**3GPP TSG-CT WG4 Meeting #99eC4-204abc**

**E-Meeting, 18th – 28th June 2020 *was* C4-204295**

|  |
| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **29.515** | **CR** | **0016** | **rev** | **1** | **Current version:** | **16.1.0** |  |
|  |
| *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** |

|  |
| --- |
|  |
| ***Title:***  | Corrections on EventNotify service operation |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | 5G\_eLCS |  | ***Date:*** | 2020-08-11 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *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:*** | The first reason is,1. How VGMLC obtains the notification URI for Eventnotify service operation is not mentioned when roaming and VGMLC is used in 29.515.
2. How HGMLC or GMLC obtains the notification URI for Eventnotify service operation is not mentioned in 29.515.
3. The consumer NF of Eventnotify service operation includes (H)GMLC, NEF, the existing name hgmlcCallBackUri of the notification URI is ambiguous.

Therefore, how notification URI for Eventnotify service operation is obtained is not clear and need to add some text to describe, and the name of notification URI is suggested to be changed from hgmlcCallBackUri to locationNotificationUri.The second reason is,velocityEstimate, altitude (see definition of NotifiedPosInfo in 29.518) may be reported as part of location information by AMF to GMLC, when roaming and VGMLC is used, VGMLC should forward the received the report from AMF to HGMLC, therefore velocityEstimate, altitude should be also included in defintion of EventNotifyData (used as request body of Eventnotify service operation), but they are missing in existing defintion of EventNotifyData.The third reason is,TS 23.273 clause 6.3.1 (Initiation and Reporting of Location Events for deferred 5GC-MT-LR Procedur) step 9 and clause 8.4.2.4 mention that In the event of mobility of the UE to another AMF or to EPC when the UE becomes reachable, the old AMF can return an event indication to the (H)GMLC via (V)GMLC, therefore Eventnotify service operation need to forward the event indication from AMF to (H)GMLC, it means that the event indication and the target serving node (AMF/EPC) should be included in request of Eventnotify service operation |
|  |  |
| ***Summary of change:*** | 1. Added the text in clause 5.2.2.2.1 and clause 5.2.2.5.1 to describe how to set/get the Location Notification URI.
2. Changed the name hgmlcCallBackUri to locationNotificationUri.
3. Added attribute eventNotificationUri in data model InputData to contain the call-back URI of service consumer for implicit subscription of EventNotify.
4. Added velocityEstimate, ecgi, ncgi, altitude, barometricPressure attribute in the definition of data model EventNotifyData (used as request body of Eventnotify service operation).
5. Added value UE\_MOBILITY\_FOR\_DEFERRED\_LOCATION in data model EventNotifyDataType for indication of mobility event and added attribute targetNode in data model EventNotifyData to indicate the new serving AMF during mobility.
 |
|  |  |
| ***Consequences if not approved:*** | Current description may lead to different interpretations and implementations which may raise trouble in interoperability between different vendors. |
|  |  |
| ***Clauses affected:*** | 5.2.2.2.1, 5.2.2.5.1, 6.1.5.1, 6.1.4.2.2, 6.1.5.2.2, 6.1.5.2.6, 6.1.5.3.6, 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 will introduce backward compatible corrections in the OpenAPI specification file of TS29515\_Ngmlc\_Location.yaml. |
|  |  |
| ***This CR's revision history:*** | Rev1:1. Reverted the revision on Figure 5.2.2.2.1-1.
2. Removed new text “the callback URI of NEF registered in the NRF if the NEF registered to the NRF with notification endpoints for location notifications (see clauses 6.1.6.2.4 and 6.1.6.3.4 of 3GPP TS 29.510 [29]) and the callback URI is not provided during requesting the ProvideLocation service operation by the NEF, or ;” in 5.2.2.5.1.
3. Removed new attributes Ecgi, ncgi and barometricPressure in defintion of data model EventNotifyData because they are only needed in MT-LR for regulatory service.
4. Corrected typos in clause 6.1.5.1.
5. Corrected definition of EventNotify service operation in yaml
 |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Information\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.2.2.1 General

The service operation is used during the procedures:

- 5GC-MT-LR Procedure for the commercial location service (see 3GPP TS 23.273 [4], clause 6.1.2)

- Deferred 5GC-MT-LR Procedure for Periodic, Triggered and UE Available Location Events (see 3GPP TS 23.273 [4], clause 6.3.1)

The ProvideLocation service operation is invoked by a NF Service Consumer, e.g. a NEF or GMLC, towards the GMLC to request to provide the location information (geodetic location and, optionally, civic location) for a target UE or to subscribe to periodic or triggered deferred location for a target UE. See Figure 5.2.2.2.1-1..



Figure 5.2.2.2.1-1: ProvideLocation Request/Response

1. The NF Service Consumer shall send an HTTP POST request to the URI associated with the "provide-location" custom operation. The input parameters for the request (required QoS, supported GAD shapes, LCS client type, external Service Identity, Codeword, service coverage, LDR type, serving AMF address, LDR reference) should be included in the HTTP POST request body, H-GMLC Callback URI may be included in the HTTP POST request body to V-GMLC (eventually to AMF) for implicit subscrpiton of EventNotify provided by AMF, and NEF Callback URI may be included in the HTTP POST request body to GMLC/H-GMLC for implicit subscrpiton of EventNotify provided by GMLC/H-GMLC.

2a. On success, "200 OK" shall be returned. The response body shall contain the parameters related to the determined position of the UE if any (geodetic position, civic location, positioning methods…).

2b On failure, one of the HTTP status code listed in Table 6.1.3.2.2-2 may be returned. For a 4xx/5xx response, the message body may contain a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.1.3.2.2-2.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.2.5.1 General

The service operation is used during the procedure:

- Deferred 5GC-MT-LR Procedure for Periodic, Triggered and UE Available Location Events (see 3GPP TS 23.273 [4], clause 6.3.1 or clause 6.3.2)

The EventNotify enables the consumer NF (e.g. (H)GMLC, NEF) to get notified about the geodetic and optionally civic location, the completion or activation of deferred location, mobility to a different AMF/MME of a UE with deferred location for a target UE when some certain events are detected. See Figure 5.2.2.5.1-1.



Figure 5.2.2.5.1-1: EventNotify Notification

1. The GMLC shall send an HTTP POST to the locationNotificationUri to send a notification. The input parameters for the notification (Notification Correlation ID, UE (SUPI and if available GPSI), Type of location related event (e.g. deferred location for the UE available event, activation of location for periodic or triggered location, mobility of a target UE to a new AMF or MME for a deferred location, Geodetic Location, Civic Location, Position Methods Used, serving LMF identification etc.) should be included in the HTTP POST request body. The locationNotificationUri shall be set to:

If the notification is sent from (V)GMLC to (H)GMLC when roaming with (V)GMLC used,

- the hgmlcCallBackURI received from the AMF/LMF;

If the notification is sent from (H)GMLC to NEF,

- the callback URI of NEF provided by NEF during requesting the ProvideLocation service operation for the periodic or triggered deferred location for a target UE or ;

- the callback URI of NEF locally provisioned in the (H)GMLC.

2a. If the notification is received, the NF Service Consumer shall reply with the status code 204 indicating the notification is received, in the response message.

2b. On failure, one of the HTTP status code listed in Table 6.1.4.2.3.1-2 may be returned. For a 4xx response, the message body may contain a ProblemDetails structure with the "cause" attribute set to one of the application errors listed in Table 6.1.4.2.3.1-2.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 6.1.5.1 General

This clause specifies the application data model supported by the API.

Table 6.1.5.1-1 specifies the data types defined for the Ngmlc\_Location service based interface protocol.

Table 6.1.5.1-1: Ngmlc\_Location specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| InputData | 6.1.5.2.2 | the input parameters in ProvideLocation service operation |  |
| LocationData | 6.1.5.2.3 | the response parameters in ProvideLocation service operation |  |
| CancelLocData | 6.1.5.2.4 | the input parameters in CancelLocation service operation |  |
| LocUpdateData | 6.1.5.2.5 | the input parameters in LocationUpdate service operation |  |
| EventNotifyData | 6.1.5.2.6 | the input parameters in EventNotify Notification service operation |  |
| UePrivacyRequirements | 6.1.5.2.7 | UE privacy requirements from (H)GMLC to the serving AMF or VGMLC(in the roaming case) for the target UE |  |
| LocUpdateNotification | 6.1.5.2.9 | Location Update Notification |  |
| ServiceIdentity | 6.1.5.3.2 | service identity |  |
| CodeWord | 6.1.5.3.2 | codeword |  |
| ExternalClientIdentification | 6.1.5.3.2 | external client identification |  |
| E164CountryCodeOfGeographicArea | 6.1.5.3.2 | E.164 country codes for geographic areas |  |
| PseudonymIndicator | 6.1.5.3.3 | It defines if a pseudonym is requested |  |
| LocationRequestType | 6.1.5.3.4 | NI-LR, MT-LR or MO-LR |  |
| LocationTypeRequested | 6.1.5.3.5 | the location type requested by the LCS client |  |
| EventNotifyDataType | 6.1.5.3.6 | the type of event that triggers event notification |  |

Table 6.1.5.1-2 specifies data types re-used by the Ngmlc\_Location service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Ngmlc\_Location service based interface.

Table 6.1.5.1-2: Ngmlc\_Location re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Gpsi | 3GPP TS 29.571 [11] |  |  |
| Supi | 3GPP TS 29.571 [11] |  |  |
| Uri | 3GPP TS 29.571 [11] |  |  |
| AmfId | 3GPP TS 29.571 [11] |  |  |
| NfInstanceId | 3GPP TS 29.571 [11] |  |  |
| ExternalClientType | 3GPP TS 29.572 [12] |  |  |
| LocationQoS | 3GPP TS 29.572 [12] |  |  |
| LcsQosClass | 3GPP TS 29.572 [12] |  |  |
| SupportedGADShapes | 3GPP TS 29.572 [12] |  |  |
| PeriodicEventInfo | 3GPP TS 29.572 [12] |  |  |
| AreaEventInfo | 3GPP TS 29.572 [12] |  |  |
| MotionEventInfo | 3GPP TS 29.572 [12] |  |  |
| LdrType | 3GPP TS 29.572 [12] |  |  |
| LdrReference | 3GPP TS 29.572 [12] |  |  |
| AgeOfLocationEstimate | 3GPP TS 29.572 [12] |  |  |
| PositioningMethod | 3GPP TS 29.572 [12] |  |  |
| AccuracyFulfilmentIndicator | 3GPP TS 29.572 [12] |  |  |
| LmfIdentification | 3GPP TS 29.572 [12] |  |  |
| LcsServiceType | 3GPP TS 29.572 [12] |  |  |
| VelocityRequested | 3GPP TS 29.572 [12] |  |  |
| LcsPriority | 3GPP TS 29.572 [12] |  |  |
| VelocityEstimate | 3GPP TS 29.572 [12] |  |  |
| TerminationCause | 3GPP TS 29.572 [12] |  |  |
| PositioningMethodAndUsage | 3GPP TS 29.572 [12] |  |  |
| GnssPositioningMethodAndUsage | 3GPP TS 29.572 [12] |  |  |
| LcsServiceAuth | 3GPP TS 29.571 [11] |  |  |
| Ecgi | 3GPP TS 29.571 [11] |  |  |
| Ncgi | 3GPP TS 29.571 [11] |  |  |
| Altitude | 3GPP TS 29.572 [12] | Altitude |  |
| BarometricPressure | 3GPP TS 29.572 [12] | Barometric pressure |  |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 6.1.4.2.2 Notification Definition

Call-back URI: {locationNotificationUri}

See clause 5.2.2.5.1 for the description of how the GMLC obtains the Call-back URI of the NF Service Consumer.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 6.1.5.2.2 Type: InputData

Table 6.1.5.2.2-1: Definition of type InputData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| gpsi | Gpsi | O | 0..1 | Generic Public Subscription Identifier |  |
| supi | Supi | O | 0..1 | Subscription Permanent Identifier |  |
| externalClientType | ExternalClientType | M | 1 | External client type |  |
| locationQoS | LocationQoS | O | 0..1 | Requested location QoS |  |
| supportedGADShapes | array(SupportedGADShapes) | O | 1..N | Supported Geographical Area Description shapes |  |
| serviceIdentity | ServiceIdentity | O | 0..1 | Service identity |  |
| serviceCoverage | array(E164CountryCodeOfGeographicArea) | O | 1..N | A list of E.164 country codes for geographic areas (see ITU Recommendation E.164 [13]) where the LCS client is permitted to request and receive UE location information. |  |
| ldrType | LdrType | C | 0..1 | Location deferred request event type |  |
| periodicEventInfo | PeriodicEventInfo | C | 0..1 | Periodic event information of the location request for a target UE |  |
| areaEventInfo | AreaEventInfo | C | 0..1 | Area event information of the location request for a target UE |  |
| motionEventInfo | MotionEventInfo | C | 0..1 | Motion event information of the location request for a target UE |  |
| ldrReference | LdrReference | C | 0..1 | Notification correlation IDIt shall be present in the request from NEF if it is allocated by NEF for the Deferred 5GC-MT-LR procedure.It shall be present in the request to VGMLC for the Deferred 5GC-MT-LR procedure. |  |
| hgmlcCallBackUri | Uri | O | 0..1 | Notification target address for HGMLC. |  |
| eventNotificationUri | Uri | O | 0..1 | The call-back Uri of NF service consumer (i.e. NEF) for implicit subscription to notification of Eventnotify. |  |
| externalClientIdentification | ExternalClientIdentification | O | 0..1 | External LCS client identification |  |
| afId | string | O | 0..1 | The identification of AF that initiated location request |  |
| uePrivacyRequirements | UePrivacyRequirements | O | 0..1 | UE privacy requirement |  |
| lcsServiceType | LcsServiceType | O | 0..1 | LCS service type |  |
| velocityRequested | VelocityRequested | O | 0..1 | Velocity of the target UE is requested |  |
| priority | LcsPriority | O | 0..1 | Priority of the location request |  |
| locationTypeRequested | LocationTypeRequested | O | 0..1 | Requested type of location, applicable to location immediate request |  |
| maximumAgeOfLocationEstimate | AgeOfLocationEstimate | O | 0..1 | Requested maximum age of the location estimate |  |
| amfId | AmfId | O | 0..1 | The identification of serving AMF |  |
| codeWord | CodeWord | O | 0..1 | Code word |  |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 6.1.5.2.6 Type: EventNotifyData

Table 6.1.5.2.6-1: Definition of type EventNotifyData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| supi | Supi | O | 0..1 | Subscription Permanent Identifier |  |
| gpsi | Gpsi | O | 0..1 | Generic Public Subscription Identitfier |  |
| ldrReference | LdrReference | M | 1 | LDR Reference |  |
| eventNotifyDataType | EventNotifyDataType | M | 1 | The type of event that triggers event notification |  |
| locationEstimate | GeographicArea | O | 0..1 | Geographic area of the target UE |  |
| civicAddress | civicAddress | O | 0..1 | Civic address of the target UE |  |
| ageOfLocationEstimate | AgeOfLocationEstimate | O | 0..1 | Age of location estimate |  |
| positioningDataList | array(PositioningMethodAndUsage) | O | 1..N | If present, this IE shall indicate the usage of each non-GANSS positioning method that was attempted to determine the location estimate, either successfully or unsuccessfully. |  |
| gnssPositioningDataList | array(GnssPositioningMethodAndUsage) | O | 1..N | If present, this IE shall indicate the usage of each GANSS positioning method that was attempted to determine the location estimate, either successfully or unsuccessfully. |  |
| lmfIdentification | LmfIdentification | O | 0..1 | LMF identification that stores the location context of the target UE |  |
| amfId | AmfId | O | 0..1 | The identification of AMF that is serving the target UE |  |
| terminationCause | TerminationCause | C | 0..1 | The IE shall be included if event reporting has been terminated |  |
| velocityEstimate | VelocityEstimate | C | 0..1 | If present, this IE contain an estimate of the velocity of the target UE, composed by horizontal speed, vertical speed, and their respective uncertainty.This IE shall be sent from (V)GMLC to (H)GMLC if received by VGMLC from AMF when roaming. |  |
| altitude | Altitude | C | 0..1 | If present, this IE indicates the altitude of the positioning estimate.This IE shall be sent from (V)GMLC to (H)GMLC if received by VGMLC from AMF when roaming. |  |
| targetNode | NfInstanceId | C | 0..1 | For mobility of a UE with periodic or triggered location, this IE contains the address of the new serving node and shall be sent from (V)GMLC to (H)GMLC if received by VGMLC from AMF when roaming. |  |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 6.1.5.3.6 Enumeration: EventNotifyDataType

The enumeration EventNotifyDataType represents the type of event notification. It shall comply with the provisions defined in table 6.1.5.3.6-1.

Table 6.1.5.3.6-1: Enumeration EventNotifyDataType

|  |  |  |
| --- | --- | --- |
|  Enumeration value  | Description | Applicability |
| "UE\_AVAILABLE" | UE available event |  |
| "PERIODIC" | Periodic event |  |
| "ENTERING\_INTO\_AREA" | Entering area event |  |
| "LEAVING\_FROM\_AREA" | Leaving area event |  |
| "BEING\_INSIDE\_AREA" | Being inside area event |  |
| "MOTION" | Motion event |  |
| "MAXIMUM\_INTERVAL\_EXPIRATION\_EVENT" | Expiration of maximum reporting interval event |  |
| "LOCATION\_CANCELLATION\_EVENT" | Cancellation of location reporting event |  |
| "ACTIVATION\_OF\_DEFERRED\_LOCATION" | A confirmation that periodic or triggered location was successfully activated in the target UE |  |
| "UE\_MOBILITY\_FOR\_DEFERRED\_LOCATION" | Mobility of the target UE to a different NF |  |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## A.2 Ngmlc\_Location API

openapi: 3.0.0

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

paths:

 /provide-location:

 post:

 summary: Request Location of an UE

 operationId: RequestLocation

 tags:

 - Request Location

 requestBody:

 content:

 application/json:

 schema:

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

 required: true

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 '504':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/504'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 callbacks:

 EventNotify:

 '{$request.body#/hgmlcCallBackUri}':

 post:

 requestBody:

 description: UE Event Notification

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: Expected response to a valid notification

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 '504':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/504'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 EventNotifyNef:

 '{$request.body#/eventNotificationUri}':

 post:

 requestBody:

 description: UE Event Notification

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: Expected response to a valid notification

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 '504':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/504'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

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

#

# COMPLEX TYPES

#

 InputData:

 type: object

 required:

 - externalClientType

 properties:

 gpsi:

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

 supi:

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

 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: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/AreaEventInfo'

 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'

 LocationData:

 type: object

 properties:

 gpsi:

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

 supi:

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

 locationEstimate:

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

 civicAddress:

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

 ageOfLocationEstimate:

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

 positioningDataList:

 type: array

 items:

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

 minItems: 1

 gnssPositioningDataList:

 type: array

 items:

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

 minItems: 1

 accuracyFulfilmentIndicator:

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

 ueVelocity:

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

 ldrReference:

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

 CancelLocData:

 type: object

 required:

 - hgmlcCallBackUri

 - ldrReference

 properties:

 gpsi:

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

 supi:

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

 hgmlcCallBackUri:

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

 ldrReference:

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

 lmfIdentification:

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

 amfId:

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

 LocUpdateData:

 type: object

 required:

 - locationRequestType

 - locationEstimate

 - ageOfLocationEstimate

 - accuracyFulfilmentIndicator

 - lcsQosClass

 properties:

 gpsi:

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

 supi:

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

 locationRequestType:

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

 locationEstimate:

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

 ageOfLocationEstimate:

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

 accuracyFulfilmentIndicator:

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

 civicAddress:

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

 lcsQosClass:

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

 externalClientIdentification:

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

 afId:

 type: string

 hgmlcAddress:

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

 serviceIdentity:

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

 EventNotifyData:

 type: object

 required:

 - eventNotifyDataType

 - ldrReference

 properties:

 gpsi:

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

 supi:

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

 ldrReference:

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

 eventNotifyDataType:

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

 locationEstimate:

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

 civicAddress:

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

 ageOfLocationEstimate:

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

 positioningDataList:

 type: array

 items:

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

 minItems: 1

 gnssPositioningDataList:

 type: array

 items:

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

 minItems: 1

 lmfIdentification:

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

 amfId:

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

 terminationCause:

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

 velocityEstimate:

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

 altitude:

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

 targetNode:

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

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

 EventNotifyDataType:

 anyOf:

 - type: string

 enum:

 - UE\_AVAILABLE

 - PERIODIC

 - ENTERING\_INTO\_AREA

 - LEAVING\_FROM\_AREA

 - BEING\_INSIDE\_AREA

 - MOTION

 - MAXIMUM\_INTERVAL\_EXPIRATION\_EVENT

 - LOCATION\_CANCELLATION\_EVENT

 - ACTIVATION\_OF\_DEFERRED\_LOCATION

 - UE\_MOBILITY\_FOR\_DEFERRED\_LOCATION

 - type: string

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*The end of changes\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*