**3GPP TSG-CT3 Meeting #112e C3-205064\_r2**

**E-Meeting, 04th – 13th November 2020**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.591** | **CR** | **0025** | **rev** | **1** | **Current version:** | **16.2.0** |  |
|  |
| *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:***  | Essential corrections and alignments |
|  |  |
| ***Source to WG:*** | Huawei, ZTE |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | SBIProtoc16 |  | ***Date:*** | 2020-10-?? |
|  |  |  |  |  |
| ***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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | The following corrections and alignments are necessary:* "204 No Content" needs to be added as a possible response code in clause 4.2.2.2.3 (Modifying an existing subscription) in order to align with clause 5.1.3.3.3.2 and Table 5.1.3.3.3.2-3.
* The "Resource URI" column of Table 5.1.3.1-1 should contain a "<relative URI below root>" instead of a full resource URI, as per the API TS skeleton provided in TS 29.501.
* The "externalDocs" section of the OpenAPI part needs to be corrected with the right title of the specification.
 |
|  |  |
| ***Summary of change:*** | * Add "204 No Content" as a possible response code in clause 4.2.2.2.3 (Modifying an existing subscription) in order to align with clause 5.1.3.3.3.2 and Table 5.1.3.3.3.2-3.
* Update the "Resource URI" column of Table 5.3.1-1 by replacing the full resource URI with the associated "<relative URI below root>", i.e. by removing the part "{apiRoot}/<apiName>/<apiVersion>".
* Correct the specification title in the "externalDocs" section of the OpenAPI part.
* Additional editorial corrections and improvements.
 |
|  |  |
| ***Consequences if not approved:*** | Necessary corrections are not applied. |
|  |  |
| ***Clauses affected:*** | 2, 3.1, 3.2, 4.2.1.1, 4.2.1.3.1, 4.2.1.3.2, 4.2.2.2.1, 4.2.2.2.2, 4.2.2.2.3, 4.2.2.3.2, 4.2.2.4.1, 4.2.2.4.2, 5.1.3.1, 5.1.3.2.1, 5.1.3.3.1, 5.1.6.2.1, 5.1.6.2.2, 5.1.6.2.7, 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 corrections to the OpenAPI specification file for Nnef\_EventExposure API. |
|  |  |
| ***This CR's revision history:*** | Rev 1: * Merge with C3-205219 (#0027) and hence add the changes to clause 2.
* Update “Clauses affected” by adding clauses 2, 4.2.2.4.1 and 5.1.3.2.1.
 |

\* \* \* Start 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] OpenAPI: "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.

[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 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[15] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

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

[17] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

[18] 3GPP TS 29.517: "5G System;Application Function Event Exposure Service; Stage 3".

[19] 3GPP TS 29.551: "5G System; Packet Flow Description Management Service; Stage 3".

[20] 3GPP TS 29.541: "5G System; Network Exposure (NE) function services for Non-IP Data Delivery (NIDD); Stage 3".

[21] 3GPP TS 29.554: "5G System; Background Data Transfer Policy Control Service; Stage 3".

[22] 3GPP TS 29.523: "5G System; Policy Control Event Exposure Service; Stage 3".

\* \* \* Next changes \* \* \* \*

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

\* \* \* Next changes \* \* \* \*

## 3.2 Symbols

For the purposes of the present document, the following symbols apply:

(None)

\* \* \* Next changes \* \* \* \*

4.2.1.1 Overview

The Nnef\_EventExposure service, as defined in 3GPP TS 23.502 [3], is provided by the Network Exposure Function (NEF).

This service:

- allows NF service consumers to subscribe, modify and unsubscribe for application events; and

- notifies NF service consumers with a corresponding subscription about observed events on the NEF.

The types of observed events applicable for NEF include:

- Service experience;

- UE mobility;

- UE communication; and

- Exceptions.

The target of the event reporting may include one or more UE(s), a group of UEs or any UE (i.e. all UEs). When an event to which the NF service consumer has subscribed occurs, the NEF reports the requested information to the NF service consumer based on the event reporting information definition requested by the NF service consumer.

\* \* \* Next changes \* \* \* \*

##### 4.2.1.3.1 Network Exposure Function (NEF)

The Network Exposure Function (NEF) is a functional element that provides application or user related information to the NF service consumers as defined in this specification.

The NEF allows the NF consumer(s) to (un)subscribe to notifications of monitoring observed event, and sends the notification to the NF consumer(s) when a subscribed event is detected.

\* \* \* Next changes \* \* \* \*

##### 4.2.1.3.2 NF Service Consumers

The known NF service consumers are as follows:

The Network Data Analytics Function (NWDAF):

- supports (un)subscribing to notifications of subscribed event(s) from the NEF;

- supports receiving the notifications of subscribed event(s) from the NEF.

\* \* \* Next changes \* \* \* \*

4.2.2.2.1 General

This service operation is used by an NF service consumer to subscribe to notifications on specified event(s) or modify an existing subscription.

The following are the types of events for which a subscription to notifications can be created:

- Service experience;

- UE mobility;

- UE communication; and

- Exceptions;

The following procedures using the Nnef\_EventExposure\_Subscribe service operation are supported:

- creating a new subscription;

- modifying an existing subscription.

\* \* \* Next changes \* \* \* \*

4.2.2.2.2 Creating a new subscription

Figure 4.2.2.2.2-1 illustrates the creation of a Network Exposure Event Subscription.

****

**Figure 4.2.2.2.2-1: Creation of a subscription**

To subscribe to event notifications, the NF service consumer shall send an HTTP POST request to the NEF with: "{apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/" as request URI as shown in step 1 of figure 4.2.2.2.2-1, and the "NefEventExposureSubsc" data structure as request body.

The "NefEventExposureSubsc" data structure shall include:

- a URI where to receive the requested notifications as "notifUri" attribute; and

- a Notification Correlation Identifier assigned by the NF service consumer for the requested notifications as "notifId" attribute.

- description of subscribed event information as "eventsSubs" attribute by using one or more "NefEventSubs" data;

- conditionally, the description of the event reporting information as "eventsRepInfo" attribute;

The "NefEventSubs" data structure shall include:

- an event to subscribe to as a "event" attribute; and

- event filter information as "eventFilter" attribute associated with the event.

The "eventsRepInfo" attribute may include:

- event notification method (periodic, one time, on event detection) as "notifMethod" attribute;

- Maximum Number of Reports as "maxReportNbr" attribute;

- Monitoring Duration as "monDur" attribute;

- repetition period for periodic reporting as "repPeriod" attribute;

- immediate reporting indication as "immRep" attribute;

- sampling ratio as "sampRatio" attribute; and/or

- group reporting guard time as "grpRepTime" attribute.

If the NEF cannot successfully fulfil the received HTTP POST request due to an internal error or an error in the HTTP POST request, the NEF shall send an HTTP error response as specified in clause 5.1.7.

Upon successful reception of an HTTP POST request with "{apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/" as request URI and "NefEventExposureSubsc" data structure as request body, the NEF shall create a new "Individual Event Exposure Subscription" resource, store the subscription and send an HTTP "201 Created" response, as shown in step 2 of figure 4.2.2.2.2-1. The NEF shall include in the "201 Created" response:

- a Location header field; and

- an "NefEventExposureSubsc" data type in the payload body.

The Location header field shall contain the URI of the created individual application session context resource i.e. "{apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/{subscriptionId}".

The "NefEventExposureSubsc" data type payload body shall contain the representation of the created "Individual Network Exposure Event Subscription".

When the "monDur" attribute is included in the response by the NEF, it represents NEF selected expiry time that is equal or less than the expiry time received in the request.

When the "immRep" attribute is included and sets to "true" in the subscription and the subscribed events are available, the NEF shall include the reports of the events subscribed, if available, in the HTTP POST response.

When the sampling ratio attribute, as "sampRatio", is included in the subscription, the NEF shall select a random subset of UEs among the target UEs according to the sampling ratio and only report the event(s) related to the selected subset of UEs.

When the group reporting guard time, as "grpRepTime" attribute, is included in the subscription, the NEF shall accumulate all the event reports for the target UEs until the group reporting guard time expires. Then, the NEF shall notify the NF service consumer using the Nnef\_EventExposure\_Notify service operation, as described in clause 4.2.2.4.

\* \* \* Next changes \* \* \* \*

4.2.2.2.3 Modifying an existing subscription

Figure 4.2.2.2.3-1 illustrates the modification of an existing subscription.

****

**Figure 4.2.2.2.3-1: Modification of an existing subscription**

To modify an existing subscription to event notifications, the NF service consumer shall send an HTTP PUT request with: "{apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/{subscriptionId}" as request URI, as shown in step 1 of figure 4.2.2.2.3-1, where "{subscriptionId}" is the subscription correlation ID of the existing subscription. The "NefEventExposureSubsc" data structure is included as request body as described in clause 4.2.2.2.2.

NOTE 1: An alternate NF service consumer than the one that requested the generation of the subscription resource can send the PUT request.

NOTE 2: The "notifUri" attribute within the NefEventExposureSubsc data structure can be modified to request that subsequent notifications are sent to a new NF service consumer.

NOTE 3: The "monDur" attribute within the NefEventExposureSubsc data structure can be modified to extend the expiry time to keep receiving notifications.

If the NEF cannot successfully fulfil the received HTTP PUT request due to an internal error or an error in the HTTP PUT request, the NEF shall send an HTTP error response as specified in clause 5.1.7.

Upon successful reception of an HTTP PUT request with: "{apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/{subscriptionId}" as request URI and "NefEventExposureSubsc" data structure as request body, the NEF shall update the subscription and send an HTTP "200 OK" response with the "NefEventExposureSubsc" data structure as response body containing the representation of the modified "Individual Network Exposure Event Subscription", or an HTTP "204 No Content" response, as shown in step 2 of figure 4.2.2.2.3-1.

When the "monDur" attribute is included in the response by the NEF, it represents NEF selected expiry time that is equal or less than the expiry time received in the request.

When the "immRep" attribute is included and sets to "true" in the subscription and the subscribed events are available, the NEF shall include the reports of the events subscribed, if available, in the HTTP PUT response.

When the sampling ratio, as "sampRatio" attribute, is included in the subscription, the NEF shall select a random subset of UEs among the target UEs according to the sampling ratio and only report the event(s) related to the selected subset of UEs.

When the group reporting guard time, as "grpRepTime" attribute, is included in the subscription, the NEF shall accumulate all the event reports for the target UEs until the group reporting guard time expires. Then, the NEF shall notify the NF service consumer using the Nnef\_EventExposure\_Notify service operation, as described in clause 4.2.2.4.

\* \* \* Next changes \* \* \* \*

4.2.2.3.2 Unsubscription from event notifications

Figure 4.2.2.3.2-1 illustrates the unsubscription from event notifications.

****

**Figure 4.2.2.3.2-1: Unsubscription from event notifications**

To unsubscribe from event notifications, the NF service consumer shall send an HTTP DELETE request with "{apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/{subscriptionId}" as request URI, as shown in step 1 of figure 4.2.2.3.2-1, where "{subscriptionId}" is the subscription correlation identifier of the existing subscription resource that is to be deleted.

If the NEF cannot successfully fulfil the received HTTP DELETE request due to an internal error or an error in the HTTP DELETE request, the NEF shall send an HTTP error response as specified in clause 6.1.7.

Upon successful reception of an HTTP DELETE request with: "{apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/{subscriptionId}" as request URI, the NEF shall remove the corresponding subscription and send an HTTP "204 No Content" response, as shown in step 2 of figure 4.2.2.3.2-1.

\* \* \* Next changes \* \* \* \*

4.2.2.4.1 General

The Nnef\_EventExposure\_Notify service operation enables the NEF to notify the NF service consumer(s) that the previously subscribed application related event occurred.

The following procedure using the Nnef\_EventExposure\_Notify service operation is supported:

- notification about subscribed events.

\* \* \* Next changes \* \* \* \*

4.2.2.4.2 Notification about subscribed events

Figure 4.2.2.4.2-1 illustrates the notification about subscribed events.

****

**Figure 4.2.2.4.2-1: Notification about subscribed events**

If the NEF observes application related event(s) for which an NF service consumer has subscribed, the NEF shall send an HTTP POST request as shown in step 1 of figure 4.2.2.4.2-1, with the "{notifUri}" as request URI containing the value previously provided by the NF service consumer within the corresponding subscription, and the "NefEventExposureNotif" data structure.

The "NefEventExposureNotif" data structure shall include:

- notification correlation ID provided by the NF service consumer during the subscription as "notifId" attribute; and

- information about the observed event(s) within the "eventNotifs" attribute that shall contain for each observed event an "NefEventNotification" data structure that shall include:

- the application related event as "event" attribute;

- the time at which the event was observed encoded as "timeStamp" attribute;

- if the "event" attribute is "SVC\_EXPERIENCE", service experience information about the application involved in the reported event in the "svcExprcInfos" attribute;

- if the "event" attribute is "UE\_MOBILITY", UE mobility information assoicated with the application as "ueMobilityInfos" attribute;

- if the "event" attribute is "UE\_COMM", UE communication information assoicated with the application as "ueCommInfos" attribute; and

- if the "event" attribute is "EXCEPTIONS", exceptions information associated with a service flow as "excepInfos" attribute.

If the NF service consumer cannot successfully fulfil the received HTTP POST request due to an internal error or an error in the HTTP POST request, the NF service consumer shall send an HTTP error response as specified in clause 5.1.7.

Upon successful reception of an HTTP POST request with "{notifUri}" as request URI and "NefEventExposureNotif" data structure as request body, the NF service consumer shall send an HTTP "204 No Content" response, as shown in step 2 of figure 4.2.2.4.2-1, in case of a successful processing.

\* \* \* Next changes \* \* \* \*

5.1.3.1 Overview

****

**Figure 5.1.3.1-1: Resource URI structure of the Nnef\_EventExposure API**

Table 5.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

**Table 5.1.3.1-1: Resources and methods overview**

|  |  |  |  |
| --- | --- | --- | --- |
| **Resource name** | **Resource URI** | **HTTP method or custom operation** | **Description** |
| Network Exposure Event Subscriptions | /subscriptions | POST | Creates a subscription to notifications on application or user relatedevent(s), i.e. creation of an Individual Network Exposure Event Subscription resource. |
| Individual Network Exposure Event Subscription | /subscriptions/{subscriptionId} | GET | Reads an Individual Network Exposure Event Subscription resource. |
| PUT | Modifies an Individual Network Exposure Event Subscription. |
| DELETE | Cancels an individual subscription to notifications of subscribed event. |

\* \* \* Next changes \* \* \* \*

##### 5.1.3.2.1 Description

The resource represents the collection of Network Exposure Event subscriptions of the Nnef\_EventExposure service. It allows NF service consumers to create a new subscription to notifications on application or user related event(s).

\* \* \* Next changes \* \* \* \*

##### 5.1.3.3.1 Description

The resource represents an individual Network Exposure Event subscription of the Nnef\_EventExposure service. It allows NF service consumers to read/modify/cancel a subscription to notifications on application or user related event(s).

\* \* \* Next changes \* \* \* \*

##### 5.1.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

\* \* \* Next changes \* \* \* \*

##### 5.1.6.2.2 Type: NefEventExposureSubsc

Table 5.1.6.2.2-1: Definition of type NefEventExposureSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| eventsSubs | array(NefEventSubs) | M | 1..N | Subscribed events and the related event filters.  |  |
| eventsRepInfo | ReportingInformation | C | 0..1 | Represents the reporting requirements of the subscription.If omitted, the default values within the ReportingInformationdata type apply. |  |
| notifUri | Uri | M | 1 | Notification URI for event reporting. |  |
| eventNotifs | array(NefEventNotification) | C | 1..N | Represents the Events to be reported.Shall only be present if the immediate reporting indication in the "immRep" attribute within the "eventsRepInfo" attribute sets to true in the event subscription, and the reports are available. |  |
| notifId | string | M | 1 | Notification Correlation ID assigned by the NF service consumer. |  |
| suppFeat | SupportedFeatures | C | 0..1 | This IE represents a list of Supported features used as described in clause 5.8. Shall be present in the HTTP POST request/response; or in the HTTP GET response if the "supp-feat" attribute query parameter is included in the HTTP GET request. (NOTE) |  |
| NOTE: In the HTTP POST request it represents the set of NF service consumer supported features. In the HTTP POST and GET responses it represents the set of features supported by both the NF service consumer and the NEF. |

\* \* \* Next changes \* \* \* \*

##### 5.1.6.2.7 Type NefEventFilter

Table 5.1.6.2.7-1: Definition of type NefEventFilter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| tgtUe | TargetUeIdentification | M | 1 | Represents the UE information to which the request applies. | (NOTE 1) |
| appIds | array(ApplicationId) | C | 1..N | Each element indicates an application identifier.If absent, the NefEventFilter data applies to any application (i.e. all applications).(NOTE 2) | ServiceExperienceExceptionsUeCommunication UeMobility |
| locArea | NetworkAreaInfo | O | 0..1 | Represents an area of interest. | ServiceExperienceExceptions UeCommunicationUeMobility |
| NOTE 1: Applicability is further described in the corresponding data type. NOTE 2: For the events "EXCEPTIONS", "UE\_MOBILITY" and "UE\_COMM", if present, the "appIds" attribute shall include only one element. |

\* \* \* Next changes \* \* \* \*

A.2 Nnef\_EventExposure API

openapi: 3.0.0

info:

 title: Nnef\_EventExposure

 version: 1.0.1

 description: |

 NEF Event Exposure Service.

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externalDocs:

 description: 3GPP TS 29.591 V16.2.0; 5G System; Network Exposure Function Southbound Services; Stage 3.

 url: http://www.3gpp.org/ftp/Specs/archive/29\_series/29.591/

servers:

 - url: '{apiRoot}/nnef-eventexposure/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:

 - {}

 - oAuth2ClientCredentials:

 - nnef-eventexposure

paths:

 /subscriptions:

 post:

 summary: subscribe to notifications

 operationId: CreateIndividualSubcription

 tags:

 - Subscriptions (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Success

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the newly created resource, according to the structure: {apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/{subscriptionId}'

 required: true

 schema:

 type: string

 '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'

 default:

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

 callbacks:

 myNotification:

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

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: No Content, Notification was succesfull

 '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'

 default:

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

 /subscriptions/{subscriptionId}:

 get:

 summary: retrieve subscription

 operationId: GetIndividualSubcription

 tags:

 - IndividualSubscription (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: Event Subscription ID

 required: true

 schema:

 type: string

 - name: supp-feat

 in: query

 description: Features supported by the NF service consumer

 required: false

 schema:

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

 responses:

 '200':

 description: OK. Resource representation is returned

 content:

 application/json:

 schema:

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

 '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'

 '406':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/406'

 '429':

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

 '500':

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

 '503':

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

 default:

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

 put:

 summary: update subscription

 operationId: ReplaceIndividualSubcription

 tags:

 - IndividualSubscription (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: subscriptionId

 in: path

 description: Event Subscription ID

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK. Resource was succesfully modified and representation is returned

 content:

 application/json:

 schema:

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

 '204':

 description: No Content. Resource was succesfully modified

 '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'

 default:

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

 delete:

 summary: unsubscribe from notifications

 operationId: DeleteIndividualSubcription

 tags:

 - IndividualSubscription (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: Event Subscription ID

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content. Resource was succesfully deleted

 '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'

 '429':

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

 '500':

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

 '503':

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

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 nnef-eventexposure: Access to the Nnef\_EventExposure API

 schemas:

 NefEventExposureSubsc:

 type: object

 properties:

 eventsSubs:

 type: array

 items:

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

 minItems: 1

 eventsRepInfo:

 $ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/ReportingInformation'

 notifUri:

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

 notifId:

 type: string

 eventNotifs:

 type: array

 items:

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

 minItems: 1

 suppFeat:

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

 required:

 - eventsSubs

 - notifId

 - notifUri

 NefEventExposureNotif:

 type: object

 properties:

 notifId:

 type: string

 eventNotifs:

 type: array

 items:

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

 minItems: 1

 required:

 - notifId

 - eventNotifs

 NefEventNotification:

 type: object

 properties:

 event:

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

 timeStamp:

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

 svcExprcInfos:

 type: array

 items:

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

 minItems: 1

 ueMobilityInfos:

 type: array

 items:

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

 minItems: 1

 ueCommInfos:

 type: array

 items:

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

 minItems: 1

 excepInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/ExceptionInfo'

 minItems: 1

 required:

 - event

 - timeStamp

 NefEventSubs:

 type: object

 properties:

 event:

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

 eventFilter:

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

 required:

 - event

 NefEventFilter:

 type: object

 properties:

 tgtUe:

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

 appIds:

 type: array

 items:

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

 minItems: 1

 locArea:

 $ref: 'TS29554\_Npcf\_BDTPolicyControl.yaml#/components/schemas/NetworkAreaInfo'

 required:

 - tgtUe

 TargetUeIdentification:

 type: object

 properties:

 supis:

 type: array

 items:

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

 minItems: 1

 interGroupIds:

 type: array

 items:

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

 minItems: 1

 anyUeId:

 type: boolean

 ServiceExperienceInfo:

 type: object

 properties:

 appId:

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

 supis:

 type: array

 items:

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

 minItems: 1

 svcExpPerFlows:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/ServiceExperienceInfoPerFlow'

 minItems: 1

 required:

 - svcExpPerFlows

 UeMobilityInfo:

 type: object

 properties:

 supi:

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

 appId:

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

 ueTrajs:

 type: array

 items:

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

 minItems: 1

 required:

 - supi

 - ueTrajs

 UeCommunicationInfo:

 type: object

 properties:

 supi:

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

 interGroupId:

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

 appId:

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

 comms:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/CommunicationCollection'

 minItems: 1

 required:

 - comms

 UeTrajectoryInfo:

 type: object

 properties:

 ts:

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

 location:

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

 required:

 - ts

 - location

# Simple data types and Enumerations

 NefEvent:

 anyOf:

 - type: string

 enum:

 - SVC\_EXPERIENCE

 - UE\_MOBILITY

 - UE\_COMM

 - EXCEPTIONS

 - type: string

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