Abridged

BEFORE THE CANADIAN RADIO-TELEVISION AND TELECOMMUNICATIONS COMMISSION

IN THE MATTER OF AN APPLICATION BY CANADIAN NETWORK OPERATORS CONSORTIUM INC.

SEEKING EXPEDITED RELIEF TO ADDRESS IMPLEMENTATION OF THE CAPACITY MODEL APPROVED IN TELECOM REGULATORY POLICY CRTC 2011-703

COMMENTS OF

BELL ALIANT REGIONAL COMMUNICATIONS, LIMITED PARTNERSHIP AND BELL CANADA

06 FEBRUARY 2012

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E1. In Telecom Regulatory Policy CRTC 2011-703, *Billing practices for wholesale residential high-speed access services* (TRP 2011-703), dated 15 November 2011, the Commission approved a capacity-based billing (CBB) model that effectively removed the usage costs from the Gateway Access Service (GAS) residential tariff per end-user access rates and introduced a new network capacity charge to be ordered by Internet service providers (ISPs) in 100 Mbps increments. The Commission directed the Companies to implement the approved capacity model on 1 February 2012. Coincident with the issuance of TRP 2011-703, the Commission also issued Telecom Regulatory Policy CRTC 2011-704, *Billing practices for wholesale business high-speed access services* (TRP 2011-704), in which the Commission found that the existing flat rate tariff structure for business high-speed access services that includes usage on a flat rate basis remains appropriate.

E2. In the Companies' view, realm splitting was the only practical solution to implementing CBB in the two month timeframe mandated by the Commission in TRP 2011-703. However, the Canadian Network Operators' Consortitum (CNOC) filed an Application seeking relief from certain key aspects of the Companies proposed implementation plan (the CBB model) which clearly seeks: (i) changes to the approved capacity model in order to implement a model closer to its proposed, and rejected by the Commission, 95th percentile model; and (ii) modifications to the Companies high-speed architecture that would translate into significant costs and delays to implement CBB, all while another CBB model was implemented within the Commission mandated timeframes.

1.02 Realm Splitting is not Something New or Unique to CBB Nor is it Overly Burdensome

E3. Realm-splitting is not something new. In fact, it is no more complicated than changing an end-user's router's password. ISPs may request users to change realms for various reasons and the Companies note that Vaxination even referred to experiencing a realm change unrelated to CBB in the recent past.[1] Many ISPs have already established multiple realms (there are over # active realms for a total # ISPs on the

[1] See Letter from Vaxination to the CRTC dated 20 December 2012, *Bell Canada's request for extension in filing full GAS tariffs in compliance with CRTC 2011-703 Part Deux*.

Companies' network) and thus, already have demonstrated the means to separate their residential traffic from their business traffic, or for whatever other purposes ISPs have deemed appropriate.

E4. Moreover, a significant portion of ISPs have already implemented the Companies' proposed CBB model and to the extent costs or delays would result from realm-splitting, it would only affect a very small minority of end-users. If those few ISPs need time to implement realm-splitting, then the Commission may consider a reasonable extension of the interim regime in order to accommodate those ISPs. However, the Commission must not mandate yet another costly implementation of CBB, nor should it allow CBB to apply to business traffic.

1.03 <u>Managing Two Models In Parallel Creates Gaming Opportunities And Undermines The Goals Of The Capacity-Based Model</u>

E5. In Decision 2012-60, the Companies note that the Commission has in effect introduced, albeit on an interim basis, a new model to be managed in parallel with the Companies own proposed means of implementing TRP 2011-703 and required the Companies to allow ISPs to choose to be billed in accordance with one or the other. In particular, the Commission allowed ISPs to choose either to realm split and pay CBB only on residential traffic and a flat rate for business access end users, or to combine residential and business traffic onto the same realm, pay CBB for all traffic types, but receive a 10% discount off their business access rates (the CBB on Business Model).

E6. Managing two models in parallel, (i.e. the business flat rate model and the CBB on Business Model) will inevitably create gaming opportunities for ISPs and undermine the goals behind the CBB model. CBB is an economic internet traffic management practice (ITMP) introduced to create financial incentives for ISPs to manage their capacity while allowing the Companies to recover their costs for the capacity used on their networks. In the Companies' view, having two models in parallel will simply undermine the goal behind the application of the CBB model.

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E7. The CBB on Business Model allows ISPs who decide not to split their traffic to benefit from a 10% discount for their business end-users to account for what the Commission referred to as "potential double-counting for business usage". Since the Commission offered ISPs this option, not one of the ISPs that subsequently cancelled their planned realm splitting as a result of the Decision (i.e., ISPs that had planned to realm split their traffic but chose not to and instead sought to take advantage of the 10% discount on the

business access rates), ordered additional CBB. What this clearly indicates is that the capacity these ISPs had ordered from the Companies initially for their residential customers is also sufficient to address the traffic for their business end-users. In effect, the Commission has ordered a windfall for ISPs with business end-users.

E8. Mandating two options will only exacerbate the arbitrage opportunity. ISPs with low volume users, will choose the CBB option. ISPs with high volume users will choose the unlimited option. The usage assumptions built into the existing business GAS rate are based on average users, not only high users. Adopting the two models would require a complete rethink of the assumed average usage for the unlimited usage option. The existing business access rate would clearly have to be increased significantly. But whatever rate is ultimately chosen, the ISPs would always be able to arbitrage the difference between these two rates in order to decrease their payments to the Companies. The Companies further note that allowing the implementation of CBB on business traffic is inconsistent with the Companies' objectives and also contradicts the Commission's statements to a Parliamentary Committee which examined the issue of economic ITMPs.

1.04 Applying CBB on Business Traffic Contradicts The Commission's Statements Before the Parliamentary Committee

E9. After the Commission approved the Companies' UBB charges, the public's outcry led the Government to initiate a review of the matter in February 2011. The Commission, the Companies and the ISPs were called before a Parliamentary Committee to present their views on the issue. There was significant concern that the Canadian economy might suffer and that innovation would be slowed down if Internet usage were applied on Internet traffic. During this review, the Companies, represented by Mirko Bibic, reassured the Parliamentary Committee that the charges were not meant to apply to business traffic. Similarly, the Commission Chairman repeatedly reassured the Parliamentary Committee that charges would not be applied on business traffic.[2]

E10. Clearly, proposing any model which imposes charges on business traffic would be inconsistent with the Commission's recent statements meant to alleviate a Parliamentary Committee's concerns regarding the implementation of economic ITMPs.

1.05 CNOC's Proposal is an Attempt to Reintroduce the 95th Percentile Model

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[2] Standing Committee on Industry, Science and Technology, 3 February 2011, Mr. Konrad W. von Finckenstein at pages 4, 9 and 14.

E11. In its Application, CNOC is requesting changes which basically amount to an attempt on CNOC's behalf to introduce features of the 95th percentile model under false pretenses. CNOC is asking for: i) unrealistically fast capacity changes (real-time or in less than two days compared to the three week interval the Companies have determined it will take[3]) and ii) for changes to the Companies' high-speed architecture in order to allow ISPs to aggregate and manage capacity across Aggregated High-Speed Service Provider Interface (AHSSPI) in a manner that provides them "network redundancy and load balancing without having to pay for excess capacity that will never be used."[4]

E12. The Companies note that their proposed provisioning timeframes are based on the realities of the Companies' networks and input by subject matter experts. The Companies further note that these timeframes are consistent with the provisioning timeframes proposed by other carriers. The Commission must see these arguments for what they are, an attempt to reintroduce 95th percentile. With very short or real-time provisioning intervals, ISPs could change capacity requirements almost in sync with daily fluctuations in usage such that the maximum an ISP would pay would be equal to its peak usage in a given period, as envisaged by the 95th percentile model. CNOC is simply trying to avoid having to predict how much capacity it needs and thus shift back this responsibility to the ILECs, contrary to the Commission's determinations in TRP 2011-703.[5]

E13. Similarly, CNOC's request to be allowed to order an overall capacity across all interfaces is simply a means to shift responsibility back onto the Companies and attempt to achieve a 95th percentile model. CNOC proposes to introduce a dynamic Radius architecture to allow ISPs to manage their capacity on an aggregated basis. However, the Companies note that while the ISPs would have more flexibility to manage capacity, the capacity increments would still have to be ordered from the Companies on a per AHSSPI basis. That is simply the nature of how the Companies' high-speed network functions. Moreover, CNOC's argument that it "should not be forced to pay for twice the capacity they need in order to obtain redundancy and load balancing functionalities" was brought up during the proceeding leading to TRP 2011-703 and fully considered by the Commission. As noted by (then) vice-chair Commissioner Katz, the "ILECs and the cablecos are building networks that they may not be initially using, but will need at some

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3 CNOC Application, paragraph 54.

4 CNOC Application, paragraph 47.

5 TRP 2011-703, paragraphs 54 and 55.

point in time."[6] The (then) CRTC Chairman similarly noted that a capacity model shifts the business risk of provisioning appropriate capacity, including redundant capacity, onto the ISPs.[7]

1.06 The Implementation of DPI or Dynamic Radius to Segregate Traffic Would be a Lengthy Multi-million Dollar Endeavour Simply to Avoid Realm Splitting for a Minority of End-users

E14. CNOC argues that the Companies should use other techniques such as deep packet inspection (DPI) or dynamic Radius to segregate business and residential traffic.[8] The Companies have already announced they have stopped deploying DPI equipment in their networks and are also withdrawing their technical ITMPs from their high-speed services effective 1 March 2012. Implementing a dynamic Radius solution would represent replacing the Companies' high-speed service architecture and would impose significant costs on the Companies. Although the costs have not been fully assessed at this time, based on experience, the Companies estimate that introducing this new architecture as well as the additional correlation tools (described below) which would be required to manage the CBB model would cost millions of dollars (in the order of $ # for the architecture and $ # for the development of correlation tools). The development of the architecture and additional correlation tools represent significant upfront costs and are not usage driven. Therefore, to recover these costs, the Companies would have to update and increase their high-speed access rates. In addition,

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implementing dynamic Radius could take approximately one year to implement in the Companies' network. In light of the difficulties associated with implementing dynamic Radius for CBB and considering that realm splitting is not as disruptive as CNOC claims, the Companies submit that replacing the Companies' architecture with dynamic Radius is not warranted.

1.07 CNOC's Alternative Implementation Proposals Must be Dismissed

E15. CNOC is attempting to shift the responsibility for appropriate capacity provisioning back onto the Companies while also reintroducing 95th percentile. By purchasing capacity across all interfaces and allowing for near real-time capacity changes, CNOC is essentially seeking to limit its members' expenses to their maximum overall peak traffic throughput, as was proposed for 95th percentile. CNOC should not be allowed to

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6 Transcript, Volume 5, paragraph 5400.

7 Transcript Volume 5, paragraphs 5415-5417 and 5420.

8 CNOC Application, paragraphs 35 and 36.

introduce the 95th percentile model under the guise of technical implementation difficulties when it is clear that CNOC's arguments regarding the time intervals to implement capacity increments and paying for redundant capacity were already considered by the Commission. In any case, the implementation of dynamic radius as proposed by CNOC would be a lengthy multi-million dollar endeavour simply to avoid realm-splitting for a small minority of end-users. For all of these reasons, CNOC's alternative implementation proposals should be dismissed.

1.08 <u>Conclusion: Extending the interim regime</u>

E16. The Companies acknowledge that the implementation of realm splitting by ISPs, although not cost prohibitive, may take some time to implement. In light of the fact that the Companies' CBB solution is already in effect and implemented and given that there is a parallel model to accommodate those ISPs that have not yet segregated their traffic, the Companies propose that the Interim regime (including allowing ISPs to either choose the Realm splitting model, or the CBB on Business Model) be extended for a reasonable length of time up to a maximum period of 1 year from the implementation deadline of 1 February 2012 (i.e., until 1 February 2013). This should provide those ISPs who would wish to segregate their traffic, but could not by the 1 February 2012 with sufficient time to implement realm splitting. To be clear, at the end of that period, all ISPs that have a mix of both residential and business end users would be required to have instituted realm splitting unless an ISP determines that their business end-users have a negligible impact on their peak traffic and choose to incur CBB on their commingled business and residential traffic. After that date, the discount on business access rates for end users that are carried over CBB charged realms would cease to apply. As for the final rate for the Interim period for CBB on Business end users, the Companies submit that the Commission should replace the 10% discount with a revenue neutral rating methodology set out in Section 3.3 below.

2.0 INTRODUCTION

1. Bell Aliant Regional Communications, Limited Partnership and Bell Canada (collectively, the Companies) are in receipt of an Application dated 4 January 2012 filed by the Canadian Network Operators Consortium Inc. (CNOC) pursuant to Part 1 of *the Canadian Radio-television and Telecommunications Commission Rules of Practice and Procedure* (the Application) and the Commission's 3 February 2012 letter revising the process asking interested parties to comment on the Application, on the Commission's interim model set out in Telecom Decision CRTC 2012-60[9] using a single realm to support traffic splitting in conjunction with a 10 percent reduction in the access rate for business Gateway Access Service (GAS) and its viability as a longer term solution, and propose, as necessary, other economic solutions that address traffic splitting. The following constitute the Companies' comments.[10]

2. In Telecom Regulatory Policy CRTC 2011-703, *Billing practices for wholesale residential high-speed access services* (TRP 2011-703), dated 15 November 2011, the Commission approved a capacity-based billing (CBB) model that effectively removed the usage costs from the GAS per end-user access rates and introduced a new network capacity charge to be ordered by ISPs in 100 Mbps increments. The Commission directed the Companies to implement the approved capacity model on 1 February 2012. Coincident with the issuance of TRP 2011-703, the Commission also issued Telecom Regulatory Policy CRTC 2011-704, *Billing practices for wholesale business high-speed access services* (TRP 2011-704), in which the Commission found that the existing flat rate tariff structure for business high-speed access services that includes usage on a flat rate basis remains appropriate.

3. Today, Internet service providers (ISPs) aggregate their traffic from multiple services on their AHSSPIs and thereby often combine residential and business traffic. As a result of the application of capacity-based billing for residential and not business traffic, in cases where ISPs co-mingle residential and business traffic on the same AHSSPI, the need arises for the separation of residential and business traffic. Alternatively, an ISP can elect to incur the residential capacity charge for all its traffic regardless of whether it is residential or business traffic.

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9 Telecom Decision CRTC 2012-60, Implementation date for the wholesale high-speed access services capacity model approved in Telecom Regulatory Policy 2011-703 (Decision 2012-60).

10 The Companies' references to wholesale high-speed services in this document relate to the Companies' GAS services in Ontario and Québec. Bell Aliant in the Atlantic region does not apply capacity charges to its wholesale high-speed services.

4. In order to implement TRP 2011-703 in the short timelines established by the Commission and achieve the separation of residential and business traffic on the same AHSSPI, the Companies proposed, in accordance with CNOC's own proposal[11], an implementation plan which called for ISPs to use distinct realms for their traffic from business end-users and for their traffic for residential end-users. In fact, the Companies went even further by also offering to ISPs, in the case of Internet Protocol (IP) AHSSPIs, the option to segregate their business and residential traffic on their existing interfaces rather than having to dedicate interfaces either to business or residential use. As noted in the Companies' 19 December 2012 tariff filing[12], separation of traffic is not required in cases where an ISP's traffic is exclusively residential or business traffic. Furthermore, in cases where the ISP's traffic consists primarily of residential traffic with a smaller portion of business traffic, the ISP may elect to continue to co-mingle its residential and business traffic on its AHSSPI.

5. In the Companies' view, realm splitting was the only practical solution to implementing CBB in the two month timeframe mandated by the Commission in TRP 2011-703. However, CNOC filed an Application seeking relief from certain key aspects of the Companies proposed implementation plan. Specifically, CNOC objects to: (i) the requirement for realm splitting and instead proposes the use of dynamic Radius servers and a requirement for the Companies to provide real-time mapping between the ISPs end-users usernames and associated telephone numbers (for auditing purposes), (ii) the inability of ISPs to order capacity and manage it dynamically across multiple AHSSPIs, (iii) the length of the capacity ordering intervals proposed by the Companies, and lastly, (iv) CNOC states that ISPs should not be charged for 155 Mbps of capacity on legacy OC-3 interfaces since in CNOC's view, those interfaces only support 130 Mbps of IP traffic.

6. Clearly, CNOC now seeks: (i) changes to the approved capacity model in order to implement a model closer to its proposed, and rejected by the Commission, 95th percentile model, and (ii) modifications to the Companies high-speed architecture that would translate into significant costs and delays to implement CBB, all while another CBB model was implemented within the Commission mandated timeframes. Surprisingly, CNOC insisted that the implementation of TRP 2011-703 not be delayed arguing that ISPs have waited a long time to high speed access services even though

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[11] The Companies note in this respect that during the proceeding leading to TRP 2011-703 CNOC had proposed that, in the event the Commission opted for a different rate for residential traffic than business, that this be resolved by separating traffic on different interfaces. See Section 5.1 below.

[12] See the Companies' letter associated with Bell Aliant Tariff Notice 391 and Bell Canada Tariff Notice 7338.

ISPs have had access to these services since 12 July 2011. CNOC even indicated it found the capacity rates approved by the Commission to be excessive but this "will be addressed separately". Nevertheless, CNOC asked the Commission to move forward with the implementation.

7. The Companies note that the revenues they can expect under the CBB model (combining the revenues from the access rates and those of the capacity increments ISPs will order) are actually less than the revenues they were obtaining before. In effect, the new model approved by the Commission results in savings for the ISPs, which would explain CNOC's interest in proceeding with a faster implementation as opposed to waiting until the issues it raised in its Application are addressed.

8. In Decision 2012-60, the Companies note that the Commission has in effect introduced, albeit on an interim basis, a new model to be managed in parallel with the Companies own proposed means of implementing TRP 2011-703 and required the Companies to allow ISPs to choose to be billed in accordance with one or the other. In particular, on 27 January 2012 the Commission issued Decision 2012-60 in which it required the Companies to maintain their proposed implementation of TRP 2011-703 by 1 February 2011 and also to:

> a. Allow independent ISPs to use a single realm to support both residential and business traffic. Independent ISPs would be required to purchase the appropriate capacity in 100 megabits per second increments to carry their combined residential and business traffic using the rates for the approved capacity model.
>
> b. Allow independent ISPs an initial order for the capacity to carry the combined residential and business traffic required on the implementation date at no charge.
>
> c. Provide compensation to independent ISPs to recognize the potential double-counting for business usage through a reduction set at 10 percent of the monthly business rate access charges for independent ISPs.[13]

9. In these Comments, the Companies will refer to this second option as the "CBB on Business Model", i.e. where usage is removed from the business access rate and replaced with the ISP ordering CBB for both its residential and business traffic.

10. The Companies will address in the following sections CNOC's concerns as well as the use of economic solutions (such as the one mandated in Decision 2012-60) as a longer term solution. First, in Section 3.0, the Companies provide their comments on the Commission's Interim Model and address the issues related to managing two models in

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[13] Decision 2012 60, paragraph 24.

parallel and why the CBB on Business Model should not be applied as a longer term solution.

11. Second, in Section 4.0, the Companies address CNOC's requests for shorter provisioning time frames and ordering capacity on a per AHSSPI basis. The Companies highlight the fact that these requests are nothing more than an attempt to introduce features of the 95th percentile model, a model that was rejected by the Commission, and why, in any event, it is not possible for the Companies to meet these requests.

12. Third, in Section 5.0, the Companies discuss why realm splitting remains the most appropriate approach to implement the CBB model and provide data that indicates realm splitting is not as disruptive as CNOC claims. Also discussed in that Section is why the architecture changes requested by CNOC involving the introduction of dynamic Radius is not warranted or even a viable alternative to realm splitting.

13. Next, in Sections 6.0 and 7.0, the Companies address CNOC's requests for real-time mapping tools, which unfortunately, is not technically feasible, and the fact that overhead is already factored into the Companies' cost studies and therefore do not warrant a rate reduction as requested by CNOC.

14. Finally, in Section 8.0, the Companies propose extending the interim regime to provide additional time to implement the CBB model for those ISPs that did not split their traffic.

15. Certain information contained in the Companies' Comments is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act*. This information is disaggregated and the Companies consistently treat such information as highly confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice the Companies' competitive position, result in material financial loss and cause specific direct harm to the Companies. An abridged version of the Companies' Comments is provided for the public record.

3.0 THE COMMISSION'S INTERIM MODEL

16. The Companies do not support the application of the Interim Model mandated as a result of Decision 2012-60 for a number of reasons which will be explained below.

3.01 Managing Two Models In Parallel Creates Gaming Opportunities And Undermines The Goals Of The Capacity-Based Model

17. Managing two models in parallel, (i.e., the business flat rate model and the CBB on Business Model the Commission mandated in Decision 2012-60) will inevitably create gaming opportunities for ISPs and undermine the goals behind the CBB model.

18. A few years ago, the Companies filed an application with the Commission to introduce an economic Internet Traffic Management Practice (ITMP) on their residential wholesale high-speed Internet traffic (then called usage-based billing or UBB). The Companies noted that wholesale ISPs' residential end-users accounted for a disproportionate amount of traffic on their networks compared to their retail residential end-users. Because of the way the high-speed architecture and the GAS tariffs were developed, certain ISPs were able to use a lot more traffic than other ISPs without having to pay any differently. The Companies' intent behind the economic ITMP was to create financial incentives for ISPs to manage their capacity while allowing the Companies to recover their costs for the capacity used on their networks. After much iteration, the Companies are now able to charge for capacity and recover the costs of capacity from ISPs. Although the model changed from a usage model to a capacity model, the goal behind the economic ITMP remains the same for the Companies; that is, to create the appropriate incentives for ISPs to manage the capacity used on the Companies' network efficiently and to have ISPs contribute financially in a manner that is proportionate to the capacity used.

19. In the Companies' view, having two models in parallel will simply undermine the goal behind the application of the CBB model. The CBB on Business Model allows ISPs who decide not to split their traffic to benefit from a 10% discount for their business end-users to account for what the Commission referred to as "potential double-counting for business usage". However, the Companies believe there is no such double-counting of usage. Since the Commission offered ISPs this option, not one of the ISPs that subsequently cancelled their planned realm splitting as a result of the Decision (i.e., ISPs that had planned to realm split their traffic but chose not to and instead sought to take advantage of the 10% discount on the business access rates), ordered additional CBB. What this clearly indicates is that the capacity these ISPs had ordered from the Companies initially for their residential customers is also sufficient to address the traffic for their business end-users. This is likely explained by the fact that business end-user traffic typically tends to peak during the day as opposed to during the evening like most

residential traffic does. In effect, the Commission has ordered a windfall for ISPs with business end-users.

20. The Companies submit that the Commission should not mandate two options for business end-users on a regulated basis (the business flat rate model approved in TRP 2011-704 and the CBB on Business Model). Mandating two options will only exacerbate the arbitrage opportunity. ISPs with low volume users will choose the CBB option. ISPs with high volume users will choose the unlimited option. The usage assumptions built into the existing business GAS rate are based on average users, not only high users. Adopting the two models would require a complete rethink of the assumed average usage for the unlimited usage option. The existing business access rate would clearly have to be increased significantly. But whatever rate is ultimately chosen, the ISPs would always be able to arbitrage the difference between these two rates in order to decrease their payments to the Companies.

21. As will be discussed further in the following sections, providing ISPs with an option not to split their traffic is unnecessary because splitting traffic is not as disruptive as CNOC claims and CNOC itself had even proposed it during the proceeding. Therefore, the Companies believe that providing a discount for business end-users over any extended period of time is inappropriate and should not be contemplated as a longer term solution.

22. Having addressed the problems with the Interim Model, and adopting the CBB on Business Model as a long term solution, the Companies are not proposing that the Commission withdraw the Interim Model at present. In fact, as discussed in Section 8.0 below, if the Commission agrees to adopt the Companies realm splitting approach as the final model, the Companies propose that the Interim Model be maintained for a period of up to one year period to allow for an orderly transition for those ISPs that have not yet split their realms and wish to do so.

3.02 <u>The CBB on Business Model Applied As a Longer Term Solution Contradicts the Commission's Statements Before the Parliamentary Committee</u>

23. The Companies have maintained, over the past few years, that usage charges (and now CBB charges) should not be applied to business end-users. The Commission also recently recognized in TRP 2011-704 that the existing flat-rate model remains appropriate for business traffic.

24. After the Commission approved the Companies' UBB charges, the public's outcry led the Government to initiate a review of the matter in February 2011. The Commission, the

Companies and ISPs were called before Parliament to present their views on the issue. There was significant concern that the Canadian economy might suffer and that innovation would be slowed down if Internet usage were applied on Internet traffic. During this review, the Companies, represented by Mr. Mirko Bibic, reassured the Parliamentary Committee that the charges were not meant to apply to business traffic:

> First, Bell has applied usage-based billing for retail Internet services we offer in our competitive footprint since December 2006.
>
> With respect to another general misunderstanding, I also want to point out that the CRTC decision does not impact Internet services for businesses, large or small.[14]

25. Similarly, the CRTC Chairman, reassured the Parliamentary Committee that charges would not be applied on business traffic:

> Now you should know that nearly all large distributors have introduced usage-based billing for their residential customers—Bell, for example, adopted this billing practice in 2006. And I would like to point out that usage-based billing applies only to residential customers; it does not apply to business customers
> …
> Let me now address our usage-based billing decisions. I would ask that you keep in mind that this billing practice applies only to residential customers and not to businesses.
> …
> Secondly, in terms of Internet traffic, there are no caps for business. If you want a business, you go and you make your deal with your provider, depending on your use. We're talking only about residential here, and I made that clear.
> …
> First of all, we're only talking about residential. We're not talking about commercial, okay? This is the decision before us.
> …
> The business market does not have caps. It is on a one-to-one basis with each business. They negotiate how much a business would need and negotiate the price for it. For consumers you don't do it on a one-to-one basis. Basically there are different menus and you ask them to choose from it because of the sheer numbers.[15]

26. Thus, proposing any model which imposes charges on business traffic would be inconsistent with the Commission's recent statements meant to alleviate the Parliamentary Committee's concerns regarding the implementation of economic ITMPs as well as the Commission's own recent directive in TRP 2011-704.

3.03 Setting the Right Interim Rate for the CBB on Business Model

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[14] Standing Committee on Industry, Science and Technology, 10 February 2011, page 15.

[15] Standing Committee on Industry, Science and Technology, 3 February 2011, Mr. Konrad W. von Finckenstein at pages 4, 9 and 14.

27. The Companies are not in this proceeding proposing any changes to the access and CBB rates set out in TRP 2011-703 and TRP 2011-704 for the realm splitting. However, in Decision 2012-60, the Commission applied a 10% discount to the existing business access rates for ISPs that adopt the CBB on Business Model. The Companies submit that the interim 10% should be adjusted to the proper business access rate that excludes usage, as further explained below.

28. In setting a business access rate which excludes the usage component, the Commission needs to consider the following factors: First, the Commission has approved rates for wholesale high-speed access services for business that have a higher mark-up than residential wholesale high-speed access services. Thus, the Commission has rejected the notion that the mark-up for business and residential are the same. Second, in setting a rate for business access excluding the usage component, the Commission must ensure that the resulting rate is revenue neutral compared to the revenue generated from the existing approved business rate for both fibre-to-the-node (FTTN) and legacy GAS (which include access and usage). In this regard, the Companies note the Commission's 10% price decrease appears to a rough estimate of such a calculation. But in setting a final rate for the Interim period, the Commission must consider that business usage revenue will be captured in the CBB rate. This rate reflects the residential mark-up of #. The mark-up the Commission has approved for business is #. Therefore, the business revenue will be short by the amount equal to # mark-up on usage (business mark-up of # on usage less the mark-up in the CBB of #). To ignore this reality and set the business access rate at costs plus the # mark-up will effectively result in an unwarranted price decrease to the benefit of ISPs.

29. The Commission can achieve revenue neutrality by incorporating the missing # mark-up from business usage by increasing the business access rate in the amount equal to the

mark-up on business usage. The Commission must factor in the missing mark-up in the calculation of the business access rate to achieve the desired results of maintaining revenue neutrality in a permanent rate for business access.

3.04 CNOC Agreed to Separate Interfaces

30. It appears that the primary purpose that the Commission adopted the CBB on Business Model was, for ISPs that did not wish to do so, to avoid having to realm split, effectively preventing them (at least for the time being) from having to separate their business from their residential traffic. Below in Section 5.2, the Companies describe how CNOC has

over-exaggerated the complications with the Companies' proposed method of separating their traffic. Further, and more importantly, the Companies point out that CNOC itself noted that it would be prepared to split their traffic between residential and business by sending them to separate interface points.[16] This was clearly an important factor that allowed the Commission to adopt the CBB model in TRP 2011-703. As such, and for the reasons noted above, the Companies are strongly opposed to the adoption of the CBB on Business Model.

3.05 Conclusion on CRTC Interim Model

31. For all of these reasons, the Companies request the final approval of their proposed implementation of CBB and that no other model be approved in parallel. However, as discussed below in Section 8.0, the Companies are not proposing that the Interim regime be

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ended immediately. Instead, the Companies propose that the Commission adopt the Companies realm splitting approach as the final model, and that the Interim Model be maintained for up to one year to allow for an orderly transition for those ISPs that have not yet split their realms and wish to do so.

4.0 CNOC'S PROPOSAL IS AN ATTEMPT TO REINTRODUCE THE 95TH PERCENTILE MODEL

32. In its Application, CNOC is requesting changes which basically amount to an attempt on CNOC's behalf to introduce features of the 95th percentile model under false pretenses. CNOC is asking for: i) unrealistically fast capacity changes (real-time or in less than two days compared to the three week interval the Companies have determined it will take[17]), and ii) for changes to the Companies' high-speed architecture in order to allow ISPs to aggregate and manage capacity across AHSSPI interfaces in a manner that provides them "network redundancy and load balancing without having to pay for excess capacity that will never be used."[18] These arguments will be addressed in the following sections.

4.01 Capacity Provisioning Takes Time

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16 CNOC's 24 May 2011 response to CNOC(The Companies)29Apr11-4 TNC 2011-77.

17 CNOC Application, paragraph 54.

18 Ibid., paragraph 47.

33. In its Application, CNOC requests that the Commission order the Companies to implement changes to network capacity ordered by ISPs either in real time or no later than two business days after such a request is made. This is in sharp contrast to the three week implementation period proposed by the Companies in their 16 January 2012 service charge filing.

34. With very short or real-time provisioning intervals, ISPs could change capacity requirements almost in sync with daily fluctuations in usage such that the maximum an ISP would pay would be equal to its peak usage in a given period, as envisaged by the 95th percentile model. In the Companies' view, CNOCs desire to have very short provisioning intervals for changes in network capacity is nothing more than a thinly veiled attempt to circumvent the intent of the Commission's approved capacity-based model – where ISPs are expected to estimate and pre-order capacity – and instead restrict capacity charges to peak usage levels (i.e., the 95th percentile capacity model, which was rejected by the Commission in TRP 2011-703):

> With respect to CNOC's concern that independent service providers would be required to estimate and predetermine capacity under the MTS Allstream capacity model, the Commission considers that such a requirement appropriately shifts to the independent service providers the risk and responsibility associated with planning and managing the impact their customers will have on the network providers' networks. This contrasts with the 95th percentile capacity model, where the network provider would assume all responsibility to predict and manage the independent service provider's usage of its shared network.
>
> In light of the above, the Commission considers that the MTS Allstream capacity model is more appropriate than the 95th percentile capacity model.[19]

35. In any event, CNOC's request for either real time capacity provisioning or provisioning within two business days deliberately ignores the complexities that exist in processing an order related to increasing or decreasing network capacity. As noted in the Companies 16 January 2012 service charge filing[20], a three-week period to implement a customer request to change its capacity is necessary for the Companies to complete a number of functions, which include: acceptance of the customer's order of the customer's order by service representatives; verification by technical staff of access to the virtual local area network (VLAN) and network facilities; assignment of the VLAN and path identifier; and confirmation of the path configuration and configuration of the distribution router for the appropriate capacity. In fact, the Companies note that Cogeco and Vidéotron proposed similar provisioning intervals.

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19 TRP 2011-703, paragraphs 54 and 55.

20 See the following Tariff Notices: BA390A and BC7337A.

36. During the oral hearing, parties mentioned more than once that it takes time to get more capacity.[21] ISPs already know that that it is not a two-day process, let alone a real-time one. By asking for real-time capacity changes, CNOC is simply trying to avoid having to predict how much capacity it needs and thus shifting back this responsibility to the ILECs.

37. The Commission's approved CBB model was clearly not intended to result in 95th percentile capacity billing and for this reason, and the reality that it is not possible for the Companies to implement capacity increments in such short timeframes, CNOCs request for real time provisioning or provisioning within two business days should be disregarded. In addition,

[21] Transcript, Volumes 3 and 5, paragraphs 3403 and 5451.

38. the Companies' proposed service charge associated with ordering network capacity in increments of 100 Mbps and the required implementation intervals are subject to a separate process and should be dealt with in that forum and not as part of CNOC's Application.

4.02 Capacity must be ordered on a per interface basis due to the realities of the network

39. CNOC argues that ISPs "should not be forced to pay for twice the capacity they need in order to obtain redundancy and load balancing functionalities."[22] However, the Commission must see these arguments for what they are, an attempt to introduce the 95th percentile model. Rather than pay for the capacity of their links, CNOC would like ISPs to be able to correlate the pre-purchased CBB to their peak usage across all interfaces. This effectively is the 95th percentile model. As TekSavvy's Mark Gaudrault, appearing on behalf of CNOC, described during the oral proceeding leading to TRP 2011-703:

> MR. GAUDRAULT: [...] So TekSavvy, **we have 20 1 gig links** and we have been telling Bell for a long time now we would love to go to 10 gig ports. **So let's say we are using 18 gigs, we need to buy a third 10 gig port. So in this case we would be paying for a full 10 gig port that we are not using.** So that's a big problem.
>
> COMMISSIONER KATZ: But they ILECs and that cablecos are building networks that they may not be using initially, but will need at some point in time.
>
> MR. GAUDRAULT: But this is the case, that **I'm not causing 30 gig of traffic on their network, I'm causing 18.** That hasn't happened. They have given me a port and as it gradually goes up I'm going to start using it.
>
> So **the issue is that, you know, charge me for what I'm using.** So the 95th is the equivalent to looking at the flowthrough, the pipe, and like if you could just see it, oh, there's the peak. **Here's the whole pipe and they are using half of it, okay.** Right? So that's the least intrusive. **That's what 95th amounts to.**
>
> Usually you top off the 5 percent just because there's little squiggles, you know.
>
> But that's effectively what 95th is, it's the least most obvious like to tell you how much are you using of that pipe. If you were to give me a rough estimate of that pipe, how much you are using, **that is what 95th does.**[23] [Emphasis added]

40. As previously noted, the Commission has rejected the 95th percentile model and instead approved a capacity-based model which "appropriately shifts to the independent service providers the risk and responsibility associated with planning and managing the impact

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22 CNOC Application, paragraph 44.

23 Transcript, Volume 5, paragraphs 5399 to 5404.

their customers will have on the network providers' networks."[24] It is unsurprising that, in this context, CNOC is attempting to "re-shift" this responsibility back onto the Companies. However, this attempt to reintroduce 95th percentile model must clearly be rejected. In any case, as further described below, capacity must be ordered on a per AHSSPI basis due to the realities of the Companies' network architecture.

41. With the implementation of the capacity-based model, the Companies are asking ISPs to order capacity increments on a per AHSSPI interface basis because the network does not manage capacity on an aggregate basis across multiple AHSSPI interfaces located in various routing and switching equipment and in different cities. ISPs must order from the Companies the amount of capacity they believe they will need in each of their AHSSPIs.

42. To try and manage capacity in an aggregated fashion, as suggested by CNOC, would require what is called "link aggregation" in the industry, a functionality which allows network operators to logically group multiple physical links together to look like one link. This functionality was not implemented in the Companies' high-speed network due to its complexity, especially when there are two network providers involved. It is not possible to use link aggregation on AHSSPI interfaces located on different line cards, routers or switches in order to manage them as one big pipe. AHSSPIs today are provisioned on a basis that assigns them on the next available port in the equipment that has spare space. To try and move AHSSPIs in the same location to manage them in an aggregated fashion would be extremely costly.[25] In addition, by moving ISPs' AHSSPI interfaces so that they can be located in one box, ISPs would lose some of the redundancy they had achieved by ordering interfaces in different central offices.[26]

43. Even if ISPs order additional capacity for redundancy, MTS Allstream Inc. (MTS Allstream) explained that once the capacity is enabled at the interface, ISPs are able to use the capacity in the network.[27] This is also the case in the Companies' networks.

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24 TRP 2011-703, paragraph 54.

25 It would also require moving other retail and wholesale services that make use of the same equipment in order to make space.

26 The Companies' existing high-speed architecture provides a basic and economical way of achieving load balancing and network redundancy. End-users are assigned in a round-robin fashion, as described earlier, and the fact some ISPs order multiple interfaces in different central offices tend to improve load-balancing and redundancy. Although the Companies make no pretense that these functionalities are guaranteed on their networks nor do their tariffs suggest this. If these were guaranteed, the high-speed service architecture would have been designed differently and wholesale high-speed services would cost a lot more. Implementing the CBB model does not fundamentally change ISPs' approach to load-balancing and redundancy.

27 Transcript Volume 5, paragraph 5432.

When ISPs order additional capacity because they want to prepare for potential network failures, this additional capacity is not set aside in the network (nor is it identified as such) and thus ISPs can fully make use of this capacity at any time even if there is no network failure. In fact, idle capacity cannot be set aside, because with round-robin, capacity on all the AHSSPIs eventually gets used. If it was up to the Companies to figure out at the end of the month if capacity was or was not used, then we would be back to a 95th percentile model, where the ISP only pays based on peak. Because ISPs can use this capacity at any given time without the Companies' involvement, ISPs should pay for the ability to use this capacity. Again this is basically an attempt to pay only for the peak traffic at the end of the month as opposed to pre-ordering capacity on the basis that it may be required.

44. ISPs have argued during the hearing that the downside of the CBB model is that capacity will be pre-ordered but may never be used. In particular, CNOC stated that stand-by capacity for redundancy would not drive costs on the incumbents' networks if it was not used and therefore ISPs should not have to pay for it. In the end however, CNOC stated that any capacity-based model would be acceptable:

> MR. ROCCA: So we still believe that 95th is a better model because it actually reflects the actual costs that are imposed in the incumbent network.
>
> **The problem with the essentially flat rate pipe is that it overcompensates the incumbents for usage that is not put onto the network.** It also imposes some additional issues for redundancy. For example, say there was an ISP that needed 500 megabits of aggregate usage, if they wanted to have two redundant gig links, they would actually be paying for 2000 megabits of capacity when they were actually only putting 500 megabits of capacity on the network.
>
> **That said, any capacitybased model is better than any volumebased model, but we strongly believe that the 95th better reflects the costs that we are imposing on the network.**[28] (emphasis added)

45. The redundancy topic was discussed at length during the hearing.[29] The Chairman even pointed out to CNOC that facilities-based providers routinely build capacity they do not "need" and capacity for redundancy is part of the cost of doing business:

> Mr. Rocca, that's twice now you have made this redundant point. I don't get it. If you were building rather than leasing you would take the business risk of building the redundancy or not? If it's not used, you have spent a lot of money for something that you don't need to. Why should it be any different when you are leasing it? I don't get this.

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28 Transcript Volume 5, paragraphs 5357-5359.

29 Transcript, Volume 5 and 6, CNOC at paragraphs 5357 to 5359, CNOC and Distributel at paragraphs 5411 to 5456, BCBA at paragraphs 6356 to 6358 and Mr. Moore at paragraphs 7920 to 7926.

...

> I asked Mr. Rocca about his question of redundancy and he basically says: If I have to use a redundant line I will have to pay for it even if I don't use it. I say that's the risk of business, you have that whether you build or lease. I don't know why because you are leasing you should get a better risk factor.[30]

46. The Companies originally proposed a UBB model. CNOC preferred the 95th percentile model. In the end, the Commission chose a third model, the CBB model proposed by MTS Allstream. The Companies submit that CNOC should not be allowed to introduce the 95th percentile model under the guise of technical implementation difficulties when it is clear that CNOC's arguments regarding the time intervals to implement capacity increments and paying for redundant capacity were already considered by the Commission. As such, CNOC's arguments should be dismissed.

5.0 REALM SPLITTING IS THE ONLY COMMERCIALLY REASONABLE METHOD THAT WOULD ALLOW ISPS TO SEGREGATE BUSINESS TRAFFIC FROM RESIDENTIAL TRAFFIC

47. CNOC argues with regard to the splitting of traffic on different realms that:

i. "it is extremely disruptive and costly for independent ISP end-users to implement, since each end-user whose realm is required to be changed would have to be contacted individually in order to ensure that the end-user can continue to authenticate to its ISP's network",[31]
ii. the Companies are not offering enough free of charge realms since splitting of realms will require most ISPs to "double the number of realms they manage today",[32]
iii. the Companies artificially constrain the number of realms ISPs can order,[33]
iv. the Companies should make use of dynamic Radius to segregate traffic or other means that do not create significant costs.[34]

48. As the Companies will further explain below: i) the Companies do not believe that splitting traffic is as disruptive as CNOC claims because many end-users do not need to change their existing realm; ii) the limit on the number of free realms ISPs can order has been adjusted as explained below; and finally, iii) the implementation of dynamic Radius as suggested by CNOC proposes would introduce more problems than it would solve and is thus not a viable option.

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30 Transcript, Volume 5, paragraphs 5415 to 5417 and 5420.

31 CNOC Application, paragraph 31.

32 Ibid, paragraph 32.

33 Ibid.

34 Ibid., paragraph 35.

5.01 Realm Splitting Was Considered in the Proceeding Leading to TRP 2011-703 and Even Proposed by CNOC

49. As previously noted, the Commission approved in TRP 2011-703 a capacity charge for residential high-speed access traffic but maintained the existing flat rate tariff structure for business high-speed access services in Telecom Regulatory Policy CRTC 2011-704, *Billing practices for wholesale business high-speed access services* (TRP 2011-704). In order to implement CBB in such a way that it applies to residential high-speed access traffic but not to business traffic, ISPs with a mix of residential and business traffic currently on the same AHSSPI need to separate their GAS business traffic from their residential GAS traffic for billing purposes. In order to achieve this, ISPs need to use different realms to allow the traffic to be routed to the appropriate AHSSPI interfaces or the appropriate VLANs.

50. CNOC attempts to portray the separation of traffic as an insurmountable implementation issue alluding that this issue was not considered by the Commission prior to issuing its decision. The Companies note that, on the contrary, this issue was highlighted to the Commission and was also discussed at the hearing. In particular, CNOC was well aware that it was highly probable the Commission would approve capacity or usage charges to be applied on residential traffic but not on business traffic and thus, that traffic would need to be segregated. The Companies note that the Aggregated Volume Pricing (AVP) model they proposed would not have required any separating of business and residential traffic while the 95th percentile and MTS Allstream capacity-based models both require the separation of traffic. The Companies specifically asked CNOC in an interrogatory what it planned to do to separate traffic to implement the 95th percentile model to which CNOC proposed that traffic could be separated on different interfaces "based on the classification of end-user connections."

> If, however, the Commission were to decide to maintain a different rate structure for wholesale services employed by wholesale customers to deliver business or other services, then separate interface points could be implemented – one for "Residence" GAS and one for all other traffic. CNOC believes that the Companies could route traffic to the appropriate interface based on the classification of end-user connections to ensure that "Residence" GAS traffic is not sent over the interface dedicated for all other types of traffic. Should such a process be too cumbersome for any reason, an annual attestation that "Residence" GAS traffic is not sent over the interface dedicated for all other types of traffic could be provided by an officer of each wholesale customer to the Commission.[35]

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35 CNOC's 24 May 2011 response to CNOC(The Companies)29Apr11-4 TNC 2011-77.

51. Moreover, during the oral proceeding, Commissioner Molnar acknowledged that ISPs did not necessarily segregate their business traffic from their residential traffic and enquired whether Primus, one of CNOC's members, would be prepared to do so, to which Mr. Stein on behalf of Primus responded that, although not optimal, they would be prepared

> COMMISSIONER MOLNAR: So you would be prepared to, if you needed dedicated circuits
> MR. STEIN: Yes.
> COMMISSIONER MOLNAR: dedicated links to residence, then that would be reasonable?
> MR. STEIN: If I had to choose an ISP and put only bus on one set and res on another, I would be in doing that I would be denied a very effective, very commonplace in telecom approach, of taking the capacity that I have purchased and using it very effectively. You know, you can point to many examples over the years.
> COMMISSIONER MOLNAR: I do understand it would not be your optimal choice.
> MR. STEIN: That's right.
> COMMISSIONER MOLNAR: But you would be prepared for that?
> MR. STEIN: I would have to look at it closely but if that's
> COMMISSIONER MOLNAR: Yeah, you need to think about it.
> MR. STEIN: I would be prepared.[36]

52. Clearly, the separation of business and residential traffic was considered during the proceeding leading to TRP 2011-703 and it was equally clear at the time that this separation would entail some costs and implementation efforts by the ISPs themselves. CNOC is now attempting to transfer all the costs and effort onto the Companies, no matter how unreasonable its proposed solutions might be.

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[36] Transcript Volume 3, paragraphs 3581 to 3590.

5.02 Realm Splitting is Not Something New or Unique to CBB Nor is it Overly Burdensome

53. At the outset, the Companies note that CNOC has provided no factual evidence to support its arguments on the complexity of realm splitting or with regard to the number of end-users that would be affected. CNOC relies instead on broad statements that the Companies' proposed implementation is burdensome and would require months or potentially years to implement.

54. It must be clarified that realm splitting is not something new and not all end-users need to change realms. ISPs may request users to change realms for various reasons and the Companies note that Vaxination even referred to experiencing a realm change unrelated to CBB in the recent past.[37] In fact, many ISPs have already established multiple realms (there are over # active realms for a total # ISPs on the Companies' network) and thus, already have demonstrated the means to separate their residential traffic from their business traffic, or for whatever other purposes ISPs have deemed appropriate.

55. If an ISP already has segregated its traffic between residential and business end-users under distinct realms (which is the case for some ISPs), then no further realm splitting needs to be done. Moreover, if an ISP has only a few business end-users, that ISP can decide that financially it is better not to segregate its traffic because its business traffic will not have a material impact on its peak traffic because business traffic typically tends to peak during the day as opposed the residential traffic which tends to peak during the evening. With respect to the actual implementation of the CBB model and the CBB on Business Model, the Companies note that out of # ISPs using GAS services from the Companies, # ISPs which either had only business end-users or very few residential end-users decided make other arrangements to become business-only ISPs. For these # ISPs, obviously realm splitting is not an issue. Out of the # ISPs, # ISPs advised the Companies they will not be splitting their traffic (and therefore will pay CBB on their limited business traffic) while # ISPs advised they will be splitting their traffic. For the # ISPs that advised the Companies they will be splitting their traffic even though they were offered not to split it, it appears that realm splitting is not a

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significant implementation issue. For the # ISPs that will not be splitting their traffic, the number of business end-users is not very significant as it only accounts for #% of the

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[37] See Letter from Vaxination to the CRTC dated 20 December 2012, *Bell Canada's request for extension in filing full GAS tariffs in compliance with CRTC 2011-703, Part Deux*.

Companies' GAS customer base (i.e. # end-users). If these ISPs had been forced to realm split their traffic, only the business end-users would have had to change their IDs to be properly routed on a new realm and segregated from the residential traffic. Based on the low number of business end-users that could have to change IDs because of realm splitting, traffic splitting simply is not as significant as CNOC is claiming. As mentioned above, for the ISPs that opted not to split their traffic as a result of the Commission's CBB on Business Model, none of them ordered additional capacity for its business end-users even though the capacity previously ordered was only for their residential traffic. The Commission had intended the 10% discount to compensate ISPs for potential double-counting of business usage. However, the fact the ISPs have not ordered more capacity indicates that the CBB on Business Model is providing a windfall discount to the ISPs.

56. If an ISP determines that some of its end-users must change realms, it would provide the end-users which must change realms with new IDs associated with a realm which the ISP would have previously identified for business or residential use only. The ISP would then communicate with its end-users to ask them to change their IDs. Some ISPs even have the ability to remotely change such IDs on behalf of their customers. Within moments from login, end-users can resume transmitting traffic. The Companies disagree with CNOC that this process "would require months if not years to complete in an orderly fashion." While the Companies recognize this takes some coordination time, changing IDs is a rather simple step which is no more complicated than changing a password on a computer. Nonetheless, the Companies have a proposal to accommodate that transition set out in Section 8.0 below.

5.03 <u>The Limit on the Maximum Number of Realms ISPs Can Order Has Been Adjusted</u>

57. CNOC argues that "the costs imposed to acquire these additional reams [sic] will be significant and there are concerns that the artificial limit on the total number of realms that can be made available through the Companies' high-speed access services, under the implementation they have proposed, will also become a constraining factor."[38]

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58. As previously noted, separating by realm name is nothing new, the Companies' existing approved tariffs currently include provisions for the establishment of additional realms for ISPs.[39] The Companies' tariffs currently impose a limit of 15 domain (realm) names. In practice however, the Companies have allowed ISPs that acquired other ISPs to keep

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38 CNOC Application, paragraph 32.

39 General Tariff CRTC 6715, Item 5410.4.(b) and Item 5440.4.(a) GATEWAY ACCESS SERVICE.

the existing realms of both ISPs. As a result of this, the limit has been exceeded in a few occasions.

59. The limit was imposed at a time when the number of realms was rapidly increasing and the Companies were facing equipment limitations. However, since then, the Companies have upgraded their equipment so that the limit of realm names could be increased. Nonetheless, a limit is still required because the Companies' Broadband Access Server (BAS) continues to be limited in terms of routing requests it can handle, exceeding this limit could deteriorate service for all the end-users. A quick assessment reveals that a doubling of the number of current realms could be achieved without exceeding the limit of the equipment.

60. The Companies also noted CNOC's concerns regarding the costs for additional realms. To address this concern, the Companies would be prepared to waive the charges for ISPs that need additional realms in order to implement the CBB model (i.e., to segregate their traffic). The charges on a one-time order would be waived to allow ISPs to set up additional realms. The maximum number of additional realms would be equal to the current number of realms the ISPs' currently have provided that they are demonstrably required for the implementation of CBB (effectively allowing ISPs to double their realms for free).

5.04 The Implementation of Dynamic RADIUS or DPI to Segregate Business Traffic From Residential Traffic Would be Costly and Introduce More Problems Than it Would Solve

61. CNOC argues that the Companies should use other techniques such as deep packet inspection (DPI) or dynamic Radius to segregate business and residential traffic.[40] In other words, CNOC argues that the Companies should spend potentially millions of dollars and delay the introduction of a final CBB model for over a year instead of implementing realm splitting, something that is not necessarily as disruptive as CNOC claims and can be accomplished with the cooperation of the ISPs themselves.

5.04.1 The Companies' DPI Cannot be Used to Segregate Business and Residential Traffic

62. The Companies note that DPI was never used to separate different types of traffic. The Companies have always applied their technical ITMP using DPI on all the point-to-point protocol over Ethernet based high-speed services which transit via the BASs, on both

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[40] CNOC Application, paragraphs 35 and 36.

business and residential retail high-speed services as well as wholesale GAS traffic. CNOC may be confusing the fact that the Companies' High Speed Access (HSA) service was not subject to DPI (and consequently, to any technical ITMP) because it does not transit via the Companies' BASs, or that the Companies' initially proposed UBB was never intended to apply to business. Nevertheless, the Companies have already announced they have stopped deploying DPI equipment in their networks and are also withdrawing their technical ITMPs from their high-speed services effective 1 March 2012. Therefore, using the Companies' DPI to separate business traffic from residential traffic is not a viable option primarily because the equipment cannot not perform the separation required but also the high-speed traffic will no longer transit via this equipment.

5.04.2 The Separation of Business and Residential Traffic Through the Use of Dynamic Radius Would be Costly, Introduce Delays and Increase Gaming Opportunities

63. While the Companies agree that dynamic Radius has been used in the market, it is not the current architecture that the Companies have in place for their high-speed services. The Companies further note that dynamic Radius has never been implemented in the context of wholesale CBB and differentiated rates between business and residential traffic.

64. Implementing a dynamic Radius solution would represent replacing the Companies' high-speed service architecture and would impose significant costs on the Companies. Although the costs have not been fully assessed at this time, based on experience, the Companies estimate that introducing this new architecture as well as the additional correlation tools (described below) which would be required to manage the CBB model would cost millions of dollars (in the order of $ # for the architecture and $ # for the development of correlation

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tools). The development of the architecture and additional correlation tools represent significant upfront costs and are not usage driven. Therefore, to recover these costs, the Companies would have to update and increase their high-speed access rates. In addition, implementing dynamic Radius could take approximately one year to implement in the Companies' network.

65. Notwithstanding these considerations, there are three other issues associated with dynamic Radius: i) the round-robin architecture of the Companies would be completely replaced; ii) additional correlation tools would be required to audit for gaming; and iii) it

could impose changes in architecture on very small ISPs which may cause additional implementation delays.

66. Today, when the end-users of ISPs with multiple AHSSPIs log onto the Companies' network, they are assigned in an alternating fashion (also known as round-robin[41]). The first end-user is assigned on the first AHSSPI interface, the second end-user on the second interface and so on, up to the last AHSSPI of the ISP. ISPs are also allowed to provision multiple servers on each of their AHSSPIs so that end-users are assigned alternating sequentially between the ISPs' servers as well as per AHSSPI interface. The existing round-robin architecture essentially provides a basic and economical way for ISPs to achieve some level of load balancing and network redundancy even though these functions cannot be guaranteed on the Companies' networks.

67. With dynamic Radius, the Companies would no longer look in the BAS for the assignment, instead, the Companies would be sending requests from end-users to connect to a wholesale Radius server which would proxy the request to the ISP's Radius server which would in turn assign the end-user on a path that is available on one of the AHSSPIs. The ISPs would be telling the Companies which IP addresses are being used for business and which ones are used for residential traffic. The ISPs would be providing the Companies with the assignment path for each end-user via Radius to Radius communications.

68. The existing round-robin architecture would be replaced as it would not be feasible to run two types of architectures in parallel. The Companies are aware that some of the very small ISPs do not currently have a Radius Server. Introducing the dynamic Radius architecture would require some of these ISPs to invest and manage new equipment. The Companies note that this could cause even further implementation delays if all ISPs need to be converted prior to using dynamic Radius in the network.

69. Since ISPs would be providing the assignment of the end-users each time end-users log on, the Companies would have a much greater difficulty to ensure the CBB the ISPs will have ordered are respected. The simplest and most effective method the Companies have to audit is by having ISPs segregate their traffic by realms and periodically monitor the composition of traffic on those realms. This audit method involves correlating realms to telephone numbers.[42] This is the method that the Companies plan on using to audit

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[41] ISPs are familiar with the Companies' implementation of round-robin. Vaxination also provided a description to the Commissioners. See the hearing Transcripts, Volume 6 at paragraph 7335.

[42] Telephone numbers are qualified as business or residential in the Companies' systems.

the current CBB model. Under a dynamic Radius architecture (and if ISPs do not segregate business and residential traffic by realms), the Companies would have to build additional correlation tools (as a result of the greater chance of ISP gaming, as discussed below) to correlate sessions with telephone numbers and then identify on which of the ISP's end-point (a business or residential IP address) the communication was terminated. Developing such correlation tools would require additional financial and human resources which as mentioned above could take several million dollars to develop. Without these additional correlation tools, it would simply be impossible to audit.

70. As the Companies explained in previous filings, a penalty is required to incent ISPs to respect the rules and pay for capacity used for residential traffic on the Companies' network.[43] A penalty is required because ISPs have the technical ability and the financial incentives to avoid capacity costs. With simple auditing tools and a penalty the Companies would be able to ensure ISPs respect the rules. The Commission recently suspended its process to approve the Companies' proposed penalty charges in Telecom Order CRTC 2012-56 until the matters raised by CNOC in its Application are addressed. The Companies believe that such a penalty must be established, but all the more reason to do so with a Radius solution whereby it is that much easier for the ISP to game.

71. Even once auditing tools for a dynamic Radius architecture would be available, the Companies note that this architecture significantly increases the ability for ISPs to game with respect to segregating traffic by using different realms. The ISPs would be determining the assignment path and the Companies would have to rely on this assignment to be accurate. With realm splitting, an ISP can game the Companies by placing a residential end-user on a business realm. But, unless the ISP has an ability to remotely access the end-user's modem, that type of gaming cannot be easily changed for temporary purposes. In other words, while an ISP can game, as long as there is an adequate penalty, the Companies will be able to spot check ISP compliance. Unlike with the segregation by realms, with dynamic Radius, it is nearly transparent for end-users if their ISP changes the traffic path from a residential one to a path supposed to be reserved for business use. This can be done instantaneously allowing the ISP to temporarily (during peak periods) shift a residential end-user to a business realm to avoid having to purchase additional CBB capacity. The Companies would have no way

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[43] As Vaxination points out in its letter regarding the removal of the Companies' ITMP, "many ISPs who cater to heavy users have long ago implemented ways to avoid Bell Canada's throttling, those ISPs should not be seeing a huge change in bandwidth use." Although, the letter was related to a different topic, it illustrates that there are incentives to avoid costs and some ISPs are inclined to take advantage of the situation. See Vaxination letter, 21 December 2011, addressed to Bell Canada and sent to CNOC and Commission staff members.

of tracking this type of gaming in real time. It is for this reason that a correlation tool must be built in the case of a dynamic Radius solution when such a solution is not required in the case of realm splitting.

72. In light of the difficulties associated with implementing dynamic Radius for CBB and considering that realm splitting is not as disruptive as CNOC claims, the Companies submit that replacing the Companies' architecture with dynamic Radius is not warranted. #

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6.0 THE IMPLEMENTATION OF REAL-TIME MAPPING IS NOT TECHNICALLY FEASIBLE

73. At paragraphs 39 and 40 of its Application, CNOC states that ISPs require real-time access to the Companies' high-speed access service end-user login usernames and associated telephone numbers to enable the ISPs to audit whether end-customers are using their residential and business logins correctly.

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74. The Companies note that real-time mapping does not exist because the telephone number of end-users does not appear in any of the transactions involved to set up high-speed connections. The use of telephone numbers for auditing purposes can only be done in a non-real-time fashion such as on a monthly basis. Therefore, it is not technically feasible to implement the mapping that CNOC is requesting in the Companies' networks.

7.0 THE COMPANIES' COST STUDIES INCLUDED OVERHEAD

75. CNOC's final request for relief is with respect to its view that ISPs should not be charged 155 Mbps of capacity on OC-3 legacy interfaces when in fact those interfaces can only accommodate 130 Mbps of IP traffic. All data transmission networks, whether it be at OC-3 speed or voice grade 64 Kbps service, require that some portion of the transmission path be dedicated to 'overhead' functions (such as call routing) while the

remaining balance of the transmission path is available for payload or content. In the case of a 64 Kbps voice circuit, 8 Kbps are dedicated to overhead and the remaining 56 Kbps are available to transmit the voice signal. Similarly for higher speeds such as OC-3, approximately 130 Mbps is available for payload with the remaining 25 Mbps required for overhead. The same is also true for the Companies' IP AHSSPI 100 Mbps and 1000 Mbps carried using Ethernet protocol which also has some overhead. Clearly, overhead is required for data transmission to function and accordingly, the cost of both the overhead portion and the payload portion of a data transmission path must be included in the cost/rate of any data facility. In fact, CNOC's contention that it should only be charged for the payload portion of data transmission is like a customer at the post office saying it will pay for weight of the content of the box that they are mailing, but should not pay for the weight of the box itself. If shipping was based strictly on the weight of the contents as opposed to the total weight, then the price would be proportionately higher per unit of weight than what it is today.

76. Similarly, the Companies' CBB rates are based on the assumptions used in their costing model which are based on theoretical capacities as opposed to payload and therefore include overhead. If overhead was to be stripped out then the CBB rate per Mbps would have to increase with the corresponding reduction. In the Companies' view, CNOC's comments with respect overhead should be disregarded.

8.0 CONCLUSION - EXTENDING THE INTERIM REGIME

77. The Companies acknowledge that the implementation of realm splitting by ISPs, although not cost prohibitive, may take some time to implement. In light of the fact that the Companies' CBB solution is already in effect and implemented and given that there is a parallel model to accommodate those ISPs that have not yet segregated their traffic, the Companies propose that the Interim regime (including allowing ISPs to either choose the realm splitting model, or the CBB on Business Model) be extended for a maximum period of one year from the implementation deadline of 1 February 2012 (i.e., until 1 February 2013). This should provide those ISPs who would wish to segregate their traffic, but could not by the 1 February 2012 with sufficient time to implement realm splitting. To be clear, at the end of that period, all ISPs that have a mix of both residential and business end-users would be required to have instituted realm splitting if they wish to avoid paying CBB on their business traffic. After that date, the discount on business access rates for end-users that are carried over CBB charged realms would cease to apply. As for the final rate for the Interim period for CBB on Business end-users, the Companies submit that the Commission should replace the 10% discount with a revenue neutral rating methodology set out above in Section 3.3.

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