**3GPP TSG-CT WG4 Meeting #111-e C4-224**

**E-Meeting, 18th – 26th August 2022 was C4-224350**

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| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **29.572** | **CR** | **0140** | **rev** | **1** | **Current version:** | **17.5.0** |  |
|  |
| *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:***  | Indication of Network Assisted Positioning method |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | C4 |
|  |  |
| ***Work item code:*** | ID\_UAS, 5G\_eLCS\_ph2 |  | ***Date:*** | 2022-08-10 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | TS 33.256 defined the Location information veracity and location tracking authorization in 5GS in clause 5.3.2 as below：1. The USS sends the location request to UAS NF/NEF to request the UAV location or presence from network. The location request includes the GPSI of the UAV to request the location information or presence about an individual UE, or a geographic area when trying to find the information of all UAVs in an area. The LCS request also indicates the 5GS to obtain reliable UE location information, i.e. the location calculated and provided by the network. If the USS/TPAE does not specify target 3GPP UAV ID and request UAS NF for a list of the UAVs in the geographic area and served by the PLMN, clauses 5.3.1.3 and 5.3.4 in TS 23.256 [3] apply.2. The UAS NF/NEF first verifies the request in step 1 is authorized. When the USS sends a GPSI, this is done by checking whether the identifier of the USS sending the request matches the previously associated mapping between the GPSI and the USS identifier. When the USS request UAS NF for a list of the UAVs in the geographic area, this is done by checking the USS is authorized to receive the CAA level ID of all UAVs in a geographic area indicated by the USS. The UAS NF/NEF gets the relevant UAV(s) location information or presence from AMF or GMLC by the current location services supported by AMF or GMLC if passes the above authorization check. On the condition of the location services provided by AMF, the UE presence status is provided by reusing the Area of Interest mechanism. On the condition of the location services provided by GMLC, the GMLC indicates LMF via AMF to select Network Assisted Positioning method which relies on the location measurement from NG-RAN nodes, if receiving reliable location information request in step 1.Based on the reply LS S3-221254 below:**CT4 question:** *However, there is no clear definition of high reliability requirement in Stage2. There are 2 alternatives for implementation of this indication in CT4.**- If the positioning for UAS requires (or will potentially require in future) some specific treatment in GMLC/LMF, it is better to extend the LCS service type by Stage 1 and Stage 2.* *- If only the high reliability requirement is needed, i.e. the UAS NF/NEF will either use AMF with PRA mechanism or using GMLC/AMF/LMF with network assisted positioning, then an indication on GMLC API implemented by CT4 is sufficient.* *CT4 would like to ask SA3, SA2 kindly clarify the scenario and the definition of above high reliability requirement in stage 2, thus help CT4 to select the appropriate alternative in stage 3 implementation.* **SA3 answer:**In general, both alternatives are acceptable from the security perspective of view. SA3 tends to recommend alternative 2 for sake of progress.SA3 would also like to provide the background for information. As specified in TS 33.256, the location information from 5GS is used to check and verify the location information reported by UAV via the application layer. The location information from 5GS with high reliability is expected. ‘High reliability’ is clarified in the attached CR. There is an indication to indicate 5GS to obtain reliable UE location information and implicit indicate LMF to select Network Assisted Positioning method.  |
|  |  |
| ***Summary of change:*** | It proposes to add the indication in InputData. |
|  |  |
| ***Consequences if not approved:*** | It is not aligned with Stage2 |
|  |  |
| ***Clauses affected:*** | 2, 6.1.6.2.2, A.2 |
|  |  |
|  | **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 introduces backward compatibile corrections to the OpenAPI files of Nlmf\_Location API. |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* Begin of Changes \* \* \* \*

# 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 23.501: "System Architecture for the 5G System; Stage 2".

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

[4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[6] IETF RFC 4776: "Dynamic Host Configuration Protocol (DHCPv4 and DHCPv6) Option for Civic Addresses Configuration Information".

[7] IETF RFC 5139: "Revised Civic Location Format for Presence Information Data Format Location Object (PIDF-LO)".

[8] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[9] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[10] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[11] 3GPP TS 29.510: "Network Function Repository Services; Stage 3".

[12] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

[13] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[14] OpenAPI Initiative, "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[15] IETF RFC 7807: "Problem Details for HTTP APIs".

[16] 3GPP TR 21.900: "Technical Specification Group working methods".

[17] 3GPP TS 22.071: "Location Services (LCS); Service description; Stage 1".

[18] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[19] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[20] 3GPP TS 24.080: "Mobile radio interface layer 3 Supplementary services specification; Formats and coding".

[21] 3GPP TS 37.355: " LTE Positioning Protocol (LPP)".

[22] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[23] 3GPP TS 29.518: "Access and Mobility Management Services".

[24] 3GPP TS 29.171: "Location Services (LCS); LCS Application Protocol (LCS-AP) between the Mobile Management Entity (MME) and Evolved Serving Mobile Location Centre (E-SMLC); SLs interface".

[25] IETF RFC 4119: "A Presence-based GEOPRIV Location Object Format".

[x1] 3GPP TS 33.256: "Security aspects of Uncrewed Aerial Systems (UAS)".

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

##### 6.1.6.2.2 Type: InputData

Table 6.1.6.2.2-1: Definition of type InputData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| externalClientType | ExternalClientType | O | 0..1 | When present, this IE shall carry the external client type of the requester. |  |
| correlationID | CorrelationID | O | 0..1 | When present, this IE shall carry the correlation ID of the request. |  |
| amfId | NfInstanceId | O | 0..1 | Indicates the AMF Instance serving the UE. LMF shall use the AMF Instance to forward LCS related N1/N2 messages to the UE/RAN. |  |
| locationQoS | LocationQoS | O | 0..1 | When present, this IE shall carry the QoS of the location request. |  |
| supportedGADShapes | array(SupportedGADShapes) | O | 1..N | When present, this IE shall carry the GAD shapes supported by the requester. |  |
| supi | Supi | O | 0..1 | Indicates the SUPI of the target UE. |  |
| pei | Pei | O | 0..1 | Indicates the PEI of the target UE. |  |
| gpsi | Gpsi | O | 0..1 | Indicates the GPSI of the target UE. |  |
| ecgi | Ecgi | O | 0..1 | When present, this IE shall indicate the identifier of the E-UTRAN cell serving the UE or the serving cell identifier of the Primary Cell in the Master RAN Node that is an E-UTRAN node on Dual Connectivity scenarios.(NOTE 2) |  |
| ecgiOnSecondNode | Ecgi | O | 0..1 | When present, the serving cell identifier of the Primary Cell in the Secondary RAN Node that is an E-UTRAN node when available on Dual Connectivity scenarios. (NOTE 3) (NOTE 4) |  |
| ncgi | Ncgi | O | 0..1 | When present, this IE shall indicate the identifier of the NR cell serving the UE or the serving cell identifier of the Primary Cell in the Master RAN Node that is a NR node on Dual Connectivity scenarios.(NOTE 2) |  |
| ncgiOnSecondNode | Ncgi | O | 0..1 | When present, the serving cell identifier of the Primary Cell in the Secondary RAN Node that is a NR node when available on Dual Connectivity scenarios. (NOTE 3) (NOTE 4) |  |
| priority | LcsPriority | O | 0..1 | When present, this IE shall indicate the priority of the location request. |  |
| velocityRequested | VelocityRequested | O | 0..1 | When present, this IE shall indicate whether velocity is requested or not. |  |
| ueLcsCap | UeLcsCapability | O | 0..1 | When present, this IE shall indicate the LCS capability supported by the UE. |  |
| lcsServiceType | LcsServiceType | O | 0..1 | The LCS service type |  |
| ldrType | LdrType | O | 0..1 | The type of LDR |  |
| hgmlcCallBackURI | Uri | C | 0..1 | Callback URI of the H-GMLCIt shall be present, if attribute LdrType is present. |  |
| vgmlcAddress | Uri | C | 0..1 | V-GMLC address that corresponds to the V-GMLC that receives Location RequestIt shall be present, if attribute LdrType is present and the target UE is in roaming case. |  |
| ldrReference | LdrReference | C | 0..1 | LDR Reference NumberIt shall be present, if attribute LdrType is present. |  |
| periodicEventInfo | PeriodicEventInfo | C | 0..1 | Information for periodic event reporting |  |
| areaEventInfo | AreaEventInfo | C | 0..1 | Information for area event reporting |  |
| motionEventInfo | MotionEventInfo | C | 0..1 | Information for motion event reporting |  |
| reportingAccessTypes | array(ReportingAccessType) | O | 1..N | Allowed access types for event reporting |  |
| ueConnectivityStates | array(UeConnectivityState) | O | 1..N | When present, this IE shall indicate the UE connectivity state per access type |  |
| ueLocationServiceInd | UeLocationServiceInd | C | 0..1 | If UE sends an MO-LR Request message, this IE shall be present and indicate the request type for a 5GC-MO-LR. |  |
| moAssistanceDataTypes | LcsBroadcastAssistanceTypesData | O | 0..1 | When present, this IE shall indicate a list of one or more types of location assistance data that UE subscribed.  |  |
| lppMessage | RefToBinaryData | C | 0..1 | If UE includes the first LPP message in MO-LR Request, this IE shall be present and Indicate the binary data of LPP message.(NOTE 5) |  |
| lppMessageExt | array(RefToBinaryData) | C | 1..N | If UE includes the additional LPP messages (maximum 3) in MO-LR Request, this IE shall be present and Indicates the binary data of LPP message.(NOTE 5) |  |
| supportedFeatures | SupportedFeatures | C | 0..1 | This IE shall be present if at least one optional feature defined in clause 6.1.9 is supported. |  |
| uePositioningCap | UePositioningCapabilities | O | 0..1 | When present, this IE shall indicate the positioning capabilities supported by the UE. |  |
| tnapId | TnapId | O | 0..1 | When present, this IE shall contain the TNAP Identifier.This IE may be present for non-3GPP access. |  |
| twapId | TwapId | O | 0..1 | When present, This IE shall contain the TWAP Identifier.This IE may be present for non-3GPP access. |  |
| ueCountryDetInd | boolean | O | 0..1 | When present, This IE shall contain an indication of determining the country or international area indication where UE is located. | SAT |
| scheduledLocTime | DateTime | O | 0..1 | When present, this IE shall contain the scheduled time that the UE needs to be located. |  |
| reliableLocReq | boolean | C | 0..1 | This IE shall be included with the value "true" to indicate that reliable UE location information is required, as specified in 3GPP TS 33.256 [x1] clause 5.3.2.When present, this IE shall be set as following:- true: the reliable UE location information is required- false (default): the reliable UE location information is not required |  |
| NOTE 1: At least one of the attributes defined in this table shall be present in the InputData structure.NOTE 2: Attribute "ecgi" and "ncgi" shall not be present at the same time.NOTE 3: Attribute "ecgiOnSecondNode" and "ncgiOnSecondNode" shall not be present at the same time.NOTE 4: Attribute "ecgiOnSecondNode" or "ncgiOnSecondNode" shall not be present if neither attribute "ecgi" nor "ncgi" is present.NOTE 5: If 3 LPP messages are received, then first LPP message shall be encoded in lppMessage IE and additional 2 LPP messages shall be encoded in lppMessageExt IE. |  |

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

# A.2 Ngmlc\_Location API

*(... text not shown for clarity ...)*

 schemas:

#

# COMPLEX TYPES

#

 InputData:

 description: Contains the input parameters in ProvideLocation service operation

 type: object

 required:

 - externalClientType

 properties:

 gpsi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

 supi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Supi'

 extGroupId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ExternalGroupId'

 intGroupId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/GroupId'

 externalClientType:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/ExternalClientType'

 locationQoS:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LocationQoS'

 supportedGADShapes:

 type: array

 items:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/SupportedGADShapes'

 minItems: 1

 serviceIdentity:

 $ref: '#/components/schemas/ServiceIdentity'

 serviceCoverage:

 type: array

 items:

 $ref: '#/components/schemas/E164CountryCodeOfGeographicArea'

 minItems: 1

 ldrType:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LdrType'

 periodicEventInfo:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/PeriodicEventInfo'

 areaEventInfo:

 $ref: '#/components/schemas/AreaEventInfoExt'

 motionEventInfo:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/MotionEventInfo'

 ldrReference:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LdrReference'

 hgmlcCallBackUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 eventNotificationUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 externalClientIdentification:

 $ref: '#/components/schemas/ExternalClientIdentification'

 afId:

 type: string

 uePrivacyRequirements:

 $ref: '#/components/schemas/UePrivacyRequirements'

 lcsServiceType:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LcsServiceType'

 velocityRequested:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/VelocityRequested'

 priority:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LcsPriority'

 locationTypeRequested:

 $ref: '#/components/schemas/LocationTypeRequested'

 maximumAgeOfLocationEstimate:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/AgeOfLocationEstimate'

 amfId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AmfId'

 codeWord:

 $ref: '#/components/schemas/CodeWord'

 scheduledLocTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

 reliableLocReq:

 type: boolean

 default: false

*(... text not shown for clarity ...)*

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