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Conseil de la radiodiffusion et des télécommunications canadiennes

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Review of costing inputs and the application process for wholesale high-speed access services

In Telecom Notice of Consultation 2015-225 (the Notice), the Commission initiated a proceeding to examine certain issues associated with wholesale high-speed access (HSA) services for large cable and telephone companies. Prior to the publication of the Notice, the Commission received a Part 1 application from the Canadian Network Operators Consortium Inc. (CNOC), in which CNOC raised concern that usage-sensitive rates associated with certain wholesale HSA services were no longer just and reasonable. CNOC requested that the Commission make these rates interim for all current wholesale HSA service speeds that are currently approved on a final basis, including the monthly capacity rate per 100 megabits per second (Mbps) service. The Commission merged the proceedings of CNOC's Part 1 application and the Notice.

The Commission has made its determinations in this decision with the objectives to (i) establish a streamlined tariff application process, and (ii) ensure that the inputs to wholesale HSA service providers' cost models remain appropriate for the purpose of establishing just and reasonable rates.

Simplified cost-based approach

To meet the first objective, the Commission has adopted a speed-banding approach, which is a simplified cost-based approach for rate-setting, through which wholesale HSA service providers will have the flexibility to introduce new service speeds within a set speed-band without filing an associated cost study.

Components of cost studies

To meet the second objective, the Commission has made determinations with respect to certain components of cost studies. The first component is the annual traffic growth assumption. The Commission has determined that the annual growth of Internet traffic has increased significantly since its determinations in Telecom Regulatory Policies 2011-703 and 2011-704. All cost studies submitted in support of new wholesale HSA services are now to include in the first two years of the study period traffic growth rates per retail end-user consistent with historical levels, followed by a constant growth rate of 32%, instead of the previous 20% level, for each of the remaining years of the study period.

Canada

The second component is the annual capital unit cost change assumption related to equipment cost trends. Due to technological advancements, suppliers are able to meet rising demands from traffic growth by increasing equipment capacity at a lower cost per unit. With respect to wholesale HSA services, the continued use of a service-specific capital unit cost factor that recognizes the annual capital unit cost change assumption remains appropriate. However, the Commission has adjusted the annual capital unit cost change assumption from minus 10% to minus 26.4% for traffic-driven equipment.

The third component is the appropriate study period for a cost study. The Commission has determined that a five-year study period is appropriate for wholesale HSA services. For services with significant start-up costs, an adjustment is to be made to the monthly costs per end-user to allow for the recovery of start-up costs over a reasonable period instead of over the five-year study period.

The fourth component relates to usage-sensitive equipment costs. The Commission has determined that wholesale HSA service providers must ensure that all equipment in the access portion of the service includes only non-usage-sensitive costs.

Interim rates

The Commission has also determined that with respect to destandardized services with rates that have been approved only on an interim basis, the rate of the applicable speed-band will be used as the final rate for these destandardized services.

In consideration of the above determinations, the Commission has made interim all wholesale HSA service rates that are currently approved on a final basis, including the monthly capacity rate per 100 Mbps service, as of the date of this decision.

*The Commission hereby **directs** all wholesale HSA service providers to file cost studies reflecting the determinations set out in this decision within **45 days** of the date of this decision. The Commission will assess the extent to which, if at all, retroactivity will apply when new cost studies are submitted in support of revised wholesale HSA service rates.*

By streamlining the tariff application process and adjusting costing inputs, the Commission aims to accelerate the finalization of rates and to ensure that these rates are just and reasonable, facilitating sustainable competition for services such as Internet access to the benefit of Canadians.

Introduction

1. The Commission regulates the wholesale high-speed access (HSA) services provided by the large cable and telephone companies (collectively, the wholesale HSA service providers).[1] Competitors[2] can use these services to provide their own retail Internet services and other services. The wholesale HSA services provided by large cable companies are known as third-party Internet access (TPIA) services, while the

[1] A list of the wholesale HSA service providers is provided in paragraph 9.

wholesale HSA services offered by large telephone companies are known as digital subscriber line (DSL)[3] services.

2. In Telecom Regulatory Policies 2011-703 and 2011-704 (collectively, the 2011 Regulatory Policies), the Commission determined how wholesale HSA service providers should charge Competitors for wholesale HSA services. The Commission approved the use of two billing models: (i) the capacity-based billing (CBB) model,[4] and (ii) the flat rate model.[5] The Commission also determined certain costing assumptions common to wholesale HSA service providers that are reflected in the rates that were approved at that time.

3. Competitors have expressed concerns to the Commission that certain cost parameters and Internet traffic growth assumptions established in the 2011 Regulatory Policies may no longer be appropriate.

4. In recent years, the wholesale HSA service providers have introduced a significant number of Internet service speeds for their respective retail customers. Pursuant to the Commission's speed-matching requirement,[6] the wholesale HSA service providers are required to file, and have filed, corresponding wholesale HSA service tariff applications for Commission approval.

5. Due to the frequent changes in retail Internet service speeds, the wholesale HSA service providers have had to file an increasing number of tariff applications, constituting a regulatory burden for the wholesale HSA service providers and Competitors. For the wholesale HSA service providers, the main regulatory burden stems from the fact that each tariff application needs to be supported by a cost study. Until the Commission has approved a rate for a wholesale HSA service speed, Competitors cannot make use of this service speed. In an effort to expedite the availability of new wholesale HSA service speeds, the Commission's practice has been to approve applications on an interim basis, based on the rate of the nearest

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[2] For the purpose of this decision, "Competitors" are the customers of wholesale HSA services. Competitors purchase access to wholesale HSA services to provide (or resell) telecommunications services to their own end-users.

[3] For the purpose of this decision, references to DSL include all technologies that can be supported on fibre-to-the-node (FTTN) and non-FTTN facilities.

[4] Rates determined using the CBB model have two components: (i) a monthly rate per speed tier for access to the network, and (ii) a separate rate for capacity in increments of 100 megabits per second (Mbps). The CBB model requires that a Competitor determine in advance the amount of capacity it will need to provision Internet and other services to its end-users.

[5] Rates determined using the flat rate model have one component: a single monthly rate per end-user by speed with no additional usage charge. The flat rate model enables Competitors to buy wholesale HSA services for a fixed rate.

[6] The retail speed-matching requirement for wholesale HSA services is set out in Telecom Decision 2006-77 and maintained in Telecom Regulatory Policy 2010-632. Under the speed-matching requirement, when a wholesale HSA service provider introduces a new retail Internet service speed, it must also offer that speed to Competitors by filing, at the same time, a tariff application for a wholesale HSA service that matches the new speed offering, with a supporting cost study.

lower-approved service speed,[7] pending a review of the supporting cost study. There are currently a number of applications with interim approval that require supporting cost studies to establish final rates.

6. On 28 May 2015, the Commission issued Telecom Notice of Consultation 2015-225 (the Notice), in which it invited comments on six issues associated with the regulation of wholesale HSA services. The Commission's objectives in initiating the proceeding established by the Notice were to seek comments on streamlining the tariff application and cost study review processes for wholesale HSA services, as well to assess the continued appropriateness of certain costing assumptions set out in the 2011 Regulatory Policies.

7. The Commission also received a Part 1 application from the Canadian Network Operators Consortium Inc. (CNOC), dated 30 April 2015 (the CNOC application), in which CNOC raised concern that usage-sensitive rates associated with certain wholesale HSA services were no longer just and reasonable. CNOC requested that the Commission make interim various wholesale HSA service rates that received final approval, pending a review by the Commission of the appropriateness of the existing approved rates.

8. By way of procedural letter dated 17 September 2015, the Commission stated that the record generated by the proceeding initiated by the Notice would assist it in determining whether existing wholesale HSA service rates should be made interim as CNOC requested. Accordingly, the Commission incorporated the record associated with the CNOC application with the record of the proceeding initiated by the Notice.

9. The Commission received interventions from Bell Canada, MTS Inc. (MTS), on behalf of itself and Allstream Inc. (collectively, MTS Allstream), Saskatchewan Telecommunications (SaskTel), and TELUS Communications Company (TCC) [referred to collectively as the large telephone companies]; Cogeco Cable Inc. (Cogeco), Rogers Communications Partnership (RCP), and Quebecor Media Inc., on behalf of Videotron G.P. (Videotron) [referred to collectively as the Cable Carriers], Bragg Communications Incorporated, operating as Eastlink (Eastlink), and Shaw Cablesystems G.P. (Shaw) [all of which are referred to collectively as the large cable companies]; as well as CNOC; the Government of Yukon; Vaxination Informatique (Vaxination); and VMedia Inc. (VMedia).

10. The public record of this proceeding, which closed on 3 August 2015, is available on the Commission's website at www.crtc.gc.ca or by using the file numbers provided above.

[7] In Telecom Decision 2013-36, the Commission determined that in cases where a cost study has not been provided, rates for wholesale HSA services at an existing lower-approved service speed would provide appropriate interim rates for proposed new service speeds.

Issues

11. The Commission has identified the following issues to be addressed in this decision:

a) Issues raised in the Notice

- Should the cost and rate structure of wholesale HSA services (whether based on the flat-rate billing or CBB model) be simplified?
- Should the Commission's 20% annual traffic growth assumption be modified to more accurately reflect current usage growth trends?
- Should the annual unit cost change assumption of minus 10% be modified to more accurately reflect current equipment cost trends?
- Should the study period be changed from the current ten years to a shorter period? If so, would a five-year study period be appropriate?
- Should the usage-sensitive equipment (e.g. Cable Modem Termination System [CMTS], Optical Node) be assigned to the traffic-driven portion of cost models? If so, to what extent (e.g. 100%)?
- How should the Commission determine final rates for destandardized services?

b) Issue raised in the CNOC application

- Should the Commission set rates interim for wholesale HSA services on the grounds that they may no longer be just and reasonable?

Should the cost and rate structure of wholesale HSA services (whether based on the flat-rate billing or CBB model) be simplified?

12. In the Notice, the Commission invited comments on the adoption of a rate-setting approach that would serve to reduce the regulatory burden associated with, and expedite the final disposition of, wholesale HSA service tariff applications. Specifically, the Commission examined the proposals set out below. The Commission also provided interested persons with the opportunity to propose different rate-setting approaches.

- The fixed access approach: This approach involves the creation of a fixed access rate that would apply to all service speeds. The fixed rate would recover both speed-dependent and speed-independent access costs for all service speeds and would be calculated as a weighted-average access rate expressed on a dollar-per-access basis.
- The speed-banding approach: This approach would result in the adoption of two access rate components. The first rate component would consist of a speed-independent, fixed, weighted-average access rate that would apply to all service speed offerings. The second rate component would consist of a speed-dependent access rate per speed-band uniformly applied to all service speeds falling within a given speed-band. Each speed-band would be determined based on service speeds that have similar costs.

- The status quo approach: Maintain the current cost and rate structure whereby the rate of each service speed is based on an associated cost study.

Positions of parties

13. Bell Canada, Eastlink, and TCC supported the speed-banding approach.

14. CNOC submitted that the speed-banding approach is appropriate for all wholesale HSA service providers, except those that recover all of their speed-dependent costs in the monthly capacity rate per 100 megabits per second (Mbps) service. CNOC further submitted that the fixed access approach would be appropriate for access service rates that do not include a usage-sensitive component, and would be more appropriate for wholesale HSA service providers that use the CBB model.

15. SaskTel submitted that the company's current tariff structure effectively represents the fixed access approach and that it therefore supports that approach. Further, SaskTel considered that the speed-banding approach would not lead to a streamlined tariff application process; therefore, it did not support that approach.

16. MTS submitted that it currently provides two wholesale HSA services through which competitors can offer any retail Internet service speed to their end-users, up to the maximum speed that MTS offers for each of those services. This enables MTS to make retail service speed changes without needing to create matching wholesale service speed products. MTS thus preferred the status quo approach, since this approach enables it to comply with the speed-matching requirement, reducing the need for MTS to conduct a cost study for each new retail service speed introduced, and thereby reducing the company's regulatory burden.

17. Shaw proposed an alternative approach in which currently approved cost-based wholesale HSA service rates could be used to generate new rates through interpolation. Through this approach, the rate for a proposed new service speed would be determined based on two data points: (i) the approved rate for the current, nearest-lower wholesale HSA service offering; and (ii) the approved rate for the current, nearest-higher wholesale HSA service offering. For proposed new service speeds that are outside the range of currently approved speed levels (i.e. one reference data point does not currently exist), the wholesale HSA service providers would file a cost study to support the proposed rate.

18. The Cable Carriers opposed the fixed access approach, and submitted that the speed-banding approach would be appropriate if the Commission chooses to move away from the status quo. However, they suggested a refinement to the speed-banding approach whereby rates would be established for certain service speeds (i.e. reference speeds), and interpolation would be used to establish rates for service speeds between the adopted reference speeds.

Commission's analysis and determinations

19. Under the status quo approach, when a tariff application is filed to introduce a wholesale HSA service speed, a cost study is required to set the associated rate on a final basis. In light of the speed-matching requirement, when wholesale HSA service

providers make retail Internet service speed changes, they must file associated wholesale tariff applications. The status quo approach is therefore burdensome for all stakeholders involved, and results in significant rate uncertainty, since rates remain interim for extended periods of time, which is detrimental to both the wholesale HSA service providers and their customers (i.e. the Competitors).

20. The fixed access approach is not appropriate for wholesale HSA service providers that have adopted the flat rate model, since their rates incorporate both speed-dependent and speed-independent cost components. Given that a single rate would apply to all service speeds, this may result in lower-speed services with lower usage inappropriately subsidizing higher-speed services with higher usage. However, if the fixed access approach were adopted by wholesale HSA service providers that use the CBB model, such inappropriate subsidization should not occur as long as the access cost differences between the lowest and highest service speed offerings are similar.

21. In contrast, the speed-banding approach can be adopted for both types of billing models, although the implementation of this approach may require additional effort to develop rates for wholesale HSA service providers that use the flat rate model than for those that use the CBB model. This is because the access and usage costs are blended, for rate-setting purposes, in the flat rate model, whereas they are separate in the CBB model.

22. The implementation of the speed-banding approach for wholesale HSA service providers, particularly those that use the flat rate model, could also result in the inappropriate subsidization of higher-speed services by lower-speed services. However, this concern can largely be mitigated by ensuring that the service providers select their speed-bands by grouping together, for rate-setting purposes, services with similar costs. This implementation issue is of lesser concern to the wholesale HSA service providers that use the CBB model, since under this model, access rates and capacity rates are separate tariff items. This separation simplifies the implementation of the speed-banding approach, since there would be less access service cost variability across speed-bands.

23. Through interpolation, a linear projection is used to determine a proposed new service speed rate that lies between two approved service speed rates. It is assumed that peak period traffic has a linear relationship with service speeds. However, cost study evidence filed in support of proposed new wholesale HSA service speeds indicates that the relationship between peak period traffic and the associated service speeds is not linear. Further, interpolation has the effect of treating all costs as if they vary by speed, including speed-independent costs, which are fixed and should not change by speed. Accordingly, the Commission rejects the use of interpolation as a means of setting rates.

24. As noted above, the Commission's objectives in the proceeding initiated by the Notice include reducing the regulatory burden associated with the introduction of wholesale HSA services and expediting the final disposition of related tariff applications. Based on the interventions received and the Commission's overall objective to assess tariff applications in a timely manner, the adoption of an alternative to the status quo approach is appropriate.

25. Under the speed-banding approach, cost studies would be required only when a wholesale HSA service provider introduces a new service speed outside the approved speed-bands or when costs have materially changed, such as in cases where these providers introduce new equipment or make changes to their service configurations. The expedited disposition of tariff applications would reduce rate uncertainty, to the benefit of all stakeholders. While many of these benefits would also result from the adoption of the fixed access approach, there are drawbacks associated with this approach for wholesale HSA service providers that use the flat rate model. However, these drawbacks are mitigated under the speed-banding approach.

26. In light of the above, the Commission determines that rate-setting for all wholesale HSA services is to be done in accordance with the speed-banding approach. This approach will simplify the rate-setting process, since wholesale HSA service providers that propose new service speeds within an approved speed-band will be required to file a simplified tariff notice application without a supporting cost study, resulting in a streamlined approval process by the Commission.

Should the Commission's 20% annual traffic growth assumption be modified to more accurately reflect current usage growth trends?

27. In the 2011 Regulatory Policies, the Commission determined that all wholesale HSA service providers in the HSA services market would be subject to similar conditions and traffic growth rates in the long term. Accordingly, consistent with Telecom Decision 2006-77, for the wholesale HSA service providers other than MTS Allstream,[8] the Commission applied to the first two years of the cost study period traffic growth rates per retail end-user consistent with historical levels, followed by a constant growth rate of 20% for each of the remaining years of the study period.

28. In recent proceedings, several parties have submitted that annual Internet traffic growth per end-user has increased significantly beyond 20%. Increasing traffic growth will result in an increase in the costs to provision Internet service to end-users.

Positions of parties

29. Wholesale HSA service providers and Competitors agreed that annual Internet traffic has been growing at a rate greater than the Commission's current 20% annual traffic growth assumption. However, the Internet traffic growth rate estimates provided on the record of this proceeding varied considerably, with the highest estimate being more than double the lowest estimate.

[8] In contrast to all other wholesale HSA service providers' wholesale service billing models, MTS Allstream's capacity model did not explicitly take into consideration forecasts of traffic growth rates per retail end-user.

30. Shaw submitted that its forecasted growth rates were not only supported by its recent experience and expectations, but also by industry forecasts. Shaw made reference to the Cisco Systems, Inc. (Cisco) Visual Networking Index White Paper[9] (the Cisco VNI White Paper), in which Cisco provided a growth forecast for Internet traffic in Canada. The Cisco VNI White Paper indicates that peak period Internet traffic will grow, from 2014 to 2019, at a compound annual growth rate (CAGR) of 32%.

31. CNOC also referred to the Cisco VNI White Paper in support of its proposed growth estimate. CNOC submitted that peak period Internet traffic growth at a CAGR of 32% is a relevant measure, since it provides an estimate of Internet traffic growth, which the wholesale HSA service providers should use as a basis upon which to estimate their costs.

32. The Government of Yukon, TCC, and Vaxination supported a company-specific Internet traffic growth rate that could take into consideration regional differences.

Commission's analysis and determinations

33. Based on the evidence submitted, the 20% annual traffic growth assumption established in the 2011 Regulatory Policies is no longer appropriate.

34. However, not only did the traffic growth rate forecasts vary significantly between parties, but the methodologies used to derive these forecasts varied as well.

35. Insufficient evidence was provided by parties advocating for the adoption of company-specific traffic growth rates, with respect to both the appropriateness of using such growth rates and, if used, what those growth rates should be. The Commission remains of the view, as expressed in the 2011 Regulatory Policies, that end-user Internet behaviour is similar throughout Canada, rather than being region-specific. Accordingly, the Commission **denies** the use of company-specific traffic growth rates.

36. The Commission has reviewed the Cisco VNI White Paper, which provides an ongoing forecast and analysis of the growth and use of Internet Protocol networks worldwide. The paper contains Canada-specific data, including an estimate of the annual busy-hour Internet traffic growth rate for Canada of 32% for the period of 2014 to 2019.

37. The validity of the Cisco VNI White Paper was not refuted by any of the interveners. Further, Bell Canada, CNOC, RCP, SaskTel, and VMedia all submitted estimated growth percentages in the same vicinity as that in the Cisco VNI White Paper.

38. The Cisco VNI White Paper uses sound methodology, and provides a proper and principled basis for determining a Canada-wide Internet traffic growth forecast. Accordingly, it would be reasonable to set the annual busy-hour Internet traffic growth rate for Canada at 32% annually.

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[9] Cisco Visual Networking Index: Forecast and Methodology, 2014-2019 White Paper

39. It is also appropriate for the Commission to continue its approach set out in Telecom Decision 2006-77 and in the 2011 Regulatory Policies, in which it applied to the first two years of the study period traffic growth rates per retail end-user consistent with historical levels, followed by a constant annual growth rate assumption for the remaining period of the cost study.

40. Accordingly, the Commission determines that in their cost studies submitted in support of proposed new wholesale HSA service rates, all wholesale HSA service providers are to include, in the first two years of the study period, annual traffic growth rates per retail end-user consistent with historical levels, followed by a constant growth rate of 32% for each of the remaining years of the study period.

Should the annual unit cost change assumption of minus 10% be modified to more accurately reflect current equipment cost trends?

41. In the 2011 Regulatory Policies, the Commission determined that due to the rapid growth in Internet traffic and Internet applications, equipment suppliers would increase equipment capacity to meet increasing traffic demand, leading to significant reductions in capital unit costs over time. Accordingly, the Commission determined that, for the large cable and telephone companies, an annual capital unit cost (i.e. the annual unit cost per Mbps) change assumption of minus 10%, applied to all traffic-driven equipment, provided a reasonable estimate of the impact of expected equipment capacity increases and the resultant unit cost reductions over the study period.

42. Concerns have been raised that the annual capital unit cost change assumption set out in the 2011 Regulatory Policies may no longer be appropriate.

Positions of parties

43. SaskTel submitted that the current annual capital unit cost change assumption of minus 10% for usage-driven equipment is incorrect. SaskTel's own forecasts predict a long-term capital increase factor (CIF)[10] of 0%. The company submitted that while historical evidence shows negative cost trends, the decline has not continued in 2014, and the company now anticipates a price correction in the opposite direction. SaskTel indicated that for instance, the U.S.-dollar price of replacing transmission equipment purchased in 2010 with comparable equipment purchased in 2015, ignoring the impacts of currency changes, declined by only 6.5% over the five-year period. Moreover, a similar comparison for equipment used as edge routers shows price increases of 50%.

44. Shaw and TCC supported the retention of the minus 10% assumption based on internal company data. To support its position, Shaw pointed to recent cost studies it has submitted in support of its proposed rates for its recent wholesale HSA service speeds.

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[10]Asset-specific CIFs are parameters that are applied to capital costs to forecast year-over-year price level changes for capital equipment. Asset-specific CIFs are developed from corporate data and other inputs regarding equipment within an asset class.

45. Shaw and TCC further requested that the Commission not apply the annual unit cost change assumption to labour, since labour costs continue to increase, and installation for next-generation transport is very labour-intensive.

46. Bell Canada and MTS sought the use of an asset-specific CIF instead of a service-specific capital unit cost factor.[11] Bell Canada indicated that if a service-specific capital unit cost factor were retained, the company would support the continued use of minus 10%. The Cable Carriers supported the adoption of a similar approach.

47. VMedia submitted that equipment prices are changing faster than minus 10%. Vaxination submitted that annual cost changes related to traffic aggregation networking equipment are close to minus 30%.

48. CNOC referenced two reports, the Scott Report[12] and the LeaseWeb[13] Report,[14] as well as CNOC members' own data, to demonstrate that unit costs have been declining much more rapidly than the current assumption of minus 10%. CNOC submitted that the Scott Report states that the unit price per Mbps of high-capacity routers has changed by a CAGR of minus 26.4% for the period from 2006 to 2013, and that the unit price per Mbps of long-haul dense wavelength division multiplexing (DWDM)[15] equipment has changed by a CAGR of minus 18.4% for the same period. CNOC indicated that the LeaseWeb Report contains similar results. CNOC submitted that its own members have seen price reductions in router equipment that approximate the values in the Scott Report.

49. Bell Canada, the Cable Carriers, and Shaw took issue with CNOC's reliance on the Scott Report.

50. Bell Canada noted that the Scott Report infers cost trends on the basis of price trends. In Bell Canada's view, such an inference should not be made for a number of reasons. First, because the price changes retained for the purpose of the report occurred during the dot-com bubble burst, they should not be relied upon to develop future projections. Second, the ability of a carrier to take advantage of any price decrease is constrained by both the choice of vendor and the carrier's equipment needs. Third, recent exchange rate fluctuations have resulted in price increases for equipment purchased in U.S. dollars. Lastly, by being based entirely on equipment prices, the Scott Report does not account for the labour costs incurred by the carrier, which are increasing.

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[11] A service-specific capital unit cost factor is used for specific types of equipment within an asset class.

[12] J. Scott Marcus, The Economic Impact of Internet Traffic Growth on Network Operators, October 24, 2014 (referred to in this proceeding as the Scott Report)

[13] LeaseWeb is a global network provider.

[14] Bart van der Sloot, LeaseWeb Network, *Network economics: more bandwidth for your buck* (June 3, 2015)

[15] DWDM is a technology that puts data from different sources together on an optical fibre with each signal carried at the same time on its own separate light wavelength.

51. The Cable Carriers and Shaw submitted that the Scott Report should be disregarded due to the use of dated data, a focus on high-end router and long-haul DWDM equipment at the aggregated worldwide level, and the exclusion of cost trends of the CMTS and other key pieces of equipment that may have different productivity trends.

Commission's analysis and determinations

52. With respect to the proposal to use an asset-specific CIF instead of a service-specific capital unit cost factor, asset-specific CIFs are based, in part, on the functions of an asset beyond those that may pertain to the wholesale HSA service. To determine wholesale HSA service rates, the cost reduction factor should be specific to the equipment used to provide the wholesale HSA service. As a result, and consistent with the approach adopted in the 2011 Regulatory Policies, the continued use of a service-specific capital unit cost factor remains appropriate for all wholesale HSA service providers.

53. There was no consensus among parties regarding the appropriate value of an annual capital unit cost change assumption. Additionally, few interveners provided evidence to support their recommendations. Some interveners that did provide evidence based their evidence on cost changes relating to total network transport and not service-specific transport. Evidence relating to total network transport is misleading, since it includes the unit cost changes associated with all network hardware and software, comprising both legacy and non-legacy technology. As such, it does not accurately reflect the savings associated with growth technology, which is inconsistent with the requirement for cost studies.

54. With respect to Shaw's cost study evidence for the retention of the minus 10% capital unit cost change assumption, the Commission has not yet fully scrutinized Shaw's recent cost studies to support the rates for its recently proposed wholesale HSA service speeds, some of which are significantly higher than existing nearest-approved service speed rates. Also, in Telecom Order 2015-73, which pertains to service speeds for which the proposed rates were supported by one of the above-mentioned cost studies, the Commission determined that Shaw's application contained an insufficient level of detail to satisfy it that the proposed rates were just and reasonable.[16] Accordingly, until the Commission conducts further scrutiny of Shaw's cost studies, the weight to be given to those cost studies is limited.

55. Regarding SaskTel's arguments, the company did not provide evidence to support its position that edge router equipment replacement costs have increased by 50%. Further, while the cost of the new equipment referenced by SaskTel may not have changed significantly relative to that of the old equipment, the capacity associated with this equipment has increased significantly, thus decreasing the equipment's unit cost.

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[16] In that order, the Commission set the rates on an interim basis using Shaw's existing nearest lower-speed service rates.

56. Regarding the arguments put forth by Bell Canada on the Scott Report,

- this report was published by the Social Science Research Network using data from the Dell'Oro Group.[17] The data in the Scott Report is based on historical trends and forecasts reflecting global pricing for comparable equipment used in the telecommunications industry.

- significant competitive pressures in the market for major telecommunications equipment lead to cost advantages for service providers. As such, trends in the costs associated with major router equipment for wholesale HSA service providers can reflect global retail price trends.

- with respect to the concern that the dot-com bubble burst impacted equipment prices, any price decline arising from the dot-com bubble burst occurred prior to the data period (2006 to 2013) upon which the Scott Report is based, and the concern is therefore moot.

- with respect to vendor selection and price packaging being time sensitive and not reflective of the prices obtained by various companies, this view may be correct for short and specific time intervals. However, the annual unit cost per Mbps change of minus 26.4% identified in the Scott Report is reflective of a longer-term cost trend.

- with respect to currency fluctuations for equipment purchased through U.S.-dollar contracts, the Scott Report's unit cost analysis for router equipment is expressed in U.S. dollars; therefore, the exchange rate is irrelevant when considering the percentage change in unit cost trends.

57. With respect to Shaw's request that the Commission reject the cost change of minus 26.4% from the Scott Report since it includes only high-end routers and excludes cost trends of the CMTS, all major equipment used in the telecommunications industry is growing in capacity and functionality. Further, the next generation of the CMTS is a converged edge router.[18] Accordingly, Shaw's growth technology will have a similar cost trend as that experienced by high-end routers.

58. In light the above, the Commission determines that the Scott Report constitutes a reliable source of data from which to determine a revised annual unit cost per Mbps change assumption.

59. The Commission has considered the comments made by Shaw and TCC that labour and installation costs for next-generation transport have increased significantly and that the cost reduction factor (i.e. the annual capital unit cost change) should not

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[17] The Dell'Oro Group publishes market information about the telecommunications industry. The source report used for the Scott Report is as follows: Dell'Oro Group, Optical Transport Report: Five Year Forecast: 2011 – 2015, Vol. 11, No. 2 O2A, Technology Segments: WDM, Multiservice Multiplexer, Optical Switch, Optical Packet, published July 2011.

[18] Arris, a supplier of cable networking equipment, describes the new E6000 Converged Edge Router as providing the capabilities of the CMTS, while providing new levels of density, as well as lower costs for installation and maintenance.

apply to labour costs. The Commission agrees with Bell Canada that the Scott Report does not address labour costs, but this does not support the proposal that the cost reduction factor should not be applied to the costs associated with equipment installation.

60. The approved incumbent local exchange carriers' (ILECs) Regulatory Economic Studies Manuals provide for (i) the application of a labour cost increase factor to account for matters such as increases in salary, and (ii) the accounting of costs resulting from changes in labour time estimates.

61. However, the capacity cost approach is generally used to estimate labour costs using annual cost (labour) per capacity (e.g. Mbps), multiplied by the annual capacity forecast, as explained in section 3.4.3.2 of the ILECs' Regulatory Economic Studies Manuals. Through the Commission's determination above, the annual capital unit cost change of minus 26.4% applies to an annual unit cost per Mbps. Accordingly, whenever labour costs are estimated using the capacity cost approach, it is appropriate to apply the annual capital unit cost change of minus 26.4%. Provided that the wholesale HSA service providers properly account for and substantiate their installation time estimates and their labour increase factor, all costs associated with labour will be accounted for.

62. Regarding the cost change associated with DWDM equipment of minus 18% identified in the Scott Report, with the use of a fibre cost factor (FCF),[19] any price changes for DWDM equipment will be taken into account.

63. In light of the above, the Commission reaffirms that with respect to wholesale HSA services, the continued use of a service-specific capital unit cost factor is more appropriate than an asset-specific CIF. Further, the Commission determines that the annual capital unit cost per Mbps change assumption of minus 10% should be changed to minus 26.4% for traffic-driven equipment.

Should the study period be changed from the current ten years to a shorter period? If so, would a five-year study period be appropriate?

64. The Regulatory Economic Studies Manuals of the large telephone companies indicate that a study period should capture the impact associated with the major cash flows of the service in question, including any associated start-up costs. In the 2011 Regulatory Policies, the Commission considered that the use of a shorter study period would not permit the significant start-up costs associated with wholesale HSA services to be spread over an appropriate period. The Commission also considered that a study period of ten years would reflect potential reductions in capital unit costs that may occur over time due to technological advancements and increases in network usage.

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[19] The FCF approach is used by large telephone companies to estimate the transport fibre costs associated with a service. This approach relies on the ratio between fibre cable investments and related fibre electronic investments. For example, an FCF of 0.25 means that for every $100 invested in fibre electronic equipment, $25 will be invested in fibre cable.

Positions of parties

65. With the exception of CNOC, all interveners agreed that a study period shorter than ten years would better reflect the dynamics associated with wholesale HSA services and would reduce the regulatory burden for both the industry and the Commission. SaskTel submitted that a study period longer than five years would be warranted only when there are significant one-time costs that are causal to the service.

66. Bell Canada submitted that the arguments it raised in the proceeding leading to the 2011 Regulatory Policies, the subsequent proceeding to review and vary the 2011 Regulatory Policies, and the proceeding leading to Telecom Regulatory Policy 2015-326 (the wholesale wireline service proceeding) continue to apply. Specifically, Bell Canada reiterated its position that

    - a ten-year study period does not yield realistic results in light of the rapid evolution of Internet technology and advancements in replacement technologies;
    - it is possible that proposed service speeds will not exist for the full duration of a ten-year study period;
    - a five-year study period is typical in cost studies for Competitors' services, even those with significant upfront start-up costs; and
    - end-users' habits change rapidly, affecting the Internet usage assumed in cost studies; therefore, predicting usage demand over a ten-year period may lead to erroneous forecasts. This view was also submitted by the Cable Carriers, MTS, SaskTel, Shaw, TCC, and Vaxination.

67. CNOC submitted that a ten-year study period should continue to apply, since the service life of fibre transmission equipment, data switching equipment, and routers is between seven and ten years. In CNOC's view, a five-year study period would not appropriately track the economic service life of the cost drivers and major cash flows associated with the service in question.

68. Vaxination proposed a five-year study period, but suggested that there be no averaging of the rates over this period. Vaxination therefore proposed that service rates be published in tariffs each year to reflect the cost and productivity of the service for that year.

69. Bell Canada, supported by the Cable Carriers and TCC, requested that the Commission apply a five-year study period on a "going-forward basis" – that is, after the original ten-year study period associated with existing services has been completed. They opposed switching to a five-year study period immediately, which would require them to update their existing cost studies to reflect the change.

70. CNOC submitted that the opposition by Bell Canada, the Cable Carriers, and TCC to cost study updates is flawed. First, since the annual expense and capital cost data that populate the outward years of a ten-year cost study are highly discounted in cost studies, it is expected that wholesale HSA service providers would have recovered most, if not all, of the costs associated with their existing services over the first four

years of the service's life. CNOC further submitted that the Commission already determined in Telecom Regulatory Policy 2009-274 that wholesale HSA service providers are permitted to recover any unrecovered costs associated with a service offering through the inclusion of the unrecovered costs in cost study updates provided before the end of the study period.

71. CNOC proposed that the Commission conduct periodic reviews of wholesale HSA service rates, supported by a ten-year cost study, at least once every three years. CNOC stated that these periodic reviews would enable the Commission to update costing information, including demand forecasts, to maintain just and reasonable rates.

72. Bell Canada, the Cable Carriers, and TCC argued that longer study periods are to CNOC's advantage. They argued that a carrier's capital costs are all incurred up front, but wholesale HSA service customers can benefit from discounted rates during the first half of the study period, since the approved rates are based on the net present value of ten years of productivity gains. These parties indicated that this situation provides CNOC members with an incentive to request that the Commission call for the filing of new cost studies prior to the end of the original cost study period, resulting in the wholesale HSA service provider being denied a fair return on its capital investment.

Commission's analysis and determinations

73. The Commission agrees that wholesale HSA service speeds are rapidly changing and that many service speed offerings may not have a life span of more than five years. Consequently, a ten-year study period is no longer appropriate.

74. Use of a five-year study period for these services would (i) recognize the rapid evolution of Internet technology, (ii) more accurately reflect cost and service demand forecasts, and (iii) allow for the more timely update of actual costs and traffic usage. Accordingly, the Commission determines that subject to what follows below, wholesale HSA service rates are to be established based on five-year cost studies.

75. In cases where there are significant costs[20] causal to a service, such as significant start-up costs and billing system development costs, it is appropriate for the service provider to recover these costs over the life of the service or over a reasonable period (e.g. 10 years or 15 years, as appropriate) that is longer than the study period. Accordingly, when there are significant costs causal to a service, an adjustment is necessary to ensure that these costs are recovered over the life of the service or the reasonable period. See the Appendix to this decision for an example illustrating how the adjustment could be made to the monthly cost.

76. These changes to the study period are to take place immediately, and not after the expiration of the current ten-year study period. When service rates are revisited prior to the end of an original study period, service providers may be unable to recover certain costs that they would have otherwise expected to recover. It is appropriate for

[20] Costs are significant when the sum of all costs causal to a service is equal to or greater than 20% of the total service cost (i.e. the present worth of annual costs [PWAC]).

service providers to be able to recover these costs. Unrecovered costs that are causal to a service can be recovered according to the methodology outlined in Appendix E-1 of the large telephone companies' Regulatory Economic Studies Manuals, which were approved in Telecom Order 2008-237. For all other unrecovered costs, the Commission requests wholesale HSA service providers to identify and justify the amount, with supporting rationale, and to propose a way to recover these costs.

Should the usage-sensitive equipment (e.g. CMTS, Optical Node) be assigned to the traffic-driven portion of cost models? If so, to what extent (e.g. 100%)?

77. The cost model for wholesale HSA services is composed of two broad categories of costs: access costs and usage costs. Access costs comprise all costs associated with end-users' access to the network. Usage costs comprise the costs incurred to move data throughout a wholesale HSA service provider's network. The costs associated with the equipment used to move data throughout a wholesale HSA service provider's network are predominantly traffic-driven.

Positions of parties

78. TCC submitted that all wholesale HSA service providers should be required to assign usage-sensitive equipment to the traffic-driven portion of their cost models. TCC noted that when it develops cost studies for its wholesale HSA services, all costs associated with usage-sensitive equipment are assigned to this portion.

79. CNOC submitted that usage-sensitive costs should be assigned to the traffic-driven portion of the wholesale HSA service cost model, and that any costs that are not recovered through this portion could be recovered through the usage-sensitive rate component associated with speed-banding.

80. Shaw stated that all cable carriers' networks contain equipment and facilities in the access portion whose costs are usage-sensitive, making the distinction between the access portion and the traffic-driven portion artificial. Shaw opposed the removal of traffic-driven costs from the calculation of access rates, since doing so would not reflect the traffic-sensitive nature of Shaw's entire HSA network.

81. Bell Canada submitted that its practice is to assign usage-sensitive equipment to the traffic-driven portion of its cost models.

82. The Cable Carriers submitted that certain components of their fibre deployment and CMTS are assigned to the access portion of their networks, since these components are not usage-sensitive. They indicated that all other components that are usage-sensitive are assigned to the traffic-driven portion of their networks.

83. MTS did not support the need to assign usage-sensitive equipment to the traffic-driven portion of cost models. It submitted that equipment costs should instead be driven by capacity.

Commission's analysis and determinations

84. For the large telephone companies that use the CBB model for wholesale HSA rate-setting purposes, most of the costs of their usage-sensitive equipment are already accounted for in the traffic-driven portion of their cost models.

85. The large cable companies have some costs for usage-sensitive equipment in the access portion of their cost models (e.g. the CMTS chassis) that are traffic-driven. These usage-sensitive costs can be identified and removed from the access portion of cost models and assigned to the traffic-driven portion, whether the wholesale HSA service provider is using the CBB model or the flat rate model. This reassignment of costs would aid in the creation of speed-bands by reducing variability in the access costs between the various service speeds within a speed-band.

86. In light of the above, the Commission determines that wholesale HSA service providers must ensure that all equipment costs accounted for in the access portion of their cost models include costs only for non-usage-sensitive equipment.

How should the Commission determine final rates for destandardized services?

87. Since the publication of the 2011 Regulatory Policies, and as a result of the speed-matching requirement, the Commission has received many tariff applications for the approval of new wholesale HSA service speeds. Some of these applications have been approved on an interim basis, while others have been disposed of on a final basis.

88. Several of the proposed new wholesale HSA service speeds have been destandardized, and a number of these destandardized service speeds have rates that the Commission approved only on an interim basis. As well, several of the destandardization applications were filed without a supporting cost study, and so the interim rates were based on the rates for the nearest lower-approved service speeds.

Positions of parties

89. CNOC submitted that in cases where the interim rate for a destandardized service speed was based on the nearest lower-approved service speeds, the final rates should be set at the same levels as the corresponding interim rates, since destandardized wholesale HSA services no longer have a material presence in the wholesale HSA services market.

90. Bell Canada and TCC also stated that all destandardized service speeds with interim rates should be disposed of by making the interim rates final.

91. The Cable Carriers submitted that the existing interim rates should not automatically become final. Rather, the Commission should establish a final rate based on the record of each application. They argued that no new or updated cost studies should be required.

92. Shaw requested that the Commission set final rates based on cost studies submitted by the wholesale HSA service providers.

93. VMedia indicated that given the extensive modifications to the costing parameters that are likely to result from the current proceeding, the Commission should defer finalizing the rates for destandardized services pending the implementation of any such modifications.

94. Vaxination requested that the rates for destandardized services be changed to match the rates for the closest service speeds offered.

Commission's analysis and determinations

95. With the adoption of speed-bands, as determined above, destandardized service speeds will fall within proposed speed-bands, with each new speed-band being supported by a separate cost study.

96. If the Commission were to set the existing interim rate for a destandardized service speed as final without using the new cost information filed in support of the speed-band, wholesale HSA service providers would end up with multiple service rates within a speed-band, which would be burdensome and complex to administer for all parties involved, contrary to the objective of this proceeding.

97. The Commission determines that a more appropriate approach to address destandardized services would be to include the costs of these services in the calculation of the final rates for the respective speed-bands, and use the resulting speed-band rate as the final rate for the destandardized service speed. This approach is a simple and efficient means of bringing certainty to final rates that will apply to all destandardized service speeds.

98. The application of retroactivity will be best addressed once updated cost studies are filed and the rates for each speed-band are approved.

Should the Commission set rates interim for wholesale HSA services on the grounds that they may no longer be just and reasonable?

Positions of parties

99. CNOC requested that the Commission make interim all usage-sensitive rates for the wholesale HSA services offered by the following service providers: Bell Aliant Regional Communications, Limited Partnership; Bell Canada; Cogeco; RCP; SaskTel; Shaw; TCC; and Videotron.

100. CNOC submitted that the unreasonably high usage-sensitive rates are no longer just and reasonable, and that imposing excessive rates creates barriers to entry and prevents competition in the market for Competitors' new and emerging services, such as Internet Protocol television (IPTV), as well as for service bundles.

101. Bell Canada, SaskTel, and TCC requested that the Commission dismiss CNOC's application. In Bell Canada's view, many of the same arguments were raised in CNOC's application to review and vary Telecom Regulatory Policy 2011-703, and in CNOC's submissions in the wholesale wireline service proceeding. Bell Canada submitted that CNOC's claims that usage-sensitive rates are too high may pertain only to certain companies. Bell Canada, supported by TCC, further submitted that

CNOC has not provided company-specific evidence to demonstrate that usage-sensitive rates are excessive.

102. The large cable companies submitted that CNOC's application is based on the unsupported assertion that usage-sensitive rates are unreasonably high. These parties also argued that while CNOC had raised concerns about high usage-sensitive rates during the wholesale wireline service proceeding, it made no request to set rates interim at that time.

103. Vaxination supported CNOC's position that usage-sensitive rates are too high and that there is a need for a review of these rates. Vaxination agreed with CNOC's request for rates to be made interim until the Commission's review is complete, since the refunds would financially assist Internet service providers. Vaxination submitted that Competitors are unable to compete in the IPTV service market due to the higher bandwidth and usage requirements of this service. As evidence for its claim, Vaxination provided data from a 2010 study[21] conducted on U.S. Internet transit prices[22] to demonstrate that these prices are lower than current usage-sensitive rates.

Commission's analysis and determinations

104. In this decision, the Commission has (i) modified the rate-setting approach for wholesale HSA services, namely the creation of speed-bands with a single access rate for each band, (ii) adopted a new annual traffic growth assumption and a new annual unit cost change assumption, and (iii) changed the length of the study period for cost studies. Both the nature and scope of these changes indicate that current wholesale HSA service rates are likely not just and reasonable.

105. Making all wholesale HSA service rates interim, as requested by CNOC, would introduce regulatory uncertainty. However, the Commission has determined in this decision that changes are necessary to certain costing assumptions, which demonstrates that current wholesale HSA service rates are likely not just and reasonable. As well, wholesale HSA service providers will need to implement the changes set out in this decision, which will result in new rates. Consequently, the Commission hereby makes interim all current wholesale HSA service rates that are currently approved on a final basis, including the monthly capacity rate per 100 Mbps service.[23] The Commission will assess the extent to which, if at all, retroactivity will apply when new cost studies are submitted in support of revised wholesale HSA service rates.

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[21] DrPeering.net: Internet Transit Prices - Historical and Projected

[22] Internet transit includes all forms of Internet traffic, such as streaming, point-to-point connections, and virtual private networks.

[23] The wholesale HSA service rates being made interim are restricted to the monthly access rate per end-user, and the monthly capacity charge per 100 Mbps.

Implementation

106. The Commission **directs** all wholesale HSA service providers to file new tariff applications for banded non-legacy wholesale HSA service speeds,[24] reflecting the Commission's determinations set out in this decision, within **45 days** of the date of this decision. The Commission also **directs** wholesale HSA service providers that use the CBB model to file the updated monthly capacity charge per 100 Mbps within **45 days** of the date of this decision.

Secretary General

Related documents

- *Review of wholesale wireline services and associated policies*, Telecom Regulatory Policy CRTC 2015-326, 22 July 2015, as amended by Telecom Regulatory Policy CRTC 2015-326-1, 9 October 2015
- *Review of costing inputs and application process for wholesale high-speed access services*, Telecom Notice of Consultation CRTC 2015-225, 28 May 2015, as amended by Telecom Notice of Consultation CRTC 2015-225-1, 3 July 2015
- *Shaw Cablesystems G.P. – Introduction of five new third-party Internet access service speeds*, Telecom Order CRTC 2015-73, 2 March 2015
- *Canadian Network Operators Consortium Inc. – Application requesting enforcement of matching speed requirements with respect to third-party Internet access services provided by Rogers Communications Partnership*, Telecom Decision CRTC 2013-36, 31 January 2013
- *Billing practices for wholesale business high-speed access services*, Telecom Regulatory Policy CRTC 2011-704, 15 November 2011
- *Billing practices for wholesale residential high-speed access services*, Telecom Regulatory Policy CRTC 2011-703, 15 November 2011, as amended by Telecom Regulatory Policy CRTC 2011-703-1, 22 December 2011
- *Wholesale high-speed access services proceeding*, Telecom Regulatory Policy CRTC 2010-632, 30 August 2010
- *Review of the use of company-specific working fill factors and the recovery of past introduction costs not fully recovered*, Telecom Regulatory Policy CRTC 2009-274, 14 May 2009
- *Regulatory Economic Studies Manuals – Follow-up proceeding to Telecom Decision 2008-14*, Telecom Order CRTC 2008-237, 25 August 2008
- *Cogeco, Rogers, Shaw, and Videotron – Third-party Internet access service rates*, Telecom Decision CRTC 2006-77, 21 December 2006

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[24] In Telecom Regulatory Policy 2015-326, the Commission determined that rates for legacy wholesale HSA services, defined as services not provided over next-generation mixed fibre/copper networks, were to be frozen at existing levels.

Appendix to Telecom Decision CRTC 2016-117

The recovery of significant costs causal to a service over the life of the service or a reasonable period can be achieved by adjusting the PWAC[25] (only for costs causal to the service) as follows:

i. Calculate the PWAC (only for costs causal to the service) based on a five-year study period.

ii. Calculate the percent increase in PWAC (only for costs causal to the service) between the five-year study period and the life of the service or the reasonable period.

iii. Calculate the percent increase in the present worth of demand (PWOD)[26] between the five-year study period and the life of the service or the reasonable period.

iv. The adjusted PWAC (only for costs causal to the service) is obtained by a*((1+b)/(1+c)), that is multiplying the five-year study PWAC (as calculated in i. above) by 1 + percent increase in PWAC (as calculated in ii. above), divided by 1 + percent increase in PWOD (as calculated in iii. above).

v. In the calculation of the monthly cost of the service, the adjusted PWAC (only for costs causal to the service) should be used instead of the five-year study PWAC (only for costs causal to the service) calculated for the five-year study period.

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[25] The PWAC is the present worth of all causal costs (including taxes) typically at the beginning of the study period. This evaluator is used to establish the floor price of a service, i.e., the price at which a company is expected to recover all of its causal costs over a determined period of time. The PWAC is computed by summing up the present worth of expenses, capital expenditures, gross salvage, removal costs, income tax payable, and other applicable taxes.

[26] The PWOD expresses the forecasted demand over a study period as a single present worth value at the beginning of the study period. The PWOD is used to unitize the corresponding PWAC. The resulting cost per unit of demand reflects the minimum rate per unit of demand required for the service provider to break even.