**3GPP TSG-CT WG4 Meeting #111-eC4-224216**

**E-Meeting, 18th – 26th August 2022 was C4-223276**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.564** | **CR** | **0002** | **rev** | **1** | **Current version:** | **17.1.0** |  |
|  |
| *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** |

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|  |
| ***Title:***  | QoS Monitoring Report Correlation in AF or NEF |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | eEDGE\_5GC |  | ***Date:*** | 2022-08-03 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | It was agreed at CT4#109 meeting, the UPF will include QFI to enable AF/NEF to correlate the QoS Monitoring Report. However, this implies the AF/NEF has to subscribe the SMF Event for QFI Allocation, possibly via UDM, which results extra signaling. In addition, QFI allocation mechanism is not fully specified, e.g. how AF/NEF can find the SMF serving the PDU session, in the Event Subscription data type as specified in TS29.508, it is not possible to include multiple media components as described by(ethernet) flow description, and in the Event Notification (in TS29.508) only one pair of (ethernet) flow description can be provided. More importantly, Nudm\_ee service seems lack of support for QFI allocation. In fact, there is a simple alternative solution.Since the SMF is required to create a separate QoS flow to transport the packets pertaining to the AF session (as identified by the application id or service data flow(s) filter(s)) according to the PCC rule authorized by the PCF and when the PCC contains QoS Monitoring requirement, so that the SMF will provision Packet Detection Rule(s) generated according to the PCC rule and associate it with QoS Enforcement Rule (QER)(s) where the UPF can learn the QFI(s) (QoS Flow Identifier). At the same time, the SMF will provide Session Reporting Rule to request the UPF to perform QoS Monitoring for the QoS flow(s) as identified by the QFI.Therefore, the UPF can use QFI to derive the PDRs associated with the QFI in the QoS enforcement Rule (QER). So, it is proposed that UPF shall include the application Id, or by ethernet flow description or (IP) flow description which can be derived from the Packet Detection Rule in the NotificationItem to enable AF/NEF to correlate the QoS Monitoring Reports with different service data flows.Rev1: Change Cardinality of appIds, ethfDescs, fDescs from "0..N" to "1..N" as commented at the meeting.At the last CT4 meeting, there was a proposal that the AF may provision an identifier (as string) for a Service Data Flow when establishing an AF session, and this identifier will be all the way populated to the UPF, via NEF/PCF/SMF, so that the UPF can include such identifier in QoS Monitoring Report (in NotificationItem), to help the AF/NEF to find the associated Service Data flow(s). This proposal will enhance the matching process in AF/NEF to find corresponding service data flow for which the QoS Monitoring Report is aiming, the AF could correlate directly with the string identifier that would be newly signalled, however it introduces quite a few changes/impacts on AF/NEF/PCF/SMF and UPF, i.e. N7, N5, N33 and N4 will be impacted. It is proposed to let CT3 to decide whether such optimization is acceptable. |
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| ***Summary of change:*** | To add following attributes in the NotificationItem:- array(ApplicationId)- array(EthFlowDescription)- array(FlowDescription) |
|  |  |
| ***Consequences if not approved:*** | The AF/NEF may not be able to correlate the notification. |
|  |  |
| ***Clauses affected:*** | 2, 6.1.6.1, 6.1.6.2.3, 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 compatible feature to Nupf\_EventExposure API. |
|  |  |
| ***This’CR's revision history:*** |  |

**\*\*\*\*\*\*\***

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

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

[7] 3GPP TR 21.900: "Technical Specification Group working methods".

[8] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

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

[10] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

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

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

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

[14] 3GPP TS 23.548: "5G System Enhancements for Edge Computing; Stage 2".

[15] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane Nodes; Stage 3".

[16] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[xx] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

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

#### 6.1.6.1 General

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

Table 6.1.6.1-1 specifies the data types defined for the Nupf\_EventExposure service.

Table 6.1.6.1-1: Nupf\_EventExposure specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| NotificationData | 6.1.6.2.2 | The list of NotificationItems |  |
| NotificationItem | 6.1.6.2.3 | Represents a report on one subscribed event |  |
| QosMonitoringMeasurement | 6.1.6.2.4 | QoS Monitoring Measurement information |  |
| EventType | 6.1.6.3.3 | Event Type |  |

Table 6.1.6.1-2 specifies data types re-used by the Nupf\_EventExposure service from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nupf\_EventExposure service.

Table 6.1.6.1-2: Nupf\_EventExposure re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| DateTime | 3GPP TS 29.571 [16] | Date time |  |
| Dnn | 3GPP TS 29.571 [16] | DNN |  |
| Gpsi | 3GPP TS 29.571 [16] | GPSI |  |
| Snssai | 3GPP TS 29.571 [16] | S-NSSAI |  |
| Uint32 | 3GPP TS 29.571 [16] | Uint32 |  |
| ApplicationId | 3GPP TS 29.571 [16] | Application ID |  |
| EthFlowDescription | 3GPP TS 29.514 [xx] | The flow description for the Uplink and/or Downlink Ethernet flows. |  |
| FlowDescription | 3GPP TS 29.514 [xx] | The flow description for the Uplink and/or Downlink IP flows. |  |

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

##### 6.1.6.2.3 Type: NotificationItem

Table 6.1.6.2.3-1: Definition of type NotificationItem

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| eventType | EventType | M | 1 | The event type of the event for which the notification is generated. |  |
| appIds | ApplicationId | O | 0..1 | Contains the Application Id which is derived from the Packet Detection Information in the PDR(s) with which the QER (containing the QFI to be monitored) is associated. |  |
| ethfDescs | array(EthFlowDescription) | O | 1..N | Contains the flow description for the Uplink and/or Downlink Ethernet flows which are derived from the Packet Detection Information in the PDR(s) with which the QER (containing the QFI to be monitored) is associated. |  |
| fDescs | array(FlowDescription) | O | 1..N | Contains the flow description for the Uplink and/or Downlink IP flows which are derived from the Packet Detection Information in the PDR(s) with which the QER (containing the QFI to be monitored) is associated. |  |
| ueIpv4Addr | Ipv4Addr | C | 0..1 | IPv4 address of the UE (NOTE 1) |  |
| ueIpv6Prefix | Ipv6Prefix | C | 0..1 | IPv6 address prefix of the UE (NOTE 1) |  |
| dnn | Dnn | O | 0..1 | When present, this attribute indicates the DNN of the PDU session for which the notification is generated. |  |
| snssai | Snssai | O | 0..1 | When present, this attribute indicates the S-NSSAI of the PDU session for which the notification is generated. |  |
| gpsi | Gpsi | O | 0..1 | When present, this attribute indicates the GPSI of the UE for which the notification is generated. |  |
| timeStamp | DateTime | M | 1 | The value represents the UTC time when the information in this report was generated. |  |
| startTime | DateTime | O | 0..1 | When present, this attribute shall provide the timestamp when the information in this report was started |  |
| qosMonitoringMeasurement | QosMonitoringMeasurement | C | 0..1 | This attribute shall be present if eventType is set to "QOS\_MONITORING" |  |
| NOTE 1: At least one of ueIpv4Addr and ueIpv6Prefix shall be present. |

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

## A.2 Nupf\_EventExposure API

\*\*\*\*\*\*\*\* Skipped for Clarity \*\*\*\*\*\*\*\*

 NotificationItem:

 type: object

 required:

 - eventType

 - timeStamp

 anyOf:

 - required: [ ueIpv4Addr ]

 - required: [ ueIpv6Prefix ]

 properties:

 eventType:

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

 appId:

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

 ethfDescs:

 type: array

 items:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/EthFlowDescription'

 minItems: 1 fDescs:

 type: array

 items:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/FlowDescription' minItems: 1

 ueIpv4Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 ueIpv6Prefix:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 dnn:

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

 snssai:

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

 gpsi:

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

 timeStamp:

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

 startTime:

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

 qosMonitoringMeasurement:

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

\*\*\*\*\*\*\*\* Skipped for Clarity \*\*\*\*\*\*\*\*

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