**3GPP TSG-SA WG6 Meeting #52-bis-e S6-230100r01**

**e-meeting*,* 11th – 20th January 2023 (revision of S6-22xxxx)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.434** | **CR** | **0147** | **rev** | **-** | **Current version:** |  |  |
|  | | | | | | | | |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Location profiling for supporting fused location service enablement | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | SA6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GFLS | | | | |  | ***Date:*** | | | 2023-01-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | |  |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Based on the conclusion of KI#3 in TR 23.700-96, the solution#5 will be considered in the normative phase. The related function, procedure and information flow will be specified in TS 23.434 to support solution#5. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | To add the procedure and information flow for location profiling according to the conclusion of KI#3 in TR 23.700-96. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The 5G-enabled fused location service capability will not support location profiling for SEAL location management. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2,9.3.x(new),9.3.2.x(new),Annex X(new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

# 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 22.104: "Service requirements for cyber-physical control applications in vertical domains".

[3] 3GPP TS 23.379: "Functional architecture and information flows to support Mission Critical Push To Talk (MCPTT); Stage 2".

[4] 3GPP TS 23.280: "Common functional architecture to support mission critical services; Stage 2".

[5] 3GPP TS 23.281: "Functional architecture and information flows to support Mission Critical Video (MCVideo); Stage 2".

[6] 3GPP TS 23.282: "Functional architecture and information flows to support Mission Critical Data (MCData); Stage 2".

[7] 3GPP TS 23.286: "Application layer support for V2X services; Functional architecture and information flows".

[8] 3GPP TS 23.222: "Functional architecture and information flows to support Common API Framework for 3GPP Northbound APIs; Stage 2".

[9] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[10] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[11] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[12] 3GPP TS 23.303: "Proximity-based services (ProSe); Stage 2".

[13] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[14] 3GPP TS 23.002: "Network Architecture".

[15] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[16] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE\_LTE); Stage 2".

[17] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".

[18] 3GPP TS 23.203: "Policy and charging control architecture".

[19] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[20] 3GPP TS 26.348: "Northbound Application Programming Interface (API) for Multimedia Broadcast/Multicast Service (MBMS) at the xMB reference point".

[21] 3GPP TS 29.214: "Policy and charging control over Rx reference point".

[22] 3GPP TS 29.468: "Group Communication System Enablers for LTE (GCSE\_LTE); MB2 Reference Point; Stage 3".

[23] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[24] IETF RFC 6733 (October 2012): "Diameter Base Protocol".

[25] ETSI TS 102 894-2 (V1.2.1): "Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer common data dictionaryMultimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".

[26] ETSI TS 102 965 (V1.4.1): "Intelligent Transport Systems (ITS); Application Object Identifier (ITS-AID); Registration".

[27] ISO TS 17419: "Intelligent Transport Systems - Cooperative systems - Classification and management of ITS applications in a global context".

[28] 3GPP TS 26.346: "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".

[29] 3GPP TS 33.434: "Service Enabler Architecture Layer (SEAL); Security aspects for Verticals".

[30] 3GPP TS 29.549: "Service Enabler Architecture Layer for Verticals (SEAL); Application Programming Interface (API) specification; Stage3".

[31] 3GPP TS 23.285: "Architecture enhancements for V2X services".

[32] IETF RFC 7252: "The Constrained Application Protocol (CoAP)".

[33] IETF RFC 8323: "CoAP (Constrained Application Protocol) over TCP, TLS, and WebSockets".

[34] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[35] IEEE Std 802.1Qcc-2018: "Standard for Local and metropolitan area networks - Bridges and Bridged Networks - Amendment: Stream Reservation Protocol (SRP) Enhancements and Performance Improvements".

[36] IEEE 802.1Q-2018: "IEEE Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks".

[37] IEEE Std 802.1CB-2017: "Frame Replication and Elimination for Reliability".

[38] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[39] 3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".

[40] 3GPP TS 23.435: "Procedures for Network Slice Capability Exposure for Application Layer Enablement Service".

[41] 3GPP TS 28.531: "Management and orchestration; Provisioning".

[42] 3GPP TS 28.533: "Management and orchestration; Architecture framework".

[43] 3GPP TS 28.530: "Management and orchestration; Concepts, use cases and requirements".

[44] 3GPP TS 28.532: "Management and orchestration; Generic management services".

[45] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements".

[46] 3GPP TS 28.554: "Management and orchestration; 5G end to end Key Performance Indicators (KPI)".

[47] 3GPP TS 28.104: "Management and orchestration; Management Data Analytics".

[48] 3GPP TS 23.433: "Service Enabler Architecture Layer for Verticals (SEAL); Data Delivery enabler for vertical applications".

[49] 3GPP TS 23.436: "Procedures for Application Data Analytics Enablement Service".

[x] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2

\* \* \* 2nd Change \* \* \* \*

## 9.3 Procedures and information flows for Location management (on-network)

### 9.3.x Location profiling for supporting fused location service enablement

### 9.3.x.1 Location profiling

The location management server enhanced with the Fuse Location Function(FLF) supports the creation of location profiles for location service at the application enablement layer and the mapping of location profiles to one or more vertical applications. Location profiling is based on the vertical driven hybrid positioning requirements and policies.

The example of attributes that can be used for the location profiles is sepecified in Annex X.

### 9.3.x.2 Procedure of Location profiling for fused location service

The procedure includes the translation of the vertical request to a location profile and the derivation of the requested location information report.

Pre-condition: The Location Management Server has configured a set of location service profiles and stored them in internal database.



Figure 9.3.x.2-1: Location profiling for fused location derivation and exposure

1. The Location Management Server(LMS) configures a set of location service profiles, where each location service profile may include metrics like the attributes in the table X-1 of Annex X.

2. The LMS receives a location reporting trigger from VAL server which may include a VAL server ID, location QoS requirements (accuracy, response time), location granularity (coordinates, cell-level, civic addresses, topological location), vertical specific support information (planned route, road maps), time validity for the requirement, area of validity, event triggering criteria, and activates a location reporting procedure as defined in clause 9.3.5.

3. The LMS determines a mapping of the vertical location services to a location service profile based on the location request information, the location profiles stored in internal database, the location capability of VAL UE which registrated to LMS before.

4. The LMS informs the Location Management Client (LMC) optionally the configuration of the mapping of the application to a location profile.

NOTE: The specific messages how the LMS communicate with LMC to transfer the LCS mapping configuration will be defined in CT1.

5a. The LMS requests from the LMC the location information of the target VAL UE.

5b. The LMC responds to the LMS the location report based on the request.

6. The LMS performs a location information request to one or more of the following (based on the location profile):

- to GMLC directly or via NEF (as definied in TS 23.273[x]), acting as AF. The LCS service request is sent to GMLC via NEF using the service-based interface or CAPIF API;

- to 3rd party location servers.

7. The LMS calculates the fused location information based on combined location reports from step 5~6 and checks whether the location reports fulfill the location profile requirements.

8-9. If the requirements are not fulfilled, the LMS iteratively requests further location information and re-checks whether the requirements are met or not.

10. If the requirements are fulfilled, the LMS sends the location information report to the VAL server.\* \* \* 3rd Change \* \* \* \*

#### 9.3.2.4 Location reporting trigger

Table 9.3.2.4-1 describes the information flow from the location management client or VAL server to the location management server for triggering a location reporting procedure.

Table 9.3.2.4-1: Location reporting trigger

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Identity | M  (see NOTE 1) | Identity of the requesting authorized VAL user or VAL UE or VAL server |
| Identity | M  (see NOTE 1) | Identity of the requested VAL user or VAL UE |
| VAL service ID | O | Identity of the VAL service for which the location reporting trigger is set. |
| Immediate Report Indicator | O  (see NOTE 2) | Indicates whether an immediate location report is required |
| Requested location information | O  (see NOTE 2) | Identifies what location information is requested |
| Triggering criteria | O  (see NOTE 2) | Identifies when the requesting client/VAL server is expecting to receive the location report from the requested VAL user/ VAL UE. It may include VAL service Area ID based criteria when this information flow is from VAL server to the location management server. |
| >Time validity | O | Identity of the location time validity for which the location information is requested. |
| >Area validity | O | Identity of the location area validity for which the location information is requested. |
| Minimum time between consecutive reports | O  see (NOTE 2) | Defaults to 0 if absent otherwise indicates the interval time between consecutive reports |
| Endpoint information | O | Information of the endpoint of the requesting VAL server to which the location report notification has to be sent. It is provided if Immediate Report Indicator is set to required. |
| NOTE 1: The identity of the requesting VAL user/UE/VAL server and the requested VAL user/UE should belong to the same VAL service.  NOTE 2: At least one of these rows shall be present. | | |

\* \* \* 4th Change \* \* \* \*

Annex X (informative):  
Exemplary location profile attributes

The table X-1 shows shows the example of attributes that can be used for the location profiles.

Table X-1: Exemplary location profile attributes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Profile ID / name | Vertical / use case/environment | Positioning Service Level (for IIOT) / QoS / accuracy | Positioning Method(s) / Priorities | Involved 3GPP functionalities / Priorities | Involved non-3gpp access networks | Required APIs / API info | Other |
| Location profile #1 | Industrial scenario; indoors; mobile robots/ AGVs | Service Level 6 /  cm level accuracy / absolute/relative/ both | 1. DL-TDOA,  2. UL-TDOA,  3. Multi-RTT methods,  4. WLAN, 5. motion sensors,  6. Bluetooth | 1. LMF  2. RAN-LMC, 3. SEAL LMS | 1. WLAN ID | NEF APIs, SEAL APIs | Verification / augmentation required |
| Location profile #2 | V2X;  outdoor | Decimeter level accuracy /... absolute/relative/both | 1. DL-TDOA,  2. Multi-RTT methods,  3. GNSS-RTK,  4. Sensor fusion,  5. A-GPS | 1. LMF  2. SEAL LMS  3. Other UEs | 1. GNSS #x, #y,  2. MEC #x | NEF APIs, MEC APIs | Support for sidelink positioning |

\* \* \* End of Changes \* \* \* \*