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Regulating Voice over IP:

A solution for the CRTC

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Executive Summary

Voice over Internet Protocol (VoIP) is a capability that has moved into the mainstream. Telecom regulators around the world are being challenged to issue policy determinations to govern the industry as incumbent telephone companies and new competitors introduce competitive services based on VoIP technology. The Canadian Radio-television and Telecommunications Commission (CRTC) has issued a preliminary determination that views VoIP as just another technology upgrade to deliver conventional local phone service. As such, the CRTC has initially proposed that VoIP would be regulated in the same way that regular phone service is regulated: full regulation for the phone companies; light regulation for new competitors.

We disagree. In our view all VoIP service providers should be treated equally, with regulation limited to public safety, social and consumer protection issues. Contrary to its initial views, the CRTC should not extend price regulation on to include VoIP services.

We have 3 reasons for our view: First, VoIP service dissociates the voice application from the physical infrastructure (i.e. the line). VoIP transforms voice

into a customer premises based software application. The CRTC has rightly moved away from regulating such applications in the past, including the applicability of Contribution payments, and it does not have any reason to act differently in this case. The fact that such an application can be used as a substitute for a regulated service like voice, does not mean that economic regulation for VoIP is warranted.

Second, we suggest that the regulator needs to return to first principles, and ask the question of "why regulate?" In telecom, regulation has been required where facilities (the hardware and software infrastructure) created a bottleneck. If a single provider had market power through its control of the bottleneck facility, regulation was required to discipline that market power. Conventional voice service has been sold as an inseparable bundle of a voice application and network access. The network access portion was historically a bottleneck facility that required regulation. By contrast, VoIP services on the market today are only software applications. In examining the issue of whether to regulate, the CRTC has to determine whether anyone has market power in respect of the voice application. Given the number of new entrants in VoIP, it is unlikely that anyone could be found to have such market power. The confusion in this debate arises when network access is bundled along with VoIP. In those situations, our suggestion to the CRTC is that their current bundling rules are sufficient to deal with the issue. If a VoIP service is bundled with network access and that access is subject to market power, regulation should be used to keep the power in check. However, if the bundled network access is competitive, such as the CRTC has found in the case of high speed internet access, no economic regulation is required for the providers of VoIP services.

Finally, the CRTC has a useful precedent to draw upon in deciding the issue of VoIP regulation. Like VoIP, mobile wireless services share many of the same characteristics of conventional voice service. Yet, when wireless services were first introduced, the CRTC found that Canadians would obtain the greatest benefits if wireless services were governed, as much as possible, by market forces rather than by regulation. Such thinking has contributed to the success of competition in wireless services in Canada. The CRTC now has an opportunity to obtain similar success in VoIP.

We believe that all VoIP service providers that make use of Canadian numbers should be regulated in respect of providing access to emergency services and maintaining responsible levels of consumer privacy. However, regulation should be limited to the most fundamental consumer safeguards and ensuring that all market participants have fair and equitable access to bottleneck facilities. As such, as long as the voice application is unbundled from the access facilities, there is no need to regulate the price of VoIP service. Conversely, if the application is bundled with an access service that is not competitive, the Commission's existing bundling rules will come into effect.

Wireless services and VoIP are the leading trends in telecommunications around the world. The CRTC had it right when it found that "the benefits which users may derive from this innovative service are likely to be greater if the terms of its provision are governed, as much as possible, by market forces rather than by regulation." It used these words more than 20 years ago in respect of wireless services. It should reach the same conclusions today in respect of VoIP.

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Introduction

Regulators regulate. It is just what they do. It is in their job descriptions to regulate. In fact, the Telecom Act requires the CRTC to begin with the presumption that it has to regulate, until it is provided with proof that it does not need to regulate.¹

In other areas of technology, entrepreneurs compete against larger companies and sometimes win and sometimes lose depending on what the marketplace decides. Larger players are often slow to respond to competitive threats, but are free to do so, subject to commercial business and competition laws. Not so for telecommunications services. Like most countries around the world, in Canada telecommunications services are regulated by a specialist body, the CRTC – the Canadian Radio-television and Telecommunications Commission. However, unlike the regulators in many of Canada's most important trading partners, the CRTC continues to approach new technologies and services with a presumption that it must regulate them.² It isn't surprising. It's just what the legislation encourages the regulator to do.

This paper will argue that Internet telephony does not need to be subjected to retail price regulation; that market forces are the best mechanism for maximizing

¹ Telecommunications Act, S.C. 1993, c.38, Section 34 provides relief from regulating only after making a determination as a question of fact that it does not need to regulate. Such a determination allows the CRTC to refrain from regulating under Sections 24, 25, 27, 29 and 31 – which limit the abilities of carriers to offer services without prior approval of the Commission.

² By contrast, the New Regulatory Framework for Electronic Communications for the European Union reverses the presumption for regulation. The EU requires its member states "to promote competition in the provision of electronic communications networks, electronic communications services and associated facilities and services" (Framework Directive, 2002/21/EC, OJ L 108, 24.4.2002, Article 8.2). In Canada, fostering an "increased reliance on market forces" is but one of eight competing objectives cited in Section 7 of the Telecom Act, with no particular precedence given to one over the others.

consumer benefits such as increased choice, encouraging innovation and lower prices; and, that forbearance from rate regulation of VoIP is consistent with the approach followed by the CRTC in other areas of new technology, such as mobile wireless services. The paper will review the issues that were examined during the CRTC's Voice over Internet Protocol (VoIP) public proceeding and propose a light-handed and efficient regulatory treatment that allows consumers to benefit from increased innovation, based on competitive market forces. The role of the regulator in VoIP should be limited to ensuring certain consumer safeguards are maintained and enforcement of equitable access to bottleneck facilities by all market participants.

Why regulate?

Contrary to the views of many observers that the Internet can not be regulated, the CRTC indeed has the power to regulate VoIP. It certainly has the ability to limit the involvement of Canada's largest phone companies in this sector, if it chooses to regulate VoIP in the same manner that it deals with conventional telephone service. But, the proper question isn't "can they regulate?" It is: "why would the CRTC want to regulate?"

The CRTC is required to regulate with a view to the implementation of eight sometimes competing Canadian telecom policy objectives.³ It has typically regulated by trying to balance the interests of consumers, incumbent carriers and competitors. One of the policy objectives set out in the Telecom Act is 'to foster increased reliance on market forces,' which has led the CRTC to forbear or refrain from regulation in a number of markets. The Act requires that the CRTC refrain from regulating a service where the CRTC determines that there will be

³ Telecommunications Act, S.C. 1993, c.38, Section 7.

sufficient competition to protect the interests of users.⁴ The Commission's criteria for making such a determination have been that significant barriers to entry have been removed and that workable competition either exists or will occur within the next two years.⁵

Regulating VoIP On The Basis Of Functional Equivalence

In response to industry requests to examine the regulatory issues surrounding VoIP, the CRTC began a public notice process to figure out how to deal with this major disruptive force on the telephone service – a technology that promises to turn the entire industry on its head.⁶ Sometime in early 2005 we will hear what the CRTC decides.

Partly recognizing that technologies were moving faster than the CRTC could, the Commission took the unusual step of stating its preliminary views on VoIP, as an indicator of what key issues upon which people should comment. The CRTC's view was that on the basis of functional equivalence and technological neutrality, VoIP should be subject to the same regime as conventional voice service.

VoIP services utilize telephone numbers that conform to the NANP and allow subscribers to call and/or receive calls from any telephone with access to the PSTN anywhere in the world. In the Commission's preliminary view, these characteristics of VoIP

⁴ Telecommunications Act, S.C. 1993, c.38, Section 34 (2).

⁵ Review of Regulatory Framework, Telecom Decision CRTC 94-19, p.69

⁶ As noted in Regulatory framework for voice communication services using Internet Protocol, Telecom Public Notice CRTC 2004-2 ('PN 2004-2'), at paragraph 6: "On 6 November 2003, Bell Canada submitted an application requesting, among other things, that the Commission commence a proceeding to address the rules, if any, which govern the provision of telecommunications services by cable companies and other service providers that offer VoIP services. On 12 January 2004, Call-Net Enterprises Inc. submitted a letter asking what regulatory requirements would apply to service providers that are now offering VoIP services."

services are functionally the same as those of circuit-switched voice telecommunications services.

Consistent with the principle of technological neutrality, in the Commission's preliminary view VoIP services should be subject to the existing regulatory framework, including the Commission's forbearance determinations.⁷

Not surprisingly, the Canadian Cable Telecommunications Association (CCTA), among many others, agreed with the CRTC's preliminary view. The CCTA said that VoIP is a 'close substitute for existing primary exchange services.'⁸ 'VoIP services are used to provide local exchange service, as well as long distance service and calling features, just as circuit-switched voice services are today.'⁹

While the substitutability of VoIP for primary voice service is certainly correct, the improper conclusion, to treat VoIP as simply a direct technology substitute for conventional phone service, was drawn by the CRTC in its preliminary determination. It is true that VoIP services make use of regular phone numbers and most VoIP services allow subscribers to call and/or receive calls from any other telephone in the world. While these characteristics may appear to be functionally the same as regular phone service, they are only a subset of the capabilities of VoIP and provide an incorrect basis for regulating VoIP. Further, mobile wireless service would appear to pass the same tests of functional equivalence and yet the CRTC has historically decided not to regulate retail mobile rates.

⁷ PN 2004-2, Paragraphs 22-23.

⁸ Paragraph v, page iv. CCTA Reply Comments, PN 2004-2, October 13, 2004.

⁹ Paragraph ii, page iv. CCTA Reply Comments, PN 2004-2, October 13, 2004.

VoIP has been described in a number of different manners. The CRTC differentiated between PC-to-PC communications (which it categorized as 'retail internet services' and would therefore be unregulated) and other forms of VoIP that are interconnected to the public telephone network. Most consumer VoIP services being offered today are unbundled from the high speed internet access in that the customers add a device (known as an analog terminal adapter – or ATA) to their existing home internet service. This type of service has been called 'access-independent VoIP service' in the course of the CRTC proceedings. Other VoIP services will be more tightly coupled to the high speed internet service, providing better control over certain metrics for quality of service and better location identification. Such bundled offerings have been termed 'access dependent VoIP service.'

Fundamentally, VoIP, as a service, does not bundle any bottleneck facilities (such as the copper wire) which should form the basis of regulatory concern for the CRTC. One of the reasons that VoIP service is less expensive than traditional phone service is that the customer has already paid for the connection line through their subscription to a high speed internet service. VoIP is a service that has enabled users to liberate their voice service from the distribution network.

In our view, we do not believe that mere functional equivalence to conventional phone service is a sufficient reason to justify the application of regulation by the CRTC. For example, the rental of DVD movies shares many functional characteristics with cable television, from the perspective of the viewer. DVD rentals are often a substitute for cable TV. Yet no one is suggesting that Rogers Video stores should be regulated the same way that cable TV is licensed. In a sense, DVDs permit users to liberate their programming from the regulated distribution networks, similar to VoIP enabling the decoupling of voice service

from a particular distribution network. Once again, the question is not whether services are functionally equivalent, but rather whether there is a compelling reason for the regulator to intervene and regulate the retail rates of VoIP service providers.

Evidence of Competition or Market Power

Based on the wide number of competitors, it seems obvious that there are virtually no barriers to entry with VoIP service. The centralized equipment costs a fraction of the capital required for conventional phone service. With customers providing their own high speed internet connections, VoIP competitors do not need to buy access to any bottleneck facilities on behalf of their customers. Other than phone numbers and connections to the public network (both of which can be obtained from a large number of Local Exchange Carriers), VoIP service providers can easily enter the marketplace and expand their capacity at relatively low cost.

Following in the footsteps of Eastlink's overwhelming success in Atlantic Canada, which has resulted in Aliant losing almost 30% of the residential market in Halifax, all of Canada's major cable companies have announced entry into the telephone business by the middle of 2005¹⁰. Canadian cable companies are expected to be serving nearly 600,000 residential customers with VoIP

¹⁰ See, for example, Videotron's announcement of its commercial launch of residential phone service on January 24, 2005; Shaw announcements at 2005 Annual General Meeting for early 2005 service launch; Announcement by Ted Rogers at a CSFB Media and Telecom Week investor conference on December 9, 2004; Videotron briefing to analysts as reported in National Post on December 17, 2004; Announcement by Louis Audet on December 2, 2004 that Cogeco will launch VoIP in 2005; MTS-Allstream announcement on October 5, 2004 that Mountain Cable will use Allstream's Network Resident IP Telephone Service for its rollout of voice services.

technology in the next three years and close to 100,000 business lines in the same period.¹¹

On the other hand, to date, the major incumbent telephone companies have only launched business-grade services, which are in their earliest stages of market entry. Over the next three years, incumbents are expected to win only half the number of residential VoIP subscribers while capturing about 600,000 business VoIP lines.¹²

VoIP as an Application

More than a dozen companies are now offering fully featured local and long distance phone services using VoIP. Most of the traditional calling features, such as call waiting, voice mail, calling line identification are reproduced by nearly all of the VoIP providers. But they are also offering so much more. For example, when Primus Canada launched its pioneering VoIP service a year ago, it gave its customers the ability to be nomadic with their service, literally allowing customers to take their phone number with them when they traveled. Customers in one city could have a phone number assigned from another city thousands of miles away. Other novel services included the ability for residential users to transfer calls to another line or launch 5-way conference calls, capabilities

¹¹ NBI/Michael Sone Associates Inc., Canadian Local Telecom Services Market Report Overview, 2004 Edition, November 2004. Residential numbers are sourced from Page 5 business line numbers are from Page 7.

¹² *ibid.*

formerly in the exclusive domain of business users.¹³ Other features allow voice mail to appear as an email attachment or be heard through any web browser.¹⁴

Canadians have already begun canceling their traditional phone lines and substituting a number of alternate solutions, including wireless services and VoIP. According to a recent NBI/Michael Sone Associates study,¹⁵ by the end of 2004, more than half a million wireless subscribers no longer used wireline phone services. Over the next three years, more than one million residences will switch to VoIP.¹⁶ Mobile wireless and VoIP are proving to be substitutes for primary wireline services.

While VoIP services certainly can be used to substitute and replace traditional phone lines, VoIP offers much more. VoIP is an attractive service because of two significant distinctions from regular phone service. First, there is a vast pool of software development creativity that can be applied to develop new capabilities for your phone service, because the service is based upon open standards and the universal Internet Protocol (the 'IP' of VoIP). This is very different from classical phone service where software development was constrained to proprietary languages controlled by the 2 or 3 major switching manufacturers that supplied most of Canada's telecommunications infrastructure. And secondly, most of the VoIP providers offering service today are completely independent of the broadband internet services that connect customers to the public Internet.

¹³ Primus Canada press release. January 8, 2004. PRIMUS Canada launches Canada's first high speed Internet-based residential phone service.

¹⁴ For example, see features of Vonage Canada <http://www.vonage.ca/features.php>

¹⁵ NBI/Michael Sone Associates Inc., Canadian Local Telecom Services Market Report Overview, 2004 Edition, Page 3, November 2004.

¹⁶ *ibid*, Page 6.

Most of today's VoIP is just dial tone; the customer provides the high speed internet access line, often using an internet service provider that is different from the VoIP service provider. With conventional phone service, the customer purchases a bundled service: dial tone and an access line. Regardless of the service provider chosen by the customer, the access line is generally provided by the incumbent phone company. By de-coupling the link between access and dial-tone, VoIP service providers have been able to operate with significantly lower costs and they are not dependent on the incumbent carriers, their competitors, for installation of new service.

The CRTC Proceeding on VoIP

In Telecom Public Notice CRTC 2004-2, Regulatory framework for voice communication services using Internet Protocol, the CRTC invited public comment on the preliminary views it set out in the Notice, as well as other matters in respect of VoIP.¹⁷ The CRTC's preliminary views were expressed on three main themes: regulation of VoIP service offerings; the delivery of consumer safeguards such as emergency (911) services, message relay service and privacy protection; and, whether VoIP services should participate in the subsidy scheme, known as 'Contribution,' to lower the price of phone service in high-cost areas.

Regulation of VoIP

A challenge for regulators, in Canada and other jurisdictions, is how to treat VoIP for regulatory purposes. Despite the common view that the Internet is beyond the reach of regulation, constraints on the use of phone numbers are a means of

¹⁷ Paragraph 30, Telecom Public Notice CRTC 2004-2, Regulatory framework for voice communication services using Internet Protocol.

controlling VoIP services for non-regulated entities, such as resellers and foreign-based service providers. After all, most VoIP customers will want to receive calls originating on public telephone networks which will require the assignment of a telephone number. As a public resource, numbers provide a distinguishing point that can be regulated, should the regulator choose to do so.¹⁸ A regulator could establish conditions on regulated local exchange carriers in the assignment and use of telephone numbers by parties. Indeed, it has been suggested that VoIP service providers should be denied access to numbers until they are able to comply with the complete suite of obligations for local telephone competition.¹⁹

The CRTC asked for comments on whether "VoIP services should be subject to the existing regulatory framework, including the Commission's forbearance determinations."²⁰ It is our view that VoIP services should be subject to the existing regulatory framework for cellular services, not for primary exchange services. In order to reach this conclusion, we explore the regulation of conventional voice and cellular technologies, before turning to the question of how to regulate VoIP.

The Regulation of Conventional Voice Technologies

Conventional voice services are heavily regulated for incumbent telephone companies. Tariffs must be filed and approved in advance of any service being

¹⁸ It is doubtful that a regulator could effectively regulate VoIP in the case where the service provider assigns foreign telephone numbers to its customers. Such a product may have some appeal but will not become a mainstream substitute for local phone service until such time that long distance charges disappear.

¹⁹ See, for example, paragraph 109 of Reply Comments of Quebecor Media Inc., 13 October 2004, Telecom Public Notice CRTC 2004-2, Regulatory framework for voice communication services using Internet Protocol.

²⁰ Paragraph 23, Telecom Public Notice CRTC 2004-2, Regulatory framework for voice communication services using Internet Protocol.

offered to the public, or in advance of any change to the features or pricing. In addition, incumbent companies are required to provide competitors with access to unbundled network elements, where these components have been found to be bottleneck facilities or have been determined to be necessary inputs into a competitor retail offering.

We believe that it is appropriate to continue such an approach to regulation of traditional voice service, but only for as long as incumbents are found to be dominant or control the supply of bottleneck facilities – most notably, the access facilities.

An examination of the regulatory treatment for various types of voice service may be simplified by dissecting the elements that are combined to create the services. In our view, each end of a phone call, for all voice services, whether conventional, cellular or VoIP can be decomposed into two parts: a 'voice application' and 'access.' The transport portion (ie. the network cloud) is excluded for this part of the analysis.

A proper decomposition of a voice call reveals that users are being provided with an access element over a copper loop (or more often, a hybrid copper / fibre access network) combined with a switching element, that can be considered to be the voice application element. Since the introduction of common control switching machines in the 1950's, the voice switch has had a form of central processor with an associated user database. Modern digital switches are primarily a software system with voice services defined through various application software programs. The voice switch examines a database containing a user service profile that determines the features defined for each subscriber. The dial tone application is integrated into the switching machine operated by

the local exchange carrier providing conventional phone service. The functionality of a switch has been to provide the voice services application, including the interpretation of dialed digits and proper routing based on these dialing instructions. It is our assertion that the voice application component of a conventional voice call is competitive, and has in fact already been determined to be competitive by the CRTC.

Switching systems have been acknowledged as being readily available for purchase by competitive telecommunications service providers. In its Decision 97-8, the CRTC found that switching is not an "essential service"²¹. That is, the switch could be easily purchased by competitors without any particular advantage accruing to the incumbent service providers. As such, switching – which is the vehicle providing the voice application – is competitive.

On the other hand, a number of elements associated with the access component have been found not to be competitive, but in fact a bottleneck facility. Competitor access to these access components was mandated,²² including conditions on the rates, conditions of service and guaranteed access to resell these elements.

For conventional voice services, it has simply not been possible to dissociate the competitive voice services application provided by the switch from the access

²¹ Telecom Decision CRTC 97-8: Local Competition, Paragraph 93: "... switching equipment is readily available, in a wide variety of sizes and configurations, including host/remote or modular arrangements that would allow CLECs to compete with ILECs. In addition, the evidence indicates that a number of potential local competitors already possess switching functionality and that some of these will likely provide this functionality to other CLECs. Accordingly, the Commission finds that local switching is not an essential facility."

²² The access components initially included the local loop, collocation space in the central office and have recently (in Decision 2004-46) been extended to include elements of the local network.

component in order to offer a separate retail service. As such, since the competitive voice application is always bundled with the non-competitive access component – the entire retail service bundle is subject to regulation.

We would assert that the CRTC could find inspiration in this determination that is applicable to other services and technologies as seen in Table 1, below. We believe that the unbundling decision permits the CRTC to determine that the voice application itself is competitive – regulation for conventional voice service is dictated by the bundling of the voice application with non-competitive access, which dictates that incumbents be regulated until there is no longer evidence of market power for the bundled service.

Technology Platform	Access	Voice Application	Regulatory Treatment
Wireline Voice	Copper loop is Non-competitive	Competitive	Regulated Bundle
Mobile (PCS / Cellular)	Spectrum is Competitive	Competitive	Forborne Bundle
Long Distance	Wireline Voice	Competitive	If it is bundled, it would be regulated.
VoIP (sold with access)	High Speed internet access is competitive Rates are forborne	Competitive	Forborne Bundle if access is forborne.
VoIP (unbundled access)	Customer provides high speed access	Competitive	Forborne Service

Table 1: Examining Bundling for various voice services

Such a finding is at the root of the current regulatory regime for incumbent wireline voice services. Until such time as there is evidence of the erosion of the incumbent’s market power, under the bundling rules, the service delivered to the customer will continue to be regulated because one element of the voice service bundle, the copper access, is regulated as a bottleneck facility.

Contrast this “bundle” with other services and technologies. In the case of mobile (cellular) service, the access is competitive, together with the voice or messaging applications. Therefore, under the bundling rules, the service offered by the mobile carriers can be forborne. In the case of long distance services, if the service is bundled with a regulated service, such as traditional local service, the bundle would be regulated. But sold on a stand alone basis, long distance service is competitive, and therefore is now forborne. As a result, incumbent carriers do not typically bundle competitive long distance with their local voice service offering.

VoIP represents a technological leap in its ability to break the traditional bond that tied the voice application to access.²³ VoIP enables the decoupling of the voice application from the access facilities for the first time. This enables various forms of network architectures, including locating portions of the application on the customer premises, or in a central office, or in multiple locations (for network survivability). The application that provides the voice service is not tied to a bottleneck access. As a result, there is no need to regulate the voice application being offered to the consumer.

The Regulation of Wireless Services

Cellular / PCS wireless services were launched in Canada in 1985 following licensing and regulatory process determined in 1982 through 1984. Initially, services were offered by only two companies: Cantel (now operating as Rogers Wireless), and the wireless affiliates of the incumbent phone companies.

²³ While access lines can sometimes be provided separately from the provider of the traditional voice service, VoIP permits a complete decoupling of access from the application. The user is able to geographically relocate their service without consulting or advising either of the access providers nor the voice service provider.

Regulation of the industry was very light. As a condition of licensing, the phone company affiliates were restricted in launching services until 6 months after the incumbent carriers had a signed and approved interconnection agreement with Cantel – their competitor.²⁴ There was recognition at the time that Cantel would be reliant upon connections to the public telephone network and the Minister of Communications sought to ensure that the incumbents and new entrants had a fair opportunity to address the market. The start-up rules were rescinded in August 1995.

For its part, the CRTC recognized that cellular service was a form of telephone service, and therefore mandated interconnection between cellular networks and the public telephone network.²⁵ Nonetheless, the CRTC was predisposed to let market forces guide innovation from cellular services. The Commission felt that cellular companies (both Cantel and the telephone company affiliates) should be free to offer services without the need for tariffs to be filed first.

... the Commission considers that as a matter of regulatory policy it is neither necessary nor desirable, at this time, that Cantel or an arms' length telephone company affiliate be required to file tariffs for the provision of cellular service to the public. This conclusion is based on the Commission's opinion that the benefits which users may derive from this innovative service are likely to be greater if the terms of its provision are governed, as much as possible, by market forces rather than by regulation. In the case of telephone

²⁴ Industry Canada Notice DGTP-006-95 describes the start-up rule as follows: "When the Minister of Communications announced, in March 1984, that July 1, 1985 would be the official start-up date of cellular services in Canada, he added the proviso that, while in general any cellular service provider could begin offering services on that date, telephone companies would be permitted to commence service only after six months had elapsed following the signing and regulatory approval of an agreement which gave interconnection rights to Cantel. The purpose of this condition was to ensure that Cantel and the wireline telephone company affiliates had an equal opportunity to capture a share of the cellular market."

²⁵ Section III.B.1, Telecom Decision CRTC 84-10, Radio Common Carrier Interconnection With Federally Regulated Telephone Companies.

company affiliates, this conclusion is also conditional on there being adequate safeguards to ensure that their cellular activities are at arms' length from, and are not cross-subsidized by revenues from, regulated telephone company activities. Accordingly, the Commission has determined that, pursuant to section 320(3) of the Railway Act, both Cantel and any arms' length telephone company affiliate may charge tolls to the public for cellular radio service for which tariffs have not been filed.²⁶

Subsequently, bundling rules and price cap regulation have removed both the ability and incentives for telephone companies to cross-subsidize their cellular business with revenues from the regulated side of their businesses.

The CRTC's authority to forbear from regulation was rejected by the Federal Court of Appeal in 1989²⁷ and the CRTC was forced to require all companies to file tariffs, until such time that the new Telecommunications Act (1993) provided the Commission with the explicit power to refrain from regulating certain services and certain carriers. Shortly before the Act came into force, the CRTC issued a public notice to announce its plans to de-tariff wireless services,²⁸ and it confirmed this decision in August 1994.²⁹

Prior to forbearance being granted, in each of these decisions, the safeguards that were sought ensured that competitors would: have access to essential facilities of the telephone company (such as interconnection of their networks, telephone numbers, etc.); be protected from having to compete against telephone company affiliates with an ability to cross-subsidize and ensuring that

²⁶ Telecom Public Notice CRTC 1984-55, Cellular Radio Service.

²⁷ Federal Court of Appeal *Telecommunications Workers' Union v. CRTC and CNCP Telecommunications* (1989) 2 F.C. 280

²⁸ Telecom Public Notice CRTC 93-64, Regulation of Wireless Services Provided by Canadian Carriers, 13 October 1993.

²⁹ Telecom Decision CRTC 94-15, Regulation of Wireless Services, 12 August 1994

the cellular activities of the affiliates are conducted at arm's length from regulated activities.³⁰

Developing VoIP Regulation

The pre-amble to the CRTC's VoIP Public Notice contains contradictory messages. On one hand, it states "In the Commission's preliminary view, its existing regulatory framework should apply to VoIP services, including its determinations related to forbearance." This would have permitted the Commission to draw an analogy to cellular service and reach a preliminary determination that market forces are the best means to encourage innovation and growth of this emerging service.

However, the Public Notice goes on to say that since VoIP services use public telephone numbers and allow subscribers to call and receive calls from any telephone in the world, in the Commission's preliminary view, these characteristics of VoIP services are sufficient to warrant treating VoIP in the same manner as conventional voice services.³¹ Despite a passing reference to the forbearance of wireless services,³² the CRTC appears to have failed to see the relevant precedent in its treatment of mobile wireless services.

We believe that VoIP has many more similarities to mobile wireless service than it does to conventional voice service. Both VoIP and mobile wireless services are able to be substitutes for conventional voice service, but both services also offer many more distinguishing characteristics, with innovation continuing to broaden

³⁰ *ibid.*

³¹ Telecom Public Notice CRTC 2004-2, Regulatory framework for voice communication services using Internet Protocol, Paragraph 22.

³² *ibid.*, Paragraph 14.

the gap. As such, although cellular service and VoIP services can replace primary exchange services, few would argue that the converse is true. At a minimum, conventional voice service does not provide the nomadic roaming of cellular or VoIP.

In the case of VoIP, the access is already competitive – most of Canada is served by high speed internet access services over DSL and cable. Currently, access is generally not bundled with consumer VoIP service; for most VoIP providers, the customer is responsible for providing their own high speed internet access connection. And even when bundled, if the access has already been found to be competitive, as is the case with high speed Internet over both phone lines (i.e. DSL) or cable, then bundling VoIP and that access service does not change the regulatory status – the bundle is also forborne.

VoIP providers do not need to rely on interconnecting agreements with the incumbent telephone companies in order to offer services. Telephone numbers can be acquired from any competing local exchange carrier as can interconnection of the networks. The number of service providers in the marketplace serves as evidence of the ease of entry by non-incumbent players. As such, the 'head-start' rules are not needed, and in any case, would be rendered moot.

Consumer Safeguards

In the Public Notice, the CRTC stated that its preliminary view was for VoIP service providers to deliver emergency calling, message relay services for the hearing impaired and safeguard consumer privacy, similar to obligations imposed

on traditional phone service providers. We briefly offer comments on each of these issues.

Emergency Services

Nearly all of the parties agreed that VoIP service providers should provide access to emergency services, as soon as technically feasible, although some suggested that no VoIP service should be offered without working emergency service.³³ Others spoke of concern for continued funding of emergency service bureaus being eroded by the migration of customers to VoIP services.³⁴

We believe that VoIP service providers will be driven by market demands to develop a satisfactory solution to accurately deliver emergency calls to the correct Public Safety Access Point. The CRTC should require its Interconnection Steering Committee (CISC) to continue its work to develop methodologies and technology solutions to apply to VoIP services.

We believe that it would be a mistake to tax telecommunications services of any kind in order to provide funding to municipal or regional emergency service bureaus. We believe that the most effective and efficient solutions will be developed when each stakeholder is responsible for its own costs, under the oversight of the CISC.

We believe that those service providers that assign Canadian phone numbers and Canadian dial plans should be required to provide emergency service access

³³ Paragraph 28, Final Reply Comments of the Consumer Groups re: CRTC PN 2004-2, October 13, 2004. See also page 4 of the Reply Comments of ARCH: A Legal Resource Centre for Persons with Disabilities, October 13, 2004.

³⁴ Paragraph 31, Reply Comments By The City of Calgary, October 13, 2004.

to the extent technically possible. There will be limitations in the quality of emergency access, in part because Canadian numbers could be assigned to VoIP users located outside Canada and in part because of technical challenges in identifying the correct location of the user and the correct PSAP to which the call should be routed.

The CRTC has dealt with this type of problem in the case of wireless services. Wireless service providers are required to provide enhanced 911 services where technically possible, provide 7x24-hour assistance to 911-operators and to provide their customers with periodic information updates as to the nature of the emergency service access capabilities that are available. Just as the CRTC determined for wireless service providers, overall public safety will be enhanced as users become aware of the different nature of emergency services to be provided by different technologies.³⁵ We believe that such a regimen is appropriate for VoIP.

Message Relay Service

Message Relay Service (MRS) provide a means for hearing impaired users to communicate with voice telephone users through an operator-relay of typed messages with the hearing impaired user to a voice user on the other end of the call. MRS provides a human operator to act as an intermediary between a hearing impaired user of a special keyboard and a hearing-capable person. The operator translates each end of the dialog in a cumbersome manner. The issue that arises with VoIP is whether the specialized terminal device (TDD) for MRS is compatible with the VoIP network.

³⁵ Paragraph 91, Telecom Decision CRTC 2003-53, Conditions of service for wireless competitive local exchange carriers and for emergency services offered by wireless service providers.

It is important to view hearing-impaired accessibility to VoIP services in perspective. VoIP is a service that will almost always be provided to subscribers with a high speed internet access line, which means that there will most likely also be at least one personal computer in close proximity. The TDD was invented in 1964 and its communications speed (45b) has remained unchanged since then (approximately 1,000 times slower than dial-up access, or 20-40,000 times slower than an average high-speed connection). Modern computer technology has evolved to provide vastly superior accessibility tools. TDD service pre-dates the widespread adoption of electronic mail and instant messaging. Personal computers, together with speech synthesis and voice recognition software, have become widespread tools that permit alternatives to the TDD as superior means of communications for the hearing impaired. The human operator sitting in the middle of the MRS transaction is redundant if one of the two parties is using a computer for one end of the call, since computer programs are available that are more effective and efficient than the 1960s MRS and TDD technologies.

We believe that it is unnecessary to require TDD compatibility, given that VoIP is associated with more modern technologies which enable a much greater portfolio of accessibility products. The CRTC should allow the marketplace to regulate the accessibility requirements.

Contribution

'Contribution' is the term given to the subsidization of residential local services in higher-cost rural and remote areas. Contribution is presently funded by means of 1.1% tax that is levied upon service providers of most types of non-internet based telecommunications services. In the Public Notice, the CRTC stated that its preliminary view was that the revenues from VoIP services are contribution-

eligible, except for peer-to-peer services, which the CRTC deemed to be a retail internet service and therefore exempt from the 1.1% contribution tax.³⁶

The general consensus was to agree with the CRTC in determining the types of services that pay into the fund, including the exemption for peer-to-peer services (such as Skype). The CRTC attempted to define such services as “all parties to the call used the same telephony application software... do not connect to the Public Switched Telephone Network (PSTN) and do not generally use telephone numbers that conform with the North American Numbering Plan.” Outside of instant messaging, such distinctions do not exist in the real world. The CRTC will need to be clear about the point at which a peer-to-peer service becomes contribution eligible. For example, do all three ‘tests’ need to be met in order to qualify for an exemption? With the advent of Skype-out, would Skype still qualify as a peer-to-peer provider? If a VoIP provider added peer-to-peer software to their terminal device, would it become a peer-to-peer provider? The removal of a monitor, keyboard and mouse do not change the basic fact that a VoIP terminal adapter is a specific personal computer software application in a solid state package.

As such, we assert that all VoIP services, where the conversion is performed at the customer premises, is a software application and should be exempt from paying contribution.³⁷ Although the CRTC is unlikely to follow such a path,³⁸ any other finding will leave open opportunities for regulatory gaming as service

³⁶ Regulatory framework for voice communication services using Internet Protocol, Telecom Public Notice CRTC 2004-2, Paragraph 29.

³⁷ This perspective agrees with the status quo definition for treatment of retail internet services under Contribution guidelines established in Order CRTC 2001-220.

³⁸ In its interrogatories (generally CRTC interrogatory number 6 or 7) posed to parties on July 16, 2004, the Commission appears to have elicited general support for VoIP services to pay into the Contribution pool.

providers segregate software application revenues (such as messaging and features), from contribution attracting VoIP revenues. End users will lose out because service providers may be forced into unbundling portions of their service which can be carved out from the contribution regime. For example, since email is clearly an internet service that does not attract contribution, some VoIP service providers may argue that voice mail delivered through the internet, perhaps as an email attachment, is also be contribution exempt. The dial-tone part of VoIP is only one small piece of the potential for the service.

The correct finding will be for the CRTC to continue to find that customer premises VoIP is a software application, whether generated by a PC or by a terminal adaptor, whether it is peer-to-peer or interconnected and as such, VoIP will continue to be exempt from paying contribution, to the extent that the conversion from voice to IP is performed at the customer premises. The CRTC has ruled on this definition a number of times³⁹ and each time it reached the correct conclusion, for a variety of reasons. We believe that its status-quo definition continues to be valid.

We believe that the correct finding should have contribution applied based on the nature of the access service. There are existing bundling rules for contribution eligible services that will correctly account for bundled voice and access services.

With respect to receiving funds from the Contribution pool, it is important to return to first principles. Contribution is designed to assist in the affordability of

³⁹ See Order CRTC 2001-220, Attachment A, definition of Retail Internet Service; Telecom Order CRTC 98-929, paragraphs 11 and 12; Telecom Order CRTC 98-28, paragraph 10; and, Telecom Order CRTC 97-590, paragraphs 80-82.

high-cost services in rural and remote areas. VoIP costs are geographically neutral; the costs are generally the same to provide in all regions. We believe that it would be a mistake to attach receiving contribution to the delivery of VoIP services, because of the inherent geographic portability of the service. Further, VoIP that is constrained geographically should not be provided with an artificial subsidy. The difference in the cost of providing services in high-cost serving areas is in the cost of access. Therefore, receiving contribution should be limited to providers of access (whether owned or leased) in qualified rural and remote regions.

Summary

The year 2005 will see voice telephone service based on internet protocol (known as VoIP - for Voice over IP) move into the mainstream in Canada and around the world. For a number of years, business phone systems have been migrating to integrate voice services with IP. Since January 2004, residential consumers in Canada have had choices to cut free from the traditional phone companies from more than a dozen IP-based service providers, all of them pushing the envelope before the CRTC has issued its decision. VoIP has enabled competition for residential dial tone in a manner that conventional technologies could not. It has liberated competitive service providers from the constraints associated with having to rely on access from their greatest foes – the incumbent carriers.

There should be no a priori urge to impose regulation on the phone companies just because they are big. In short, VoIP has provided consumers with more choices: pricing, service capabilities, packaging. Regulators must encourage all VoIP service providers, large and small, incumbent and new-entrant, domestic and foreign, to be competitive, to innovate, to be creative and bring the benefits of next generation services to as many as Canadians as possible.

Regulation should be limited to the most fundamental consumer safeguards and ensuring that all market participants have fair and equitable access to bottleneck facilities. Because the service provider has no market power, as long as the voice application is unbundled from the access facilities, there is no need to regulate the VoIP service. Conversely, if the application is bundled with an access service

that is not competitive, the Commission's existing bundling rules will come into effect.

Wireless services and VoIP are the leading trends in telecommunications around the world. The CRTC had it right when it found that "the benefits which users may derive from this innovative service are likely to be greater if the terms of its provision are governed, as much as possible, by market forces rather than by regulation."⁴⁰ It used these words more than 20 years ago in respect of wireless services. It should reach the same conclusions today in respect of VoIP.

⁴⁰ Telecom Public Notice CRTC 1984-55, Cellular Radio Service.

Credentials:

Mark H. Goldberg & Associates Inc. is a telecommunications industry consulting practice that specializes in assisting its clients to understand the implications of changes in competitive markets. Drawing on nearly 25 years of global industry experience, for more than 8 years the firm has assisted clients in Canada and around the world in all sectors of the industry: new entrants and incumbents, end users, manufacturers and software suppliers, government regulators and industry associations.

Mark Goldberg is the president of Mark H. Goldberg & Associates Inc. He has been involved in the planning, engineering, operation and management of national and global telecommunications networks, for both incumbents and new entrants. He also the founder of GST Conferences Inc., the producer of telecommunications industry conferences, including the annual Canadian Telecom Summit, Canada's largest telecom industry event. GST Conferences also produces and delivers industry training courses covering marketing, technology, regulatory, legal and social policy issues affecting telecommunications.

In the course of his corporate career, he served as Vice President Network Services for Sprint Canada, where he was responsible for the planning, engineering, administration and operations of its national network. He held similar responsibilities for TelRoute Communications Inc. As such, he has direct experience in the construction and operation of advanced, competitive telecommunications networks in Canada.

Prior to these positions, he created the discipline of Regulatory Technology at Unitel Communications (a predecessor to Allstream). In this role, he was

responsible for the development of telecommunications network interconnection architectures for the introduction of telecommunications competition in Canada. He has testified on competitive network architectures before the CRTC in proceedings that led to its landmark decisions related to long distance and local competition. He also prepared cross-examination and participated the CRTC reviews of capital spending programs by the incumbent carriers, including TELUS and its predecessor companies.

His background includes serving as Western Regional Manager, based in Denver, Colorado, for Bell Northern Research (BNR), the research and development arm of Nortel Networks, acting as a liaison with the research activities for US West (now Qwest). Prior to this, He was with AT&T Bell Laboratories, based in Holmdel, New Jersey, responsible for AT&T's voice services proposal for the United States federal government communications system, known as FTS-2000. His career began with Bell Canada's regional network administration and engineering organizations, based in South-Western Ontario.

He has lectured in the Department of Statistics and Actuarial Sciences at the University of Western Ontario and continues to lecture in the Executive Development Programme and Masters in Engineering programme at the University of Toronto. He is a graduate of the University of Western Ontario (BSc - 1979) and he holds a graduate degree in Mathematical Statistics from Carleton University (MSc - 1980). He is a member of the Advisory Board for the Masters of Engineering in Telecommunications programme at the University of Toronto.

He is often quoted in such newspapers as the National Post and Globe and Mail and he is a regular commentator on telecom issues for Canada's Report On Business TV (ROB-TV).