**3GPP TSG-WG SA2 Meeting #155 *S2-23xxxxx***

**February 20 – 24, 2023, Athens (revision of S2-23xxxx)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.273** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.0.0** |  |
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| *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:*** | Updates to network verification for satellite access | | | | | | | | | |
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| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_eLCS\_Ph3 | | | | |  | ***Date:*** | | | 2023-02-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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:*** | | This CR implements KI#9 conclusion on network verification for satellite access on top of the existing R17 solution within the 5GC-NI-LR procedure. In particular the CR introduces assistance information to AMF from NWDAF to perform UE location verification decision. | | | | | | | | |
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| ***Summary of change:*** | | Introduced new steps in procedure of Figure 6.10.1-1 showing interactions with AMF to request analytics and AMF performing the verification decision. | | | | | | | | |
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| ***Consequences if not approved:*** | | Incomplete 5G\_eLCS\_Ph3 normative implementation. | | | | | | | | |
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| ***Clauses affected:*** | | 6.10 | | | | | | | | |
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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 \* \* \* \*

### 6.10.1 5GC-NI-LR Procedure

Figure 6.10.1-1 shows a Network Induced Location Request (NI-LR) procedure for a UE in the case where the UE initiates an emergency session or other session using NG-RAN. The procedure assumes that the serving AMF is aware of the regulatory service associated with the session (e.g. emergency session initiation - e.g. due to supporting an Emergency Registration procedure or assisting in establishing an emergency PDU Session). The procedure can also be used to verify UE location for NR satellite access.



Figure 6.10.1-1: 5GC Network Induced Location Request (5GC-NI-LR) for a UE

1. A trigger for AMF to initiate the 5GC-NI-LR procedure happens, e.g. the UE registers to the 5GC for emergency services or requests the establishment of a PDU Session related to an applicable regulatory service (e.g. emergency session initiation) or the AMF decides to verify UE location (country or international area or with specific LCS QoS Class) via LCS service and optionally NWDAF analytics for a UE registering or is registered for NR satellite access.

2. For verifying UE location via LCS service for NR satellite access this step is mandatory, for other triggers the step is optional. The AMF selects an LMF based on NRF query or configuration in AMF and invokes the Nlmf\_Location\_DetermineLocation service operation towards the LMF to request the current location of the UE. The service operation includes a LCS Correlation identifier, the serving cell identity of the Primary Cell in the Master RAN node and the Primary Cell in the Secondary RAN node when available based on Dual Connectivity scenarios, and an indication of a location request from a regulatory services client (e.g. emergency services) and may include an indication if UE supports LPP, the required QoS and Supported GAD shapes, the UE Positioning Capability if available. When AMF needs to know the geographical area of the UE to check whether the PLMN is allowed to operate in the area, an indication of this is included. When AMF needs to verify the location of the UE when a UE registers via NR satellite access, the AMF includes in indication in the request to the LMF that the request is for UE location verification. If any of the procedures in clause 6.11.1 or 6.11.2 are used the service operation includes the AMF identity.

3. [Conditional] If step 2 occurs, the LMF performs one or more of the positioning procedures described in clause 6.11.1, 6.11.2 and 6.11.3. If the AMF included an indication of UE country determination at step 2, the LMF maps the UE location to a geographical area where a PLMN is or is not allowed to operate.

4. [Conditional] If step 3 occurs, the LMF returns the Nlmf\_Location\_DetermineLocation Response towards the AMF to return the current location of the UE. The service operation includes the LCS Correlation identifier, the location estimate, its age and accuracy and may include information about the positioning method and the timestamp of the location estimate. The service operation also includes the UE Positioning Capability if the UE Positioning Capability is received in step 3 including an indication that the capabilities are non-variable and not received from AMF in step 2. When UE geographical area determination for location verification is indicated at step 2, the service operation also returns the geographical area where a PLMN is or is not allowed to operate determined at step 3.

5-7. [Conditional] The AMF may request assistance information from NWDAF to verify the location of the UE registering or registered for NR satellite access. In that case, AMF requests data analytics from NWDAF containing UE location information. If the analytics are not available, NWDAF derives the requested analytics and provides a response to the AMF.

8. [Conditional] Based on the previous steps, AMF decides whether the UE should or should not be allowed access via NR satellite access and interacts with NG-RAN and/or the UE to convey the decision.

NOTE 1: Any remaining procedures for regulatory services other than emergency services are not addressed in this flow. The remaining steps are applicable for emergency services.

9. [Conditional] For emergency services, the AMF selects an GMLC based on NRF query or configuration in AMF. The information regarding the endpoint in the GMLC to deliver the event notification, is obtained from the NRF as specified in clause 7.1.2 of TS 23.501 [18] or from local configuration in the AMF. AMF invokes the Namf\_Location\_EventNotify service operation towards the selected GMLC to notify the GMLC of an emergency session initiation. The service operation includes the SUPI or the PEI, and the GPSI if available, the identity of the AMF, an indication of an emergency session and any location obtained in step 3.

10. [Conditional] For emergency services, the GMLC forwards the location to an external emergency services client or may wait for a request for the location from the external emergency services client (not shown in Figure 6.10.1-1) before forwarding the location.

11. [Conditional] For emergency services, the emergency services session and emergency PDU Session are released.

12. [Conditional] For emergency services, the AMF invokes the Namf\_Location\_EventNotify service operation towards the GMLC to notify the GMLC that the emergency session was released to enable the GMLC and LRF to release any resources associated with the emergency session.

\* \* \* \* End of changes \* \* \* \*