Canadian Radio-television and Telecommunications Commission
Conseil de la radiodiffusion et des télécommunications canadiennes

Telecom Decision CRTC 2019-330

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CISC Emergency Services Working Group – Non-consensus report ESRE0074 on how to best manage multi-line telephone systems in a Canadian Enhanced 9-1-1 environment

*The Commission requests that the CRTC Interconnection Steering Committee (CISC) Emergency Services Working Group (ESWG) submit to it a report, within **8 months** of the date of this decision, outlining any lessons or recommendations that can be applied to multi-line telephone systems (MLTS) 9-1-1 calling in Canada based on a revised assessment of changes in the MLTS environment. The Commission also expects MLTS providers and other stakeholders to implement the best practices recommended by the ESWG.*

Background

1. Canadians currently have access to either Basic 9-1-1 (B9-1-1) service or Enhanced 9-1-1 (E9-1-1) service through traditional wireline, wireless, and local voice over Internet Protocol (VoIP) telephony services wherever a 9-1-1 call centre, also known as a public safety answering point (PSAP), has been established.[1]

2. Multi-line telephone systems (MLTS) are telephone central exchange systems, such as Centrex and private branch exchange (PBX), that service private and public organizations and provide intercommunication between a large number of telephone stations within the organization. These systems are frequently used by entities such as government agencies, banks, hotels, hospitals, and schools that require access to telephone lines for a large number of users. They can be either network-based (hosted) or premises-based, using either analogue or digital Internet Protocol (IP) technology. Most MLTS require a caller to dial an additional digit, access code, or prefix (e.g. dialing 8 before dialing the telephone number) to obtain an outside line when dialing an external telephone number, including 9-1-1. While almost all MLTS are capable of sending specific 9-1-1 call information, including the caller's telephone number and location, most do not.

[1] B9-1-1 service enables callers to be connected to PSAP 9-1-1 communicators, who dispatch the appropriate emergency responders. E9-1-1 service includes B9-1-1 service but also automatically provides PSAP 9-1-1 communicators with ancillary information, such as the telephone number and location of the caller.

3. PSAPs are increasingly facing issues with 9-1-1 calls originating from MLTS as technology evolves to IP-based communications. More MLTS-originated 9-1-1 calls are being processed by MLTS as nomadic VoIP calls,[2] since the calls are being carried over the Internet and not over the public switched telephone network.

4. The CRTC Interconnection Steering Committee (CISC) Emergency Services Working Group (ESWG), which includes telecommunications service providers (TSPs), PSAPs, and 9-1-1 industry specialists, addresses issues related to the provisioning of 9-1-1 services. The ESWG addresses these issues, including the technical and operational implementation of 9-1-1 services, upon request by the Commission or by stakeholders. Given the various concerns raised by 9-1-1 stakeholders with MLTS-originated 9-1-1 calls, the ESWG developed a report on the current associated challenges and projected issues with 9-1-1 dialing, access, routing, and location identification.

The Report

5. On 26 May 2017, the ESWG submitted to the Commission the following non-consensus report (the Report):

    - *Proposals to Best Manage Multi-Line Telephone Systems (MLTS) in a Canadian Enhanced 9-1-1 (E9-1-1) Environment*, 26 May 2017 (ESRE0074)

6. The Report can be found under the "Reports" section of the ESWG page, which is available under the CISC section of the Commission's website at www.crtc.gc.ca.
7. In the Report, the ESWG sought Commission review of a number of consensus and non-consensus recommendations related to MLTS in a Canadian E9-1-1 environment.
8. The Report is based on the acknowledgement that while the Commission has regulatory authority over the 9-1-1 network providers and TSPs, it does not have such authority over MLTS providers or MLTS owner-operators. However, the ESWG was of the opinion that the Commission can nevertheless exercise important industry influence.
9. Specifically, in the Report, the ESWG identified consensus and non-consensus recommendations for 9-1-1 network providers and TSPs, and best practices for MLTS providers. The ESWG addressed the following three main issues:

    - MLTS direct dialing to access 9-1-1 (i.e. the ability to dial 9-1-1 directly without the need to dial an access code or a prefix first);
    - emergency call routing functions; and
    - Automatic Location Identification (ALI) display capabilities.

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[2] Nomadic VoIP calls are IP-based calls for which the location of the caller is not associated with the telephone number.

10. The Report also included a sample of a letter that could be sent to MLTS owner-operators that identifies steps for them to review processes for 9-1-1 emergency calling through MLTS. The ESWG proposed that the Commission, or another federal authority, send this letter to improve the integrity of 9-1-1 services within the MLTS environment.

Commission's analysis and determinations

11. The Commission considers that five of the consensus recommendations in the Report involve 9-1-1 operational processes that are generally already in place with incumbent local exchange carriers (ILECs) and TSPs. These recommendations are listed in Appendix 1 to this decision. The Commission agrees that the maintenance of those processes will continue to contribute to the effective delivery of 9-1-1 services and to the safety of Canadians.

12. The Commission considers that another six of the ESWG's recommendations (two consensus and four non-consensus) are outside the scope of the ESWG's mandate, since they pertain to matters beyond the technical and operational implementation of 9-1-1 services. These recommendations are listed in Appendix 2 to this decision.

13. For the remainder of the recommendations, the Commission considers that further process is required to ensure that the associated issues are properly examined. For example, the ESWG made a recommendation applicable to TSPs, "… that direct dialing to 9-1-1 from any MLTS be implemented as part of the provisioning of the service, where technically feasible, by virtue of the underlying local exchange carrier's 9-1-1 service obligations." This recommendation lacks the clarity required to ensure that TSPs understand exactly what is required of them and cannot be enforced by the Commission.

14. As acknowledged in the Report, the Commission does not have direct authority over MLTS providers or MLTS owner-operators. However, regarding the ESWG's request for the Commission to consider the recommended best practices applicable to MLTS providers, as listed in Appendix 3 to this decision, the Commission agrees with the objectives of these practices, since they may facilitate the processing and delivery of MLTS 9-1-1 calls (and associated call information) in a manner that is closely aligned with how non-MLTS 9-1-1 calls are currently processed, providing a higher level of safety for Canadians.

15. Regarding the letter to MLTS owner-operators proposed by the ESWG, the national coordination of 9-1-1 stakeholders, other than providers of telecommunications services, is not within the Commission's mandate. Therefore, it would be inappropriate for the Commission to send the letter as suggested by the ESWG.

16. Given that advancements have been made in replacement services for Centrex in Canada, and the regulatory advancements affecting MLTS in other jurisdictions,[3] the Commission considers that further assessment is warranted to determine appropriate next steps to address MLTS issues in the Canadian E9-1-1 environment.

17. In light of the above, the Commission

    - requests that the ESWG submit a report (either an updated version of ESRE0074 or a new report) to the Commission, within **8 months** of the date of this decision, outlining any lessons or recommendations that can be applied to MLTS 9-1-1 calling in Canada based on a revised assessment of changes in the MLTS environment in Canada and the United States since the ESWG's initial assessment in 2017;

    - requests that, if the above-mentioned report contains a recommendation on the same topic as Recommendation 5, "… that direct dialing to 9-1-1 from any MLTS be implemented as part of the provisioning of the service, where technically feasible, by virtue of the underlying LEC's [local exchange carrier] 9-1-1 service obligations," the new recommendation be clarified such that it can be enforced by the Commission and that all affected stakeholders are aware of who is being directed to take what actions and by when;

    - expects ILECs and TSPs to continue to follow the existing 9-1-1 operational processes listed in the Report; and

    - expects MLTS providers, as well as private enterprises, governments, and government agencies that currently use MLTS, to implement the best practices recommended by the ESWG as listed in Appendix 3.

Application of the Policy Direction

18. On 17 June 2019, the Governor General in Council registered the *Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives to Promote Competition, Affordability, Consumer Interests and Innovation*, SOR/2019-227, which complements the previous Policy Direction issued in 2006.[4] The Report was filed with the Commission before the new Policy Direction

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[3] For example, the United States Federal Communications Commission (FCC) has initiated a proceeding to examine, among other things, the adoption of (i) direct dialing and notification (e.g. to a front desk or a security office) rules governing calls to 9-1-1 made from MLTS, and (ii) rules to ensure that dispatchable location (defined by the National Emergency Number Association as "the street address of the calling party, and additional information such as room number, floor number, or similar information necessary to adequately identify the location of the calling party") is conveyed with 9-1-1 calls, regardless of the technological platform used, so that 9-1-1 call centres receive the caller's location automatically and can dispatch emergency responders more quickly. There is close similarity in the MLTS environments in Canada and the United States, with many of the same vendors offering their products in both countries.

[4] *Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives*, P.C. 2006-1534, 14 December 2006

came into force; however, pursuant to paragraph 11(3)(b) of the *Telecommunications Act*, the new Policy Direction applies to this decision since more than one year elapsed between the submission of the Report and the date of the new Policy Direction. The Commission must therefore consider and specify how its determinations promote competition, affordability, consumer interests, or innovation, as applicable.

19. The mandate of CISC is to undertake tasks and provide recommendations related to technological and operational issues, not to develop or recommend policy. As such, reports submitted by CISC to the Commission for consideration do not generally directly target the promotion of competition, affordability, consumer interests, or innovation. However in the present circumstances, by expecting ILECs and TSPs to continue the existing practices they have developed related to MLTS, the Commission is promoting competition by supporting industry-led solutions within a competitive environment. Similarly, by requesting that the ESWG revise its report to reflect improvements in the MLTS environment, the Commission is promoting innovation to find new technological solutions to existing challenges, which will ultimately benefit consumers.

Secretary General

Appendix 1 to Telecom Decision CRTC 2019-330

Consensus recommendations in the Report regarding generally existing 9-1-1 operational processes[5]

Recommendations applicable to 9-1-1 network providers

1. ESWG recommends maintaining the existing Enhanced 9-1-1 (E9-1-1) Database System processes in Canada designed to support only valid 10-digit routable Telephone Numbers (TNs), and where feasible dialable TNs, associated with fixed civic addresses preloaded in ALI databases, especially when using Emergency Line Identification Numbers (ELINs).

2. ESWG recommends that 9-1-1 service providers help educate and provide support details to parties requesting access to Private Switch-Automatic Location Information (PS-ALI) solution to manage Customer Name and Address Information (CNAI) records for ALI database insertion, as it may be something unfamiliar to some Private Switch Operators (PSOs), aggregators or service providers, especially small ones.

3. ESWG recommends that existing capacity and/or processing capability (e.g., 9-1-1 Data file exchange portal(s), Database Management System(s), E9-1-1 Selective Routing Database(s) (E9-1-1SRDB), ALI computer(s), etc.) be determined by the applicable ILEC 9-1-1 Service Provider.

4. ESWG recommends that ILEC 9-1-1 SPs [service providers] provide the PSO, aggregator or service provider with access to applicable call routing and civic address display processes in order to perform end user device mapping and NPA [numbering plan area]-specific Automatic Number Identification (ANI) assignment to help determine which local Central Office (CO) to interconnect with, in order to reach the designated Public Safety Answering Points (PSAPs) (through the 9-1-1 Control Office switch), and provisioning of the end user device physical location in the applicable E9-1-1 Data System(s).

Recommendations applicable to TSPs

6. ESWG recommends that LECs, LSPs [local service providers] and applicable resellers provide services that allow PSOs or aggregators to be able to interface with their local 9-1-1 systems and comply with all 9-1-1 requirements. These services include but are not limited to:

    a. Trunking which is capable of passing the call and the Emergency Location Identification Number (ELIN) sent by the PBX/MLTS to the E9-1-1 system.

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[5] The numbering of the recommendations in this appendix is the same as that in the Report.

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Recommendations in the Report that are beyond the scope of the ESWG[6]

Consensus recommendations applicable to TSPs

6. ESWG recommends that LECs, LSPs and applicable resellers provide services that allow PSOs or aggregators to be able to interface with their local 9-1-1 systems and comply with all 9-1-1 requirements. These services include but are not limited to:

    b. The tools for the PSO to process 9-1-1 database records to the 9-1-1 Database Provider for the local E9-1-1 system.

7. ESWG recommends that liability protection be assessed and ascertained as required, obviously except for gross negligence, recklessness or intentional misconduct;

    a. If new MLTS service is a result of ESWG work, the industry can identify any extraneous liability issues in the future,

    b. If it's the result of a new tariffed service introduction, there are ample precedents to ensure appropriate language and review by industry and the Commission for approval.

Non-consensus recommendations applicable to 9-1-1 network providers

4.3.1 The 9-1-1 SP's PS-ALI Service should be designed to support any PSO or aggregator, no matter which LSP or reseller provides the Direct Inward Dialing (DID) numbers or the dial tone.

4.3.2 In a geographic area where E9-1-1 is available, all carriers should have access to those systems under equal terms and conditions in a standardized way via the system aggregator or 9-1-1 service provider. These equal access requirements should be available across all technologies and markets (e.g. IP, legacy, Enterprise, etc.) in order to provide equivalent 9-1-1 service across all subscribers from all carriers and resellers as well as E9-1-1 service and features to PSAPs which is preferable to B9-1-1.

4.3.3 Carrier agnostic access to the 9-1-1 network ensures that any carriers or service providers can offer E9-1-1 where it is technically feasible, and PS-ALI service be publicly available when requested by consumers.

4.3.4 ESWG recommends that the E9-1-1 PS-ALI service and other methods of providing precise location information to PSAPs for both legacy time-division-multiplexing-based MLTS and modern voice over Internet protocol-based MLTS be available across Canada to customers (retail or wholesale) of all TSPs and other non-TSP MLTS providers be mandated where technically feasible.

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[6] The numbering of the recommendations in this appendix is the same as that in the Report.

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Recommendations in the Report for MLTS provider and other stakeholder best practices[7]

8. That MLTS providers provision future PBX/MLTS systems, especially any system associated with residential and consumer services, to allow 3-digit 9-1-1 dialing without having to prefix any access code, i.e., without the prior need to dial any other digit to obtain dial tone for an outside line.

9. That Private Switch Operators (PSOs), aggregators and service providers assign a unique ANI for identifying the location of each device or group of collocated devices, as specified by the existing E9-1-1 network design.

10. That MLTS providers provision a minimum of two (2) Primary Rate Interface (PRI) trunks per E9-1-1 System (9-1-1 serving areas) for diversity purposes.

11. That PSOs, aggregators and service providers utilize private switch 9-1-1 call processing software that detects the emergency digits 9-1-1 and routes the emergency call to the appropriate LSP's end office for further routing to the designated E9-1-1 Control Office switch for delivery to the designated primary PSAP.

12. That MLTS providers, where possible, provision hybrid routing which: (i) provides E9-1-1 within the managed network (building, floor, campus, etc.) where the location can be asserted accurately and (ii) defaults to B9-1-1 service if the location cannot be determined or is outside of the managed network (e.g. Virtual Private Network (VPN)).

13. That MLTS providers create, support, distribute and explain to their customers common 9-1-1 specifications and safeguards covering comprehensive communications plans such as information packages, warning-related training session(s) and/or public awareness campaigns be developed, distributed and explained to help inform the public, PBX owners/operators, and emergency call takers of such E9-1-1 dialing, call routing and address location information provisioning expectations, challenges, issues and their potential impacts.

14. That private enterprises, public provincial and federal agencies and governments that are very large users of MLTS systems for their services and networks (e.g., education and health), take a leadership role in terms of adopting MLTS owner/operator best practices.

15. That MLTS providers verify their active private switch 9-1-1 call processing software can deliver and display the PS-ALI CNAI record to the local primary PSAP including display of additional information field content.

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[7] The numbering of the recommendations in this appendix is the same as that in the Report.

16. That MLTS providers/operators install and maintain systems with the same level of 9-1-1 service that other end users receive. It is essential that every telephone connected to a multi-line telephone system provide a callback number and specific dispatchable address where the 9-1-1 call originated. The specific dispatchable address must also include a building name or number, floor and/or room number. This information needs to be sent from the telephone system through the 9-1-1 network to a Public Safety Answering Point (PSAP) when someone dials 9-1-1.

17. That MLTS providers utilize contracts and agreements to facilitate additional liability protection, as deemed necessary.