**3GPP TSG-CT WG4 Meeting #101eC4-205**

**E-Meeting, 3rd – 13th November 2020 was C4-205240**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.503** | **CR** | **0515** | **rev** | **1** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | UE Reachability for IP | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | UDICOM | | | | |  | ***Date:*** | | | 2020-11-09 |
|  |  | | | |  | |  | | |  |
| ***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 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | According to 23.632 clause 5.4.5 the HSS may make use of the Nudm\_EE service to subscribe to UE reachability notifications at the UDM. In consequence the UDM subscribes at the AMF(s) asking the AMF to send the reachability notification to the UDM (i.e. not directly to the HSS). In this use case the notification shall be sent when UE reachability is detected by the AMF regardles of any SMSF registration at the UDM. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add reachabilityForSmsConfiguration to type MonitoringConfiguration. This allows the Service Consumer (e.g. HSS) to subscribe to UE reachability for SMS over IP (i.e. not over NAS). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Requirements from 23.632 cannot be met. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.4.6.1, 6.4.6.2.3, 6.4.6.2.4, 6.4.6.3.x (new), A.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 backwards compatible corrections to the Nudm\_EE API | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \* \*

#### 6.4.6.1 General

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

Table 6.4.6.1-1 specifies the data types defined for the Nudm\_EE service API.

Table 6.4.6.1-1: Nudm\_EE specific Data Types

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Data type | | Clause defined | | Description | |
| EeSubscription | | 6.4.6.2.2 | | A subscription to Notifications | |
| MonitoringConfiguration | | 6.4.6.2.3 | | Monitoring Configuration | |
| MonitoringReport | | 6.4.6.2.4 | | Monitoring Report | |
| Report | | 6.4.6.2.5 | |  | |
| ReportingOptions | | 6.4.6.2.6 | |  | |
| ChangeOfSupiPeiAssociationReport | | 6.4.6.2.7 | |  | |
| RoamingStatusReport | | 6.4.6.2.8 | |  | |
| CreatedEeSubscription | | 6.4.6.2.9 | |  | |
| LocationReportingConfiguration | | 6.4.6.2.10 | |  | |
| CnTypeChangeReport | | 6.4.6.2.11 | |  | |
| ReachabilityForSmsReport | | 6.4.6.2.12 | |  | |
| DatalinkReportingConfiguration | | 6.4.6.2.13 | | Reporting configuration for events related to data link | |
| CmInfoReport | | 6.4.6.2.14 | | Reporting UE's Connection Management State information per access type | |
| LossConnectivityCfg | | 6.4.6.2.15 | | Configuration for loss of connectivity event | |
| MaxNumOfReports | | 6.4.6.3.2 | | Maximum number of reports | |
| ReferenceId | | 6.4.6.3.2 | | Reference Identity | |
| EventType | | 6.4.6.3.3 | | Event type of UDM Event Exposure service | |
| LocationAccuracy | | 6.4.6.3.4 | | Location Accuracy definition | |
| CnType | | 6.4.6.3.5 | | Core Network Type | |
| AssociationType | | 6.4.6.3.6 | |  | |
| EventReportMode | | 6.4.6.3.7 | |  | |
| ReachabilityForSmsConfiguration | | 6.4.6.3.x | |  | |

Table 6.4.6.1-2 specifies data types re-used by the Nudm\_EE service API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudm\_EE service API.

Table 6.4.6.1-2: Nudm\_EE re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| Uri | 3GPP TS 29.571 [7] | Uniform Resource Identifier |
| SupportedFeatures | 3GPP TS 29.571 [7] | see 3GPP TS 29.500 [4] clause 6.6 |
| DateTime | 3GPP TS 29.571 [7] |  |
| Pei | 3GPP TS 29.571 [7] |  |
| PlmnId | 3GPP TS 29.571 [7] |  |
| Gpsi | 3GPP TS 29.571 [7] |  |
| AccessType | 3GPP TS 29.571 [7] |  |
| PatchResult | 3GPP TS 29.571 [7] |  |
| DddTrafficDescriptor | 3GPP TS 29.571 [7] |  |
| SamplingRatio | 3GPP TS 29.571 [7] |  |
| DurationSec | 3GPP TS 29.571 [7] |  |
| DlDataDeliveryStatus | 3GPP TS 29.571 [7] | Downlink data delivery status |
| CmInfo | 3GPP TS 29.518 [36] | Describe the Connection Management state information for an access type |

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

##### 6.4.6.2.3 Type: MonitoringConfiguration

Table 6.4.6.2.3-1: Definition of type MonitoringConfiguration

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | | Data type | P | Cardinality | Description |
| eventType | | EventType | M | 1 | String; see clause 6.4.6.3.3 |
| immediateFlag | | boolean | O | 0..1 | Indicates if an immediate event report in the subscription response indicating current value / status of the event is required or not. If the flag is not present then immediate reporting shall not be done. |
| locationReportingConfiguration | | LocationReportingConfiguration | C | 0..1 | shall be present if eventType is "LOCATION\_REPORTING" |
| associationType | | AssociationType | O | 0..1 | If the eventType indicates CHANGE\_OF\_SUPI\_PEI\_ASSOCIATION, this parameter may be included to identify whether the IMSI-IMEI or IMSI-IMEISV association shall be detected.  If the flag is not present, then a value of IMEISV shall be used |
| datalinkReportCfg | | DatalinkReportingConfiguration | C | 0..1 | shall be present if eventType is "DL\_DATA\_DELIVERY\_STATUS"  "AVAILABILITY\_AFTER\_DDN\_FAILURE". |
| lossConnectivityCfg | | LossConnectivityCfg | O | 0..1 | May be present if eventType is "LOSS\_OF\_CONNECTIVITY".  (NOTE) |
| maximumLatency | | DurationSec | O | 0..1 | May be present if eventType is "UE\_REACHABILITY\_FOR\_DATA"  When present, it indicates the configured Maximum Latency.  (NOTE) |
| maximumResponseTime | | DurationSec | O | 0..1 | May be present if eventType is "UE\_REACHABILITY\_FOR\_DATA"  When present, it indicates the configured Maximum Response Time.  (NOTE) |
| suggestedPacketNumDl | | integer | O | 0..1 | May be present if eventType is "UE\_REACHABILITY\_FOR\_DATA"  When present, it indicates the configured Suggested number of downlink packets.  (NOTE) |
| reachabilityForSmsCfg | | ReachabilityForSmsConfiguration | O | 0..1 | REACHABILITY\_FOR\_SMS\_OVER\_NAS (default) or  REACHABILITY\_FOR\_SMS\_OVER\_IP |
| NOTE: Parameters maximumLatency, maximumResponseTime, suggestedPacketNumDl and lossConnectivityCfg are not recommendated to be used for the AFs that support to set them by Parameter Provision service operation via NEF. | | | | | |

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

##### 6.4.6.2.4 Type: MonitoringReport

Table 6.4.6.2.4-1: Definition of type MonitoringReport

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| referenceId | ReferenceId | M | 1 | Shall contain the Reference ID which was provided as the key of the associated monitoring configuration in subscription request. The consumer can use this IE to uniquely associate the report with the corresponding event that was requested to be monitored. |
| eventType | EventType | M | 1 | String; see clause 6.4.6.3.3  only the following values are allowed:  "UE\_REACHABILITY\_FOR\_SMS" "CHANGE\_OF\_SUPI\_PEI\_ASSOCIATION" "ROAMING\_STATUS"  "CN\_TYPE\_CHANGE"  "UE\_CONNECTION\_MANAGEMENT\_STATE" |
| report | Report | C | 0..1 | Shall be present if eventType is "CHANGE\_OF\_SUPI\_PEI\_ASSOCIATION" or "ROAMING\_STATUS"  "CN\_TYPE\_CHANGE"  "UE\_CONNECTION\_MANAGEMENT\_STATE" |
| reachabilityForSmsReport | ReachabilityForSmsReport | C | 0..1 | Should be present if eventType is "UE\_REACHABILITY\_FOR\_SMS" and reachabilityForSmsCfg was absent from the MonitoringConfiguration or indicated REACHABILITY\_FOR\_SMS\_OVER\_NAS |
| gpsi | Gpsi | C | 0..1 | shall be present if the report is associated to exposure subscriptions for a group of UEs or any UE. |
| timeStamp | DateTime | M | 1 | Point in time at which the event occurred |

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

##### 6.4.6.3.x Enumeration: ReachabilityForSmsConfiguration

Table 6.4.6.3.x-1: Enumeration ReachabilityForSmsConfiguration

|  |  |
| --- | --- |
| Enumeration value | Description |
| "REACHABILITY\_FOR\_SMS\_OVER\_NAS" | Indicates that the Monitoring Configuration with Event Type UE\_REACHABILITY\_FOR\_SMS requests a notification when the UE is reachable for SMS via a registered SMSF (default) |
| "REACHABILITY\_FOR\_SMS\_OVER\_IP" | Indicates that the Monitoring Configuration with Event Type UE\_REACHABILITY\_FOR\_SMS requests a notification when the UE is reachable for SMS over IP, i.e. regardless of an SMSF being registered. |

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

## A.5 Nudm\_EE API

openapi: 3.0.0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*text not shown for clarity\*\*\*\*\*\*\*\*\*\*\*\*

MonitoringConfiguration:

type: object

required:

- eventType

properties:

eventType:

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

immediateFlag:

type: boolean

locationReportingConfiguration:

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

associationType:

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

datalinkReportCfg:

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

lossConnectivityCfg:

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

maximumLatency:

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

maximumResponseTime:

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

suggestedPacketNumDl:

type: integer

minimum: 1

reachabilityForSmsCfg:

$ref: '#components/schemas/ReachabilityForSmsConfiguration'

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*text not shown for clarity\*\*\*\*\*\*\*\*\*\*\*\*

# ENUMS:

ReachabilityForSmsConfiguration:

anyOf:

- type: string

enum:

- REACHABILITY\_FOR\_SMS\_OVER\_NAS

- REACHABILITY\_FOR\_SMS\_OVER\_IP

- type: string

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*text not shown for clarity\*\*\*\*\*\*\*\*\*\*\*\*

\* \* \* End of Change \* \* \* \*