



## Telecom Decision CRTC 2007-44

Ottawa, 15 June 2007

### **Routing of fixed/non-native and nomadic VoIP 9-1-1 calls to public safety answering points**

Reference: 8663-B56-200610312

*In this Decision, the Commission determines that it is inappropriate for voice over Internet Protocol (VoIP) service providers to deliver 9-1-1 calls from their fixed/non-native and nomadic VoIP customers to public safety answering points (PSAPs) using low-priority telephone lines or restricted numbers. The Commission considers that zero-dialed emergency call routing service (0-ECRS) is the only available 9-1-1 call routing method on the record that is functionally comparable to basic 9-1-1 service.*

*The Commission directs all Canadian carriers offering local VoIP service to use 0-ECRS as the interim solution to route fixed/non-native or nomadic VoIP 9-1-1 calls to the PSAPs, pending the development and implementation of a long-term fixed/non-native and nomadic VoIP enhanced 9-1-1 solution. The carriers are to implement this interim solution within 30 days of the date of this Decision.*

*The Commission also directs Canadian carriers, as a condition of providing telecommunications services to VoIP service providers, to include in their service contracts or other arrangements with these service providers the requirement that the latter comply with the Commission's determinations in this Decision.*

### **Introduction**

1. The Commission received an application by a group of organizations identifying themselves as public safety answering points (PSAPs) or 9-1-1 system administrators (collectively, the PSAPs),<sup>1</sup> dated 17 August 2006, pursuant to Part VII of the *CRTC Telecommunications Rules of Procedure*, regarding voice over Internet Protocol (VoIP) 9-1-1 call routing arrangements.
2. The PSAPs submitted that they had become aware that fixed/non-native<sup>2</sup> and nomadic<sup>3</sup> VoIP service providers were delivering a majority of 9-1-1 emergency calls to the PSAPs over low-priority lines – such as administrative lines, lines used to handle lower priority alarm system and non-emergency calls, and other inappropriate lines. The PSAPs noted that these calls did not use existing 9-1-1 networks. They submitted that such VoIP service providers, or

<sup>1</sup> These organizations, which receive 9-1-1 calls from members of the public and dispatch emergency assistance, include the British Columbia 9-1-1 Service Providers Association, Alberta E9-1-1 Advisory Association, City of Brandon Protective Services, Winnipeg Police Service, Ontario 9-1-1 Advisory Board, Association des centres d'urgence du Québec, NB 9-1-1 Service Department of Public Safety, Nova Scotia E911 Cost Recovery Committee, and the 911 Administration Office Province of Prince Edward Island.

<sup>2</sup> With a local VoIP service offered on a non-native basis, a VoIP customer is assigned an area code that is not native to any of the local exchanges within that customer's serving area.

<sup>3</sup> With a local VoIP service offered on a nomadic basis, a VoIP customer does not necessarily make calls from a fixed address.

their third-party operator service providers (TPOs), did not appear to be using the VoIP 9-1-1 call routing arrangements developed by the Emergency Services Working Group (ESWG) of the CRTC Interconnection Steering Committee (CISC) and approved by the Commission.

3. The PSAPs noted that the approved arrangements were set out in the incumbent local exchange carriers' (ILECs) zero-dialed emergency call routing service (0-ECRS) and other VoIP call routing tariffs.<sup>4</sup> They suggested that delivering calls to the PSAPs over inappropriate lines created a safety risk for the public and was disruptive to the PSAPs' operations.
4. The PSAPs requested that the Commission issue a reminder to all VoIP service providers that the only VoIP 9-1-1 call routing arrangements currently consistent with the Commission's determinations in *Emergency service obligations for local VoIP service providers*, Telecom Decision CRTC 2005-21, 4 April 2005 (Decision 2005-21), were those developed by the CISC ESWG and set out in the ILECs' tariffs.
5. The PSAPs also requested that the Commission require all Canadian carriers, as a condition of providing telecommunications services to local VoIP service providers, to include in their service contracts or other arrangements with these service providers the requirement that the latter could only use VoIP 9-1-1 call routing arrangements that had been developed in the CISC ESWG and that had Commission-approved tariffs, or alternative call routing arrangements that had been approved by the Commission for this purpose.
6. The Commission received comments from Bell Aliant Regional Communications, Limited Partnership and Bell Canada (the Companies), the Canadian Association of Voice Over IP Providers (CAVP), the Canadian Cable Systems Alliance (CCSA), Comwave Telecommunications Inc. (Comwave), Primus Telecommunications Canada Inc. (Primus), Saskatchewan Telecommunications (SaskTel), Télécommunications Xittel inc. (Xittel), and Vonage Canada Corp. (Vonage). The record of this proceeding closed on 27 September 2006 with the PSAPs' reply comments.
7. The Commission must determine the appropriate interim solution to route fixed/non-native or nomadic VoIP 9-1-1 calls to the PSAPs, pending the development and implementation of a long-term fixed/non-native and nomadic VoIP enhanced 9-1-1 solution. In order to do so, the Commission will first set out background information regarding VoIP 9-1-1 call routing. It will then examine the call routing options raised during the course of this proceeding, which were: i) low-priority lines or restricted telephone numbers, and ii) the ILECs' 0-ECRS.

## **Background**

8. In Decision 2005-21, the Commission noted that no party to the proceeding that led to that Decision had described a comprehensive solution, practical for implementation in Canada at that time, that would ensure proper routing of 9-1-1 calls to the PSAPs when calls were placed using fixed/non-native or nomadic local VoIP services.

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<sup>4</sup> The Commission notes that the reference to 0-ECRS service in this Decision also includes TELUS Communications Company's (TCC) Emergency Services – Operator Access Coordination Service and Bell Canada's Voice over IP 9-1-1 Call Routing Service.

9. In the absence of a comprehensive solution, the Commission directed VoIP service providers supporting fixed/non-native or nomadic local VoIP services to implement, within 90 days of the date of Decision 2005-21, an interim solution for routing fixed/non-native or nomadic VoIP 9-1-1 calls to PSAPs. The Commission specified that the interim solution should provide a level of functionality comparable to basic 9-1-1 service<sup>5</sup> and ensure that a 9-1-1 call originating from a local VoIP service would be routed to a PSAP that served the geographical location from which the call was placed.
10. In Decision 2005-21, the Commission considered that an interim fixed/non-native or nomadic 9-1-1 VoIP call routing solution that used an intermediary – whose sole responsibility was to obtain the caller's geographical location and transfer the call to the PSAP providing the appropriate service in that location – functioned in a manner similar to basic 9-1-1 service. The Commission indicated that the intermediary could be the VoIP service provider's internal call centre or TPO.
11. In Decision 2005-21, the Commission requested that the CISC ESWG identify the technical and operational issues that impeded 9-1-1 and enhanced 9-1-1 (E9-1-1) service delivery when local VoIP service was offered, identify all viable solutions, and recommend the preferred solution(s).
12. As a result of extensive discussions, members of the CISC ESWG recommended that ILECs provide access to their existing 0-ECRS to VoIP service providers and their TPOs. The ESWG deemed the ILECs' 0-ECRS to be an appropriate interim solution because it enabled a VoIP service provider's internal call centre or a TPO to route VoIP 9-1-1 calls from fixed/non-native or nomadic customers to the proper emergency services agency anywhere in the country using the current 9-1-1 network.
13. Following the CISC recommendations, all major ILECs filed 0-ECRS tariffs that enable VoIP service providers and TPOs to route 9-1-1 calls to the appropriate PSAP in the ILECs' territories, and the Commission has since approved these tariffs.

## **Call routing using low-priority lines or restricted telephone numbers**

### **Positions of parties**

14. The PSAPs submitted that during CISC discussions to develop an interim solution for delivering 9-1-1 calls from fixed/non-native and nomadic VoIP service customers, the PSAPs had rejected proposals to route 9-1-1 calls using low-priority lines. They also noted that low-priority lines were not staffed 24 hours per day or seven days per week and were not equipped to support 9-1-1 automated call transfer to police, fire, or ambulance services. The PSAPs submitted, further, that the procedures for answering administrative and alarm company lines were different from those for responding to calls coming in on 9-1-1 lines.

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<sup>5</sup> Basic 9-1-1 service connects the caller to a central call centre, which then connects the call to the correct emergency response centre, at which point the caller must identify his or her location in order for an emergency response service to be dispatched.

15. The PSAPs expressed concern that as fixed/non-native and nomadic VoIP 9-1-1 call volumes grew, routing those calls to low-priority lines would have an increasingly disruptive effect on the PSAPs' systems and procedures, which would jeopardize public safety and security.
16. CAVP, Comwave, and Primus submitted that the PSAPs had created the routing problem by refusing to provide VoIP service providers with access to the PSAPs via direct dial telephone numbers. CAVP and Comwave requested that the Commission issue a reminder to the PSAPs that they could easily remedy this problem by releasing their direct dial telephone numbers.
17. CAVP, Comwave, Primus, and Vonage also argued that in Decision 2005-21, the Commission had noted that one of the shortcomings of the interim solution was that not all the PSAPs provided an administration number for use by third-party call centres, requiring instead that these call centres use alternative arrangements to transfer calls to emergency services personnel. They noted that the Commission had considered that calls handled this way might not receive the same priority as normal 9-1-1 calls.
18. Comwave submitted that in Decision 2005-21 the Commission had intended to give VoIP service providers some flexibility regarding the way they provided 9-1-1 services for fixed/non-native and nomadic VoIP services. Comwave considered that this flexibility was necessary due to the technological and operational constraints of this technology.

#### **Reply comments**

19. The PSAPs disagreed that the Commission's VoIP 9-1-1 decisions provided the flexibility to route calls to the PSAPs over administrative and other low-priority lines, and that the Commission had encouraged the PSAPs to disclose to VoIP service providers direct dial numbers for routing fixed/non-native or nomadic VoIP 9-1-1 calls.
20. The PSAPs explained that when an end-user dialed 9-1-1, the ILEC's switch converted these digits into direct dial telephone numbers. They noted that these direct dial numbers were then used to establish a link between the PSAP and the ILEC's switch. They also noted that these direct dial numbers were, therefore, restricted numbers that were used only as part of network translations.
21. The PSAPs argued that the request to provide restricted numbers had no merit. In the PSAPs' view, providing access to the PSAPs using restricted numbers would bypass the 9-1-1 network, which would jeopardize network security and integrity, the PSAP operations, and, ultimately, public safety for VoIP, wireline, and wireless 9-1-1 callers.
22. The PSAPs submitted that they had never released these restricted numbers beyond their own systems. They noted, however, that these restricted numbers were regular 10-digit telephone numbers and, as such, could be dialed by anyone from the public switched telephone network (PSTN) to call into the PSAPs.
23. The PSAPs noted that 9-1-1 systems were equipped with safeguards and safety mechanisms that would be unavailable if the PSAPs' restricted numbers were used to bypass the 9-1-1 network. The PSAPs also noted that bypassing these safety mechanisms would result in missed and unanswered 9-1-1 calls.

### **Commission's analysis and determinations**

24. The Commission notes that in Decision 2005-21 it observed that one of the shortcomings of the interim solution was that "not all PSAPs provide a 10-digit administration number for use by third-party call centres, requiring these call centres to use alternative arrangements to transfer calls to emergency services personnel." The Commission also observed that calls handled in this way might not be given the same priority as normal 9-1-1 calls.
25. The Commission considers that one cannot conclude, as suggested by some VoIP service providers, that by noting the shortcomings of low-priority lines in Decision 2005-21, the Commission had mandated or requested the PSAPs to provide numbers for low-priority lines. The Commission considers that by noting the shortcomings, it merely intended to ensure that VoIP service providers first obtained the PSAPs' consent to use low-priority lines for delivering fixed/non-native or nomadic VoIP 9-1-1 calls.
26. The Commission considers that if a PSAP agreed to provide this consent, the PSAP would also make the necessary arrangements to ensure that calls routed to such lines would no longer be considered low-priority calls. However, the Commission also considers that Decision 2005-21 required that if VoIP service providers failed to get consent from the PSAPs, they would have to use alternative arrangements to transfer calls to the PSAPs.
27. The Commission notes that when Decision 2005-21 was issued, no method had been adopted for VoIP service providers to deliver fixed/non-native or nomadic VoIP 9-1-1 calls to the PSAPs. As a result, VoIP service providers have been delivering these VoIP 9-1-1 calls to the PSAPs over low-priority lines without the PSAPs' knowledge and consent.
28. The Commission notes that low-priority lines are not staffed 24 hours per day or seven days per week, which could result in 9-1-1 emergency calls being left unanswered. The Commission also notes that these lines are not equipped to support 9-1-1 call transfer capabilities and, as a result, automated transfer of a call to emergency services is not available. Further, the Commission notes that call takers answering administrative and alarm company lines follow different and less stringent procedures than those answering calls on 9-1-1 lines.
29. Therefore, the Commission considers it likely that continued use of low-priority lines to deliver 9-1-1 calls to the PSAPs would result in a 9-1-1 call being put on hold, left unanswered, or delayed in the dispatch to the appropriate emergency services. The Commission considers that such a situation raises serious public safety concerns.
30. The Commission notes that VoIP service providers did not dispute the risks to public safety that low-priority lines create. However, some VoIP service providers argued that this situation could be remedied if, as an alternative, the PSAPs would provide them with the restricted numbers used by the ILEC's switch to transmit 9-1-1 calls to the PSAPs.
31. The Commission notes that the restricted numbers are traditional 10-digit numbers that anyone may dial from the PSTN to access the PSAPs, bypassing the 9-1-1 network. The Commission considers that if the restricted numbers were to fall into unscrupulous hands, PSAPs could be vulnerable to attacks that could severely disrupt the operations of a PSAP and could even block legitimate 9-1-1 calls.

32. The Commission considers that during such an event, a PSAP would not be able to trace the origin of the caller(s) in order to halt such an attack since the restricted numbers bypass the 9-1-1 network. Furthermore, bypassing the 9-1-1 network means bypassing the safety mechanism<sup>6</sup> that maintains the PSAPs' operations during high call volumes or major emergency events.
33. The Commission notes that even if the PSAPs were to provide the restricted numbers, they would be unable to provide updated call routing information when a municipal amalgamation, a change in a PSAP, or any other network routing change took place.
34. As a result, the Commission considers that the restricted numbers should continue to be used only within a PSAP's own systems.
35. The Commission concludes that delivering 9-1-1 calls to a PSAP over low-priority lines or using restricted numbers would harm PSAP network security and integrity, and could severely disrupt the PSAP's operations. Any such disruption would ultimately jeopardize public safety for all 9-1-1 service users, whether they subscribe to VoIP, wireline, or wireless telephone services.
36. In the Commission's view, delivering fixed/non-native or nomadic VoIP 9-1-1 calls using low-priority lines and restricted numbers is not functionally equivalent to the basic 9-1-1 service requirements mandated by the Commission in Decision 2005-21.
37. Accordingly, the Commission determines that it is inappropriate for fixed/non-native or nomadic VoIP service providers to deliver 9-1-1 calls to the PSAPs using low-priority lines or using restricted numbers as an interim solution for providing 9-1-1 service to their subscribers.

### **Call routing using 0-ECRS**

#### **Positions of parties**

38. The PSAPs submitted that the only 9-1-1 call routing arrangement approved by the Commission to implement the mandated interim solution in Decision 2005-21 was the ILECs' 0-ECRS. They also submitted that 0-ECRS provided a means for them to receive fixed/non-native or nomadic VoIP 9-1-1 calls in the same manner, and to treat them with the same priority, as a wireline basic 9-1-1 call. However, they expressed concern that the majority of fixed/non-native and nomadic VoIP service providers still did not appear to be using the service.
39. The Companies, Primus, and Vonage submitted that as VoIP service providers, pursuant to Decision 2005-21, they had implemented 0-ECRS as an interim solution to provide 9-1-1 with their nomadic local VoIP services while awaiting the development of a long-term solution.

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<sup>6</sup> That is, the safety mechanism that enables the PSAPs to switch 9-1-1 calls from 9-1-1 primary lines to 9-1-1 secondary lines or to an off-site location.

40. However, CAVP, the CCSA, Comwave, Primus, Vonage, and Xittel submitted that 0-ECRS was not the only arrangement consistent with Decision 2005-21. They were of the view that the public interest would be best served if the Commission permitted VoIP service providers to develop and use alternative call routing arrangements, in addition to 0-ECRS, to comply with the requirements of Decision 2005-21.
41. Some of the VoIP service providers expressed concern that they would have to incur additional costs to implement 0-ECRS.
42. In addition, some of the VoIP service providers submitted that TCC's 0-ECRS continued to require an additional operator to route calls to the appropriate PSAP. They argued that the additional operator increased the time to connect a 9-1-1 call to a PSAP and that this was a safety risk.
43. The CCSA noted that many small cable operators marketed and provided VoIP services in limited geographical areas that corresponded to their serving territories. The CCSA claimed that in these circumstances, using the ILECs' 0-ECRS tariffs would be less efficient and more costly than arrangements to route calls to the individual PSAP serving the cable operator's territory.

#### **Commission's analysis and determinations**

44. The Commission notes that CAVP, the CCSA, Comwave, Primus, Vonage, and Xittel disagreed with the PSAPs' submission that 0-ECRS was the only solution that met the Commission's requirements for VoIP 9-1-1 call routing arrangements. However, the Commission notes that the only alternatives to 0-ECRS submitted on the record of this proceeding were low-priority lines or restricted numbers, which the Commission has determined are not appropriate for routing fixed/non-native and nomadic VoIP 9-1-1 calls.
45. The Commission notes that after Decision 2005-21 was issued, the industry worked in CISC to develop an interim solution for routing 9-1-1 calls from fixed/non-native and nomadic VoIP service customers to PSAPs within the timeline set by the Commission. The Commission also notes that CISC ESWG members recommended that all ILECs providing 9-1-1 service should make 0-ECRS available to VoIP service providers and their TPOs. The Commission further notes that subsequent to the CISC recommendation, all major ILECs filed tariffs for 0-ECRS and these tariffs have since been approved by the Commission.
46. The Commission notes that ILECs are the only entities that can provide telecommunications service providers with network connections to all the PSAPs in their serving territories. The only way VoIP service providers or TPOs can use the ILECs' network connections to access the PSAPs is by subscribing to 0-ECRS. Therefore, the Commission considers that 0-ECRS is the only emergency call routing solution on record that ensures that VoIP service providers or TPOs can obtain direct access to the appropriate PSAP anywhere in the country.
47. The Commission notes that, as submitted in this proceeding, there is at least one TPO that currently provides a service using the various ILECs' 0-ECRS to provide VoIP service providers with access to the PSAPs nationally.

48. In the Commission's view, 0-ECRS ensures that 9-1-1 calls from VoIP service providers are routed to the PSAPs over the existing 9-1-1 network, are processed through the existing systems and infrastructure of the PSAPs, and are transferred to the appropriate emergency services using the existing provincial 9-1-1 platform. The Commission notes that these 9-1-1 network facilities have been designed to be redundant, which allows calls to be rerouted in the case of network outages or troubles.
49. The Commission also notes that using 0-ECRS allows the PSAPs to follow standardized procedures to determine the nature of the emergency and to dispatch the appropriate emergency service(s).
50. The Commission considers all of the above to be critical to ensure that all VoIP service providers' 9-1-1 calls received by the PSAPs are processed with the same priority as 9-1-1 calls dialed by ILECs' or competitive local exchange carriers' customers.
51. In addition, the Commission considers that Telephone Operator Position Record lists, which the ILECs provide as part of 0-ECRS, supply valuable contact information to VoIP service providers for areas not served by a provincial 9-1-1 system.
52. The Commission notes that 0-ECRS has been available to VoIP service providers and their TPOs for several months, providing sufficient time for them to adapt their systems and procedures to make use of this service. The Commission also notes that the Companies, Primus, and Vonage indicated that they or their TPOs were using 0-ECRS to connect to the PSAPs.
53. Regarding the VoIP service providers' concern that they would have to incur additional costs to implement delivery of fixed/non-native or nomadic VoIP 9-1-1 calls to the PSAPs using 0-ECRS, the Commission notes that it has approved the 0-ECRS tariffs filed by the ILECs, which ensures that the rate charged for the service is just and reasonable. The Commission notes that there is no evidence on the record of this proceeding to establish what, if any, the additional expenses would be over the tariffed rates.
54. In addition, the Commission considers that any extra cost would be mitigated by the fact that most VoIP service providers use a TPO to deliver their 9-1-1 calls to the PSAPs. Since a TPO is only required to subscribe to 0-ECRS once in each ILEC territory but can provide 9-1-1 delivery service to many VoIP service providers, the cost for the TPO to provide the 9-1-1 access service to a number of VoIP service providers is greatly reduced. The Commission considers that economies of scale should keep the TPO's operational cost of using 0-ECRS affordable.
55. Therefore, the Commission considers that the VoIP service providers have failed to demonstrate that if additional expenses were indeed incurred as a result of using the ILEC's 0-ECRS to deliver fixed/non-native or nomadic VoIP 9-1-1 calls to the PSAPs, the additional cost would be unreasonable given the importance of having a suitable solution.
56. The Commission notes the concern raised regarding 0-ECRS delays in TCC's territory due to operators, rather than an automated system, routing calls to PSAPs. The Commission considers that since VoIP service providers or their TPOs are required to have the 9-1-1 caller's location



before using 0-ECRS to direct the call to the appropriate PSAP, TCC's 0-ECRS does not add a significant delay or public safety concern. In the Commission's view, before transferring a call to the appropriate PSAP, the TPO is only required to provide TCC's 0-ECRS operator with the caller's city name. The Commission considers that the strong support for 0-ECRS by PSAPs demonstrates that PSAPs are not concerned that this delay would jeopardize the safety of 9-1-1 callers.

57. The Commission considers that 0-ECRS is the only 9-1-1 call routing method on the record that is functionally comparable to basic 9-1-1 service since 0-ECRS ensures that PSAPs give all fixed/non-native or nomadic VoIP 9-1-1 calls the same priority and use the same procedures as all other 9-1-1 calls.
58. The Commission also considers that until a long-term fixed/non-native and nomadic VoIP E9-1-1 solution is implemented, the interim solution should at least meet the Commission's directives in Decision 2005-21.
59. The Commission notes the PSAPs' request for a call routing condition in service contracts and other arrangements between Canadian carriers and local VoIP service providers. The Commission considers that, consistent with its directions in Decision 2005-21, it would be appropriate to direct all Canadian carriers, as a condition of providing telecommunications services to local VoIP service providers, to include in their service contracts or other arrangements with these service providers the requirement that the latter must comply with the directions set out in this Decision.

## **Conclusion**

60. In light of the above, the Commission directs all Canadian carriers offering local VoIP service to use 0-ECRS as the interim solution to route fixed/non-native and nomadic VoIP 9-1-1 calls to the PSAPs, pending the development and implementation of a long-term fixed/non-native and nomadic VoIP E9-1-1 solution. The carriers are to implement this interim solution within 30 days of the date of this Decision.
61. The Commission also directs Canadian carriers, as a condition of providing telecommunications services to VoIP service providers, to include in their service contracts or other arrangements with these service providers the requirement that the latter must comply with the Commission's determinations in this Decision. All existing service contracts and other arrangements are to be amended accordingly, within 30 days of the date of this Decision.

Secretary General

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