**3GPP TSG-SA2 Meeting #165S2-2410641**

**Hyderabad, India, 14 - 18 October, 2024 (was S2-2410580)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.273** | **CR** | **0608** | **rev** | **1** | **Current version:** | **19.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Multiple Location Report for Next Generation Emergency Routing | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI19\_MLR4RTR | | | | |  | ***Date:*** | | | 2024-09-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | As per regulatory requirements described in the discussion paper - S2-2402544, location-based emergency call routing requires device location to be available on each routing hop without delaying the emergency call set-up process. Therefore, LCS in the operator network shall provide the location to multiple LCS clients (e.g., emergency call routing entities) for the same device, and meet the QoS and delay expected by the sequence of the routing entities.  Multiple routing entities can have better and better location results while hop-by-hop routing is performed. More accurate result can be available to more recent LCS request. For example, the initial hop to nation-wide routing entity may be routed based on initial cell-based location. Subsequent hops can be routed based on a more accurate location estimates when more measurements are available afterwards, especially when device is nearby the border of different PSAP serving areas.  Multiple Location Procedure defined in clause 6.1.3 of TS 23.273 serves only a single (PSAP) client. It shall be enhanced to provide a sequent of locations to be requested by multiple LCS Clients (e.g., emergency call routing entities) possibly within a single LCS session. | | | | | | | | |
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| ***Summary of change:*** | | Adding a new section to enable multiple location procedure for multiple LCS Clients (e.g., emergency routing entities). | | | | | | | | |
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| ***Consequences if not approved:*** | | Location results for routing may not meet the regulatory delay and QoS requirements due to multiple routing hops. | | | | | | | | |
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| ***Clauses affected:*** | | 2, 6.10.x | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* First Change [all new] \* \* \*

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 22.071: "Technical Specification Group Systems Aspects; Location Services (LCS)".

[3] 3GPP TS 22.261: "Service requirements for the 5G system; Stage 1".

[4] 3GPP TS 23.271: "Functional stage 2 description of Location Services (LCS)".

[5] 3GPP TS 43.059: "Functional Stage 2 description of Location Services in GERAN".

[6] Void.

[7] 3GPP TS 36.305: "Stage 2 functional specification of User Equipment (UE) positioning in E-UTRAN".

[8] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[9] 3GPP TS 38.305: "Stage 2 functional specification of User Equipment (UE) positioning in NG-RAN".

[10] 3GPP TS 23.167: "IP Multimedia Subsystem (IMS) emergency sessions".

[11] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[12] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[13] OMA MLP TS: "Mobile Location Protocol", [http://www.openmobilealliance.org].

[14] Void.

[15] 3GPP TS 38.455: "NG-RAN; NR Positioning Protocol A (NRPPa)".

[16] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[17] 3GPP TS 25.305: "Stage 2 functional specification of User Equipment (UE) positioning in UTRAN".

[18] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[19] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[20] 3GPP TS 37.355: "LTE Positioning Protocol (LPP)".

[21] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[22] Void.

[23] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[24] 3GPP TS 23.222: "Common Application Programming Interface (API) framework for 3GPP northbound APIs".

[25] RFC 2396: "Uniform Resource Identifiers".

[26] RFC 3261: "SIP: Session Initiation Protocol".

[27] 3GPP TS 23.228: "IP multimedia subsystem (IMS)".

[28] 3GPP TS 23.003: "Numbering, addressing and identification".

[29] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[30] 3GPP TS 32.271: "Telecommunication management; Charging management; Location Services (LCS) charging".

[31] 3GPP TS 32.298: "Telecommunication management; Charging management; Charging Data Record (CDR) parameter description".

[32] Void.

[33] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[34] Void.

[35] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[36] 3GPP TS 24.571: "5G System (5GS); Control plane Location Services (LCS) procedures; Stage 3".

[37] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[38] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

[39] 3GPP TS 22.104: "Service requirements for cyber-physical control applications in vertical domains".

[40] 3GPP TS 23.586: "Architectural Enhancements to support Ranging based services and Sidelink Positioning".

[41] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[42] 3GPP TS 23.632: "User data interworking, coexistence and migration; Stage 2".

[43] 3GPP TS 29.563: "Home Subscriber Server (HSS) services for interworking with Unified Data Management (UDM); Stage 3".

[44] 3GPP TS 33.536: "Security aspects of 3GPP support for advanced Vehicle-to-Everything (V2X) services".

[45] 3GPP TS 33.503: "Security Aspects of Proximity based Services (ProSe) in the 5G System (5GS)".

[46] 3GPP TS 33.533: "Security aspects of ranging based services and sidelink positioning".

[47] 3GPP TS 38.355: "Sidelink Positioning Protocol (SLPP)".

[48] 3GPP TS 24.572: " User Plane Location Services (LCS) Protocols And Procedures; Stage 3".

[49] OMA-AD-SUPL-V2\_0: "Secure User Plane Location Architecture Approved Version 2.0".

[50] 3GPP TS 33.501: " Security architecture and procedures for 5G system".

[51] 3GPP TS 33.256: "Security aspects of Uncrewed Aerial Systems (UAS)".

[xx] RFC 5985: "HTTP-Enabled Location Delivery (HELD)".

\* \* \* Second Change [all new] \* \* \*

6.10.x Multiple location procedure for multiple emergency LCS clients

Multiple location procedure for multiple emergency LCS clients (e.g., routing entities including routing proxy or a redirect server in TS 23.167 [10]) in the same emergency session is an extension procedure of 5GC-MT-LR multiple location procedure without UDM Query defined in clause 6.10.4, with thefollowing differences:

1. There is one or a sequence of location request(s) from one or a series of emergency LCS clients' (e.g., LCS requests for routing defined in clauses 4.3.4 and 6.10). GMLC identifies by the LCS Clients' requests (e.g., by LCS Client profile as emergency routing entity, or the request being HELD [xx], etc) that it is an emergency call routing procedure and carries out the multiple location procedure defined in clause 6.10.4. The INTERMEDIATE tag in the request defined in 6.10.4 and the response time in the request are not mandatory in this case.

2. At step 2.2 in clause 6.10.4, GMLC starts responding to one or a series of the request(s) from different external emergency clients based on the available cached INTERMEDIATE/FINAL result(s) from LMF. When GMLC receives and responds to the requests from multiple emergency LCS clients, GMLC may process the request as per configurations of multiple LCS Clients' profiles and/or request parameters (e.g., maximum response time, maximum age of location, etc).

NOTE: It is operator policy-specific and/or regulatorily different how GMLC responds with the result from the available cached INTERMEDIATE/FINAL result(s), e.g., the most recent one or the most accurate one.

\* \* \* End of Change \* \* \*