benefits from these partners.

### (b) Unlimited Music unjustly discriminates against downstream services

37. Vidéotron's economic ITMP, as modified to permit zero rating of Unlimited Music partner services, also unjustly discriminates against third party services in numerous ways. First, while Vidéotron claims that the Unlimited Music service is nominally open to any music streaming service, it nonetheless reserves the right to decide on a case by case basis which services will or will not qualify. It does not make clear what criteria will form the basis for its assessment, so it is difficult to assess what music streaming services will ultimately be included or excluded. Second, the service facially excludes a range of comparable services that will experience serious discriminatory impact, such as radio streaming services and private streaming services.[70] Finally, Vidéotron's zero rating scheme discriminates against services it deems to be 'unlawful', despite lacking the capacity and legitimacy to make such determinations.

#### *Not all music streaming services are guaranteed inclusion in Unlimited Music*

38. Vidéotron defends its program on the basis that it will be available to any and all music streaming platforms.[71] However, a more precise description of Vidéotron's zero rating service is that any and all legal music streaming platforms are eligible to *apply* for admission.[72] Vidéotron provides no transparency regarding its assessment criteria, selection process or the availability of an appeal process in case of refusal. Moreover, as noted above, Vidéotron has stated it will not require payment from Unlimited Music partners as a condition of entry into the zero rating program, but it *does* require partners to

[70] Vidéotron, Mobile: Unlimited Music, *Home Support > Mobile > Unlimited Music*, <http://support.videotron.com/residential/mobile/unlimited-music>, accessed October 14, 2015
[71] A. Karadeglija, "PIAC Launches Complaint Against Videotron Music Service", *The Wire Report*, September 1, 2015, <http://www.thewirereport.ca/news/2015/09/01/piac-launches-complaint-against-videotron-music-service/30016>.
[72] Vidéotron, Mobile: Unlimited Music, *Home Support > Mobile > Unlimited Music*, <http://support.videotron.com/residential/mobile/unlimited-music>, accessed October 14, 2015.

enter into agreements with it. It is not clear what, if any, conditions are imposed by means of these agreements. However, as mentioned above, these agreements offer Vidéotron an opportunity to negotiate or extract advantages from would-be partner services. It is possible that the nature of these conditions or negotiation process is such that are sufficiently onerous as to prevent some music streaming services from entering into Vidéotron's zero rating scheme. Without transparent guarantees into the objectivity of this process, there is a substantial risk that some music streaming services could be excluded on a discriminatory basis or, alternatively, that they might be obligated to adopt discriminatorily onerous conditions as the prices of admission.

***Detrimental impact on non-music streaming applications is significant***

39. Vidéotron's Unlimited Music service categorically excludes all private music streaming services. In doing so, it discriminates against an entire method of music streaming – personal streaming solutions. Personal music streaming applications allow individuals to stream their personal library of digital music to their mobile device. This includes applications such as Plex,[73] Subsonic[74] and Serviio,[75] which allow individuals to stream music from their home libraries to their mobile devices. It also includes applications such as DoubleTwist,[76] Bitcasa[77] and Groove[78] which allow users to stream the own digital music files from the cloud. There is no legitimate justification for arbitrarily picking commercial music streaming services to the exclusion of personal streaming services.

40. From an end user's perspective, the act of streaming an iTunes purchased digital song through one of these services and the act of listening to the same song on a 'commercial' streaming service such as Spotify is identical. From a network management perspective, the data transit costs are equally identical. This is a paradigmatic example of a network

[73] https://play.google.com/store/apps/details?id=com.plexapp.android
[74] http://www.subsonic.org/pages/index.jsp
[75] http://serviio.org/apps
[76] https://www.theverge.com/2015/6/16/8791789/doubletwist-cloudplayer-android-app-hands-on
[77] https://www.bitcasa.com/personal/
[78] https://www.microsoft.com/en-us/groove

access provider (Vidéotron) picking one specific business model over another arbitrarily, for its own purposes. It harms the potential for innovation by locking into to one music delivery mechanism that just happens to be currently popular. But in doing so, it closes off the opportunity for alternative (and potentially superior and more innovative) models to gain adoption. Moreover, customers already using such applications for music streaming are unreasonably discriminated against as they are forced to pay usage fees not forced onto customers of comparable music streaming services.

41. Unlimited Music facially excludes radio streaming services such as CBC Music. CBC Music streams content at 128 kbps,[79] meaning it will not impose additional network loads onto Vidéotron's network if it were zero rated. Excluding 'radio' streaming is particularly arbitrary given that many of the music streaming services included by Vidéotron already in its Unlimited Music service organize their streaming options into radio-like curated music channels – indeed, Rdio is expressly designed on the radio music station model.[80] Choosing to zero-rate music streaming applications while excluding streaming applications for music radio stations is difficult to justify on any objective grounds. Yet this choice will have serious impact on how subscribers will ultimately decide to access remote music content on their mobile devices. Again, Vidéotron is using its special position as a network access provider to engrain a particular music streaming model, while preventing others from taking hold. This harms innovation and is, moreover, unreasonably discriminatory to mobile radio streaming applications as well as customers already using such applications.

42. Vidéotron's Unlimited Music platform also unjustly discriminates against non-music streaming third party applications. On what basis, for example, are podcasting applications excluded? From an end user perspective, podcasts compete with music streaming and radio services for mobile device owner's attention on equal footing. Much like streaming

[79] <http://music.cbc.ca/blogs/2012/5/CBC-Music-app-now-available-for-Android-devices >: **"How much data does the CBC Music android app use per hour of listening?** Our music streams at 128kbps. The CBC Music mobile team estimates that the app uses approximately 60 megabytes of data per hour, or 1mb per minute."
[80] https://www.rdio.com/browse/

applications, end users have the option of planning ahead and downloading podcasts onto their devices from WiFi connections to avoid data costs,[81] but the inability to simply pick something to listen to while away from a wireline data connection without having to worry about data consumption is as powerful an impediment to the utility of mobile podcasting applications as it is to music streaming applications. Will social media sites with audio streaming functionality (such as MySpace) be similarly excluded?[82] If so, they are disadvantaged to the extent that their ability to compete on music streaming with sites such as Rdio will be greatly hindered. If they are not excluded, they will suddenly have significant advantages over other social networking sites such as Facebook who will not be able to offer competing zero rated services.

43. Finally, as noted above, the prospect of data-fee-free music streaming can detrimentally impact on the adoption and use of other innovative music streaming sources, such as video streaming sources.[83] This, too, harms digital innovation by giving one type of streaming service (purely audio) an advantage that others (video streaming services) simply cannot match. This is particularly an issue as current audio streaming platforms such as Spotify begin to diversify in order to include podcasting and video streaming capabilities.[84] Even though Vidéotron does not zero rate the podcasting and video streaming functions of Spotify, its zero rating of Spotify's music streaming provides it with a significant advantage as a platform, that pure video streaming sites such as YouTube will find difficult to match.

***Likely to discriminate against services mislabelled as 'unlawful'***

44. Finally, Vidéotron states that it will only zero rate 'lawful' music streaming services. However, Canada's copyright system is organized around the fundamental premise that it is not for data access providers such as Vidéotron to determine what downstream

[81] See, for example, Spotify: <https://support.spotify.com/us/learn-more/guides/?_escaped_fragment_=/article/Listen-offline#!/article/Listen-offline>, accessed October 14, 2015 and Rdio: <http://help.rdio.com/customer/portal/articles/58982-iphone-app-guide>, accessed October 14, 2015.
[82] See discussion above at paras. 7-9.
[83] See discussion above at paras. 7-9.
[84] <http://www.businessinsider.com/heres-spotifys-new-plan-for-video-streaming-2015-5>.

applications are or are not lawful.[85] This approach has been encoded in Canada's *Copyright Act*, which minimizes the role and liability of Internet service providers with respect to allegedly infringing downstream content.[86] This is with good cause. Music streaming and other innovative digital services often operate in a highly complex legal grey area for many years before their ultimate legality is determined in a court. Sites such as YouTube,[87] Veoh,[88] Grooveshark,[89] operated under legal uncertainty for many years before their legally status was definitively established as legal or not. Legality becomes a significantly more complex matter when the inherently global nature of digital services is factored in. Jurisdictional differences in copyright law can lead to some services being ruled 'illegal' in some countries while retaining their legality in others.[90] When assessing potential illegality of a third party service applying for its zero-rating service, Vidéotron is likely to err on the side of rejection because entering into a partnership with a service that is ultimately found to be illegal may lead to liability for Vidéotron. However, a mistaken assessment of illegality by Vidéotron (as opposed to that of a court) would be discriminatory against that service.

45. Like many digital platforms, music streaming services are characterized by a high degree of service innovation. This leads to many services pushing the boundaries of well-established copyright law. Many of today's most popular services faced significant and existential legal uncertainty in their earlier years of operation. If, in the early days of the Internet, network access providers such as Vidéotron were permitted to discriminate against such services during their years of legal uncertainty, they may never have gained the foothold necessary

[85] *Society of Composers, Authors and Music Publishers of Canada v Canadian Assn.. of Internet Service Providers*, [2004] 2 SCR 427.
[86] M. Geist, "Notice the Difference? New Canadian Internet Copyright Rules for ISPs Set to Launch", December 22, 2014, *MichaelGeist.ca*, <http://www.michaelgeist.ca/2014/12/notice-difference-new-canadian-internet-copyright-rules-isps-set-launch/>.
[87] "Google Grabs Videos and Legal Uncertainty", *Financial Times*, October 11, 2006, <http://www.ft.com/cms/s/0/6493ee4c-58c4-11db-b70f-0000779e2340.html>.
[88] J. Blevins, "Uncertainty as Enforcement Mechanism: The New Expansion of Secondary Copyright Liability to Internet Platforms", (2013) 34 *Cardozo L Rev* 1821, <http://www.cardozolawreview.com/content/34-5/BLEVINS.34.5.pdf>, p. 1831.
[89] <http://www.businessinsider.com/grooveshark-is-the-best-streaming-site-2013-8>.
[90] J. Samuels, "Rojadirecta: The Government Reverses Course and Returns Domains Without Explanation. Again", *EFF.org*, August 29, 2012, <https://www.eff.org/deeplinks/2012/08/rojadirecta-government-reverses-course-and-returns-domains-without-explanation>.

to establish themselves as the legitimate platforms they are today.

### (c) Conclusion

46. In summary, while putatively 'open to all platforms' on a 'no cost' basis, Vidéotron's Unlimited Music zero rating service facially discriminates against vast categories of services and has potential to discriminate against more. It also confers significant and undue preferences onto Vidéotron and provides avenues for further preference. It undermines conditions that are integral to the innovative nature of digital platforms and, for that reason, should be prohibited.

## III. Other potential implications of Vidéotron's Unlimited Music service

47. In addition to the innovation and competition harms that result from Vidéotron's discriminatory and preferential zero rating service, zero rating services such as Unlimited Music can also be harmful to other important policy objectives. It can undermine privacy as well as the security of participating services. As noted above, the operation of a zero rating service entails tracking of customer activity – usage of specific applications – that network access providers such as Vidéotron typically do not have access to.[91] There is, additionally, the potential that Vidéotron is using information gathered in this manner for customer profiling purposes, further implicating user privacy.[92] In addition, as noted above, traffic classification initiatives such as those required for zero rating services often operate to prevent the adoption of strong traffic encryption in order to facilitate identification of the services being used so that they can be zero rated.[93] If so, this would constitute undermining of the quality of the telecommunications services in question.

### Conclusion

48. In conclusion, Vidéotron's Unlimited Music aero rating service undermines a number of policy objectives, is unduly preferential and unjustly discriminatory. We therefore

[91] See para 17, above.
[92] See para 35, above.
[93] See paras 18-20, above.

respectfully ask that you approve the Part I applications that initiated these proceedings.

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