**3GPP TSG-SA WG6 Meeting #63 S6-244613**

**Hyderabad, India, 14th – 18th Oct 2024 (revision of S6-244177)**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **23.434** | **CR** | **0328** | **rev** | **1** | **Current version:** | **19.3.0** |  |
|  |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | LMS reuse the stored UE location information considering the location validity |
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| ***Source to WG:*** | CATT |
| ***Source to TSG:*** | SA6 |
|  |  |
| ***Work item code:*** | eLSAPP |  | ***Date:*** | 2024-10-07 |
|  |  |  |  |  |
| ***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 canbe 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)* |
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| **Reason for change:** | According to the TR 23.700-72 v1.1.1, the KI#3 for Location QoS improvement has been concluded as follows:*Solution #1 and Solution#6 addressing the KI#3 can be considered in the normative work. The related function and procedure will be specified in 3GPP TS 23.434 [9] to support both of solutions, and the detailed APIs and information flows can be discussed in the normative phase.*So it’s needed to specify the functions, procedures and information flows for such KI in TR 23.434 for the normative work. This CR focuses on how to specify the function for Sol#6 in TS 23.434. The Sol#6 proposes the LMS can reuse the stored UE location information to report to the VAL server to reduce the response time. And the validity for the stored location should also be checked and verified via LMS. So the LMS will consider the predicated location analysis from NWDAF to determine whether to resue the stored UE location data when the next periodic time is coming. |
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| ***Summary of change:*** | LMS will consider the predicated location analysis from NWDAF to determine whether to resue the stored UE location data. |
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| ***Consequences if not approved:*** | If the solution can’t be performed, the LCS QoS requested via the application server will not be met via the SEAL-LM. |
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| ***Clauses affected:*** | 9.3.5,9.3.8 |
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|  | **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 \* \* \* \*

### 9.3.5 Client-triggered or VAL server-triggered location reporting procedure

Figure 9.3.5-1 illustrates the high level procedure of client-triggered or VAL server-triggered location reporting.



Figure 9.3.5-1: Client-triggered location reporting procedure

1. Location management client 2 (authorized VAL user or VAL UE) or VAL server sends a location reporting trigger to the location management server to activate a location reporting procedure for obtaining the location information of location management client 1. The location reporting event triggers as specified in table 9.3.2.4-1, e.g. minimum time between consecutive reports, SAI changes, access RAT changes, or ECGI changes for reporting the location of the VAL UE, are included.

NOTE: Step 1 can be performed when Location management client 2 or VAL server require to update the location reporting trigger corresponding to location management client 1.

2. Location management server checks whether location management client 2 or VAL server is authorized to send a location reporting trigger. If the immediate report indicator is included in step 1 and there is valid location report of the target UE (i.e. the timer for the stored location report is not expired), the LM server reuses the stored UE location report and sends the report to the location management client 2 or VAL server.

a. If the adaptive reporting is requested in step 1, the location management server interacts with NWDAF (e.g., UE mobility analytics as defined in clause 6.7.2 of 3GPP TS 23.288 [34]) to obtain the location management client 1 moving statistic and prediction.

i. If "DIRECT UPDATE" is requested, the location management server determines the reporting configuration based on VAL service ID, VAL server ID, and the retrieved location management client 1 moving statistic and prediction. In order to adapt the configuration, the location management server may determine, for example, whether to increase or decrease the frequency of the report based on the UE's mobility pattern, or update location change condition (e.g., to change the location accuracy).

ii. If "SUGGESTIVE UPDATE" is requested, the location management server initially uses the configuration provided by VAL server and later dynamically adjusts the reporting configuration to determine adaptive location configuration based on VAL service ID, VAL server ID, and by analysing the retrieved location management client 1 moving statistic and prediction and received location information. In order to adapt the configuration, the location management server may determine, for example, whether to increase or decrease the frequency of the report based on the UE's mobility pattern, or update the location change condition (e.g., to change the location accuracy).

b. If the valid location report is not available, depending on the information specified by the location reporting trigger or determined reporting configuration (if "DIRECT UPDATE" is requested), location management server initiates an on-demand location reporting procedure or an event-triggered location reporting procedure for the location of location management client 1.

3. Once the location information of the location management client 1 is available in the location management server by the on-demand location reporting procedure, a location information report is sent to the location management client 2 or VAL server.

Further, if adaptive reporting is enabled by the VAL server with "SUGGESTIVE UPDATE", the location management server dynamically adjusts the reporting configuration as specified above (in step 2.a.ii).

Once location configuration is adjusted and if it is required to update the triggers to the SEAL client, the SEAL LMS may suggest the adaptive location configuration to the VAL server (or authorized SEAL LM client) as specified in clause 9.3.19. If VAL server accepts the suggested adaptive location configuration, then the location management server initiates an on-demand location reporting procedure or an event-triggered location reporting procedure for the location of location management client 1. If VAL server rejects the suggested adaptive location configuration, then the location management server will discard the updated configuration.

\* \* \* Next Change \* \* \* \*

### 9.3.8 Event-trigger location information notification procedure

Figure 9.3.8-1 illustrates the high level procedure of event-trigger usage of location information. The same procedure can be applied for location management client and other entities that would like to subscribe to location information of VAL user or VAL UE. This procedure is also used for obtaining latest UE's location for tracking purpose.



Figure 9.3.8-1: Event-trigger usage of location information procedure

1. The location management server receives the latest location information of the UE as per the location report procedure described in clause 9.3.3.3.

2. The location management server may optionally receive the location information of the UE from 3GPP core and/or the 3rd party location management server network. If the indication for supplementary location information is included in the subscription, then UE location information is obtained from the 3GPP core network and/or the 3rd party location management server. If the velocity information of target UE is requested, the LM server asks the LM client or 3GPP core network to report the target UE location data with the requested velocity information.

3. Based on the configurations, e.g., subscription, periodical location information timer, location management server is triggered to report the latest user location information to VAL server. The location management server determines the location information of UE as received in steps 1 and 2, including the supplementary location information (if indicated). The Location management server may report the location to the VAL server considering the location information received via non-3GPP positioning technologies (e.g. GNSS, Bluetooth), for instance, to improve the location accuracy. The location management server may reuse the stored and valid UE location information (if any) to report to the VAL server/LM client to reduce the response time when the trigger condition is time-based. And the LM server may interact with NWDAF to obtain the target UE’s prediction location as defined in clause 6.7.2 of 3GPP TS 23.288[34] to determine if the stored UE location is still valid during the periodic time interval and reuse the stored valid UE location to report to the VAL server when the next periodic time is triggered.

If the indication whether the statistic of target UE location is included in the request from the VAL server/LM client, the LM server calculates the received UE location data per temporal/spatial granularity as requested and then expose them to the VAL server/LM client for the valued-added location information.

4. Same as step 5-9 of Figure 9.3.7-1.

4. The location management server sends the location information report including the latest location information of one or more VAL users or VAL UEs to the VAL server or to the location management client that has previously configured. In addition, velocity of the requested VAL UEs may be included as part of the location information report.

5. VAL server may further share this location information to a group or to another VAL user or VAL UE.

NOTE: For other entities, the step 5 can be skipped if not needed.

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