

Cybera's Presentation to the CRTC
Review of wholesale service and associated policies
November 24, 2014

Thank you Mr. Chairman, Vice Chairman and Commissioners.

Introduction of Robin Winsor, President & Chief Executive Officer of Cybera
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Cybera Introduction

1. Cybera is a federally incorporated not-for-profit organization that operates and manages Alberta's unmetered research and education network as part of the National Research & Education Network.
2. Our mandate is to spur and support innovation, for the economic benefit of Alberta, through the use of cyberinfrastructure, with a large focus on enabling the public sector.
3. We have 60 member institutions, including post secondary institutions such as the University of Alberta and the University of Calgary, many of the colleges and a growing number of K-12 school boards. Today, Cybera's connectivity services 87% of Alberta's post secondary students and more than 52% of the K-12 students.
4. Additionally, we count several business incubators as members such as Innovate Calgary and TEC Edmonton. Broadband is essential infrastructure and a driver of innovation, especially as the Internet Of Things gives rise to new products, new business models and new companies.
5. Cybera does not own fibre assets directly. Rather, we are a user or consumer of existing infrastructure sources. Nor do we operate our own datacentres, instead using a mixture of university assets and commercial providers where appropriate to house our computing facilities.
6. We leverage the resources of our federal counterpart CANARIE, from whom the Commission will be hearing later in the proceedings, as well as the Alberta SuperNet, commercial services and municipal fibre to connect our members to the research and education network.

7. We are funded by membership fees from our institutions, by operating grants from the Government of Alberta and by project based funding from CANARIE (who in turn is funded by Industry Canada).
8. Cybera does not compete in the private sector market as this would be unfair given our access to government grants. Instead, we strive to maximize the efficiency of publicly funded institutions.
9. The focus of our response is on the socio-economic benefits of networking and the need to provide Adequate Regulatory Protection to consumers, especially in underserved areas of the country.
10. We are presenting our experience in Alberta as a case study.

Alberta SuperNet - Scarcity vs Abundance

11. The Alberta SuperNet was a strategic infrastructure investment by the Government of Alberta, using a public / private partnership model involving Bell Canada and Axia Net Media. It was completed in 2005. Final costs, including subsequent extensions, were in the order of \$330 million. At the time of completion, it represented the first jurisdiction-wide fibre optic network in North America designed to connect public institutions across the province – schools, hospitals, colleges, universities, libraries, and municipal offices – to a broadband network for high-speed internet access.
12. In reality, the Alberta SuperNet is a backhaul network (or ‘middle-mile’) that connects on one end to local access networks (or ‘first- or last-mile’) and on the other end to other networks that connect to the internet. The SuperNet does not directly serve residential homes, however, the intention was, and still is, to provide affordable wholesale internet access to local third-party Internet service providers through interconnection points (known as Points of Presence or PoPs).
13. These ISPs can then provide last-mile connectivity and Internet service to residents of the 429 SuperNet communities. In practice, however, the high-costs for non-incumbent ISPs to access essential infrastructure still prevents them from serving the Alberta rural market. This has led to some communities having unserved or underserved Internet needs despite having a SuperNet PoP.
14. The Alberta SuperNet represents an important Canadian example of how wholesale services regulation can have an important role in giving all Canadians access to high-speed Internet service.
15. Although many good things have come from the build of the SuperNet, it’s capacity has been vastly under realized and under utilized. These failures can be used to learn important lessons and guide the CRTC in regulating fibre access going forward.
16. An important lesson learned relates to the capacity of fibre networks and whether the resource should be regulated on a basis of scarcity or abundance. We will argue that, strange as it may seem, both apply here. Regulation tends to be required where there is insufficient resource for all and controls are needed to promote a fair distribution of that limited resource.
17. Scarcity comes from the fact that there are not many fibre optic cables in place today and based on that scarcity, regulation is required to ensure all Canadians have access by requiring carriers to share the resources. Canada is simply too large a country for us to be able to afford facilities based competition. We need services based competition instead.

18. Abundance comes from the advances in technology and the increasing carrying capacity of the fibre optic cables. I would like to illustrate this point graphically.
19. **Robin Winsor will illustrate his point by showing, and describing for the commissioners, a section of the Alberta SuperNet fibre.**
20. This cable is a piece of the Alberta Supernet. The main cable bundle is stiff and strong. Within it, there are 20 smaller cables. Within each of these 20 are a further 12 fibre optic strands so fine it may be difficult for the commissioners or the cameras to see at this distance. Just two of these strands, a single pair, is sufficient to join the two largest research institutions in Alberta with enough bandwidth for all their needs. Today that is 200 Gigabits per second. In the future it will surely be more but as the technology for the lasers that use this fibre advance it is inevitable that a single pair will carry more and more traffic. This cable has hundreds of such pairs. Once access to the cable is achieved the situation moves from scarcity to abundance.
21. Despite this huge carrying capacity, the Supernet remains unavailable at affordable rates to the universities and millions of dollars are being spent by federal and provincial governments to buy capacity from Bell Canada and other major carriers to link the province's post secondaries and indeed the K-12 schools while the Supernet remains inaccessible and underused. Why?
22. The rate setting done when the Supernet was built and contracts written did not adequately provide for the huge change in internet use, demand for bandwidth and new technology. This is an important lesson that we hope the commission will take to heart when helping Canadians access these services. Access must be done through economic regulation within the power of the commission to adjust at regular, and at least semi-annual, intervals. To fix a rate in policy or in a contract, or worse to enshrine it in primary legislation, is to ignore the tremendous rate of change in this sector.
23. We believe that full reviews of wholesale services at approximately three year intervals are required. Outside of the full reviews however, we believe it is also necessary for the commission to be able to make semi-annual adjustments to rates based on performance measures such as a flexible economic benchmark that would monitor and be inclusive of the fast-changing cost structure associated with high-speed internet access services. In this system, benchmarks or targets would be updated at least annually, and ideally semi-annually, based on average internet costs and speeds within a peer country or group of peers, such as other G7 nations. This will ensure that Canadians are receiving the highest quality and best priced internet, and that the country as a whole remains a leading nation when it comes to technology adoption.

24. Further illustrating the problem of locking into long-term contracts during times of rapid technological change, we have observed significant disparity in the internet prices paid by public institutions. For example, in the education sector, one school reported paying \$185 per Mbps in rural Alberta at a time when other post secondary institutions in urban communities were paying less than \$10 per Mbps.
25. In 2011, Cybera instituted an Internet Buying Group to help increase the purchasing power of public institutions by aggregating their demand. This Internet Buying Group has spurred the major carriers to compete for the internet buy of Alberta's educational institutions, and in so doing has dropped rates from hundreds of dollars to around ten per Mbps.
26. Cybera has also found through its experience with the Internet Buying Group that bandwidth prices in Alberta are dropping faster than expected. This is due to the increased number of users in the Internet Buying Group, which join because they realize it is the only way to obtain reasonable rates from the dominant carriers. The price of bandwidth is also decreasing as very large internet service providers move into Canadian cities. In response, Cybera has increased the frequency of its review of its Internet Buying Group pricing from annually to bi-annually, dropping our prices to members at each review, and we suggest that similar reviews of rate-setting by the CRTC be held frequently.

Urban vs Rural Disparity

27. Currently, there is a lack of high-quality, high speed and affordable internet service in rural environments. Regulating wholesale high-speed access services such as FTTP to rural towns will help to ensure that rural residents, businesses and cultures thrive and are not lost to large urban centres. The digital divide between urban and rural markets will continue to grow unless action is taken.
26. The rural town of Olds, Alberta, population 8,500, provides an excellent example of a pro-active approach to combating the digital divide. This community built its own fibre network (O-Net) and started its own not-for-profit internet service provider as a means to attract technology companies to the town. It now offers an internet speed of a gigabit per second at reasonable rates and expects 50% of the population to connect in 2014.
27. This is a great start but without regulation it doesn't reach far enough.
28. Consider the case of two children who attend school in a small Alberta town. During the day, in class, they have access via the school's internet connection to worldwide educational resources. After school however the situation changes. A child who goes home to a house within the small town will likely have service available from a wireless ISP and can use tools such as Google, Wikipedia and others to do his homework.
29. Another child goes home to a farmhouse a few kilometers outside town where there is little or no connectivity. She will be stuck with 20th century tools such as an encyclopedia or dictionary. The next day when the children return to school what will the teacher do? Will she separate the class, saying 20th century learners to one side of the room and 21st century to another? Will she teach to the lowest common denominator holding all the children back? This is an unacceptable situation and one that will have long-term economic impact on Canada if we continue to raise a generation of digital haves and have-nots.

Setting Upload/Download Targets

30. In Canada, the CRTC's basic service objective (Decision 2011-291), established a baseline internet availability target of 5 Mbps download and 1 Mbps upload rates for all Canadians by 2015. Cybera believes that these targets should now be considered too low, based on current and expected uses of the internet in the near-future.
31. We believe that the basis for setting such targets should be the ability of Canadians to use the internet interactively, and not just as passive consumers. As such, upload speeds have to be higher, and should be symmetric with download speeds to allow consumers to carry out digital activities such as videoconferencing and telecommuting.
32. Moreover, the baseline download and upload targets should be updated frequently to match leading international benchmarks. Cybera recommends setting a near-term target of 35 Mbps symmetric internet bandwidth target for all citizens by 2018, which would place Canada among the current top 20 countries for average internet speeds, and a 2020 target of 100 Mbps symmetric internet bandwidth.
33. For consumers to use these high speed connections, they must be able to have confidence they will actually receive them. Most commercial plans today specify speeds as "up to" a certain rate. If Canadians are to use these connections to their full potential, speeds must be specified as "at least", thereby setting a useful floor rather than a theoretical ceiling. Such a change will require regulation.
34. Let me describe how high-speed symmetric connectivity can serve to promote both cultural and economic development.
35. In Cybera's Calgary and Edmonton offices, we use telepresence robots to allow staff to work from anywhere in the world, or at least anywhere with good connectivity, and yet be "physically" present in the office with their colleagues. These telepresence robots are cheap, costing less than a fully configured laptop computer. They use a Segway style base and a tablet for a head. We had hoped to bring one today but had a little trouble getting it on the flight from Calgary.
36. Although simple sounding, the difference between a telepresence robot for a remote worker and the more traditional "work from home" model where the worker is not seen through the day except when they make a Skype call to colleagues or to join a meeting is considerable. I myself have found that when using such a robot and encountering others who do not know me, I am treated much the same way as a disabled worker.
37. People are a little friendlier, they hold the door for you a little longer and are happy to help a coworker who is just a little less mobile than their able bodied colleagues. For all they know, I may be confined to a hospital bed and this is how I go to work. Indeed it could be.
38. So what does this mean for economic development beyond the obvious opportunities for disabled workers?

39. Consider if you will the vast natural resources in northern Alberta's oil sands.
40. In recent years the mayor of Fort McMurray called for a slowdown in oilsands development for the simple reason that the town could barely accommodate the influx of workers from across Canada and around the world.
41. With adequate symmetric bandwidth, telepresence robots could be used and, for many jobs, workers need not be physically present in Fort McMurray. Indeed pervasive fiber-optic networks would allow those workers to be drawn from across the country, sharing the wealth creation and employment opportunities without the carbon footprint and stress on the town of flying them in and accommodating them.
42. For a cultural example from the other end of the province , consider the benefits of symmetric broadband to a UNESCO heritage site like Head Smashed In Buffalo Jump in southern Alberta. With adequate fiber connections, telepresence robots can allow visitors from Victoria to St. Johns to connect to a robot and explore the world class museum at the site. Very few of these potential visitors would ever have the chance to visit in person.
43. To carry it even further, they could use technology such as Google hangouts on mobile devices to meet a member of the local first Nations community, get a guided tour of the site and explore their culture. This rich immersive and interactive cultural experience does not require new technology to be developed but only fair and open access to the essential telecommunications infrastructure that is within the power of the CRTC to regulate.
44. Some of these opportunities are profitable at one end of the wire, but not the other. Some are not profit driven at all but go to promotion and preservation of Canadian culture. The dominant carriers can be counted on to address the profitable portions. We hope the commission will require that they also operate in such a manner that all Canadians and Canadian culture will be served as well.
45. Previous CRTC telecom decisions (e.g. 2010-632) which regulated the wholesale service industry made cable and dial-up internet services more affordable in Canada. Given the country's low population density, service-based competition must displace facility-based competition. Giving small providers mandated access to FTTP infrastructure will facilitate market competition and ensure consumers gain access to high speed connections at reasonable rates.

46. Regulation will also provide protection from the large carriers abusing their dominant position by entering small markets and serving only the most profitable areas, such as the business core. Drawing again on the example of Olds, Alberta their business case shows that the community broadband initiative can be cashflow positive within a year of the build out assuming there is a sufficient take rate from the community. If a major comes to town and offers services for voice and internet via fiber to the businesses in town, the community broadband is left with the task of serving the less profitable residential market. The reduced take rate and profitability per customer served means that the business case no longer works and the residents may never get high speed connection. Hollowing out the middle of small towns is good business for carriers and bad for the people who live there. In an unregulated market, that is exactly what we expect to see happening.

Conclusion

47. Our message is clear: networking infrastructure is essential, and therefore it needs to be regulated. We are concerned that as technology changes rapidly, the regulation must keep up. Excellent results have been achieved through the commission's regulation of telephone service. Internet access, and access to the separate, but also very important, research and education network, is increasingly dependant on access to fibre connections in order to achieve the bandwidth required for modern, and future, use. Fair, affordable, non-prejudicial access to this fibre will not happen without regulation. Without such access, Canada's digital economy cannot reach it's full potential.