**3GPP TSG-CT3 Meeting #115-e *C3-212128r1***

**Online, , 14th Apr 2021 - 23rd Apr 2021**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.523** | **CR** | **0047** | **rev** | **-** | **Current version:** | **17.2.0** |  |
|  |
| *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:***  | Partitioning criteria for applying sampling in specific UE partitions in PCF exposure |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | C3 |
|  |  |
| ***Work item code:*** | eNA\_Ph2 |  | ***Date:*** | 2021-04-07 |
|  |  |  |  |  |
| ***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:*** | Partitioning criteria for partitioning UEs before applying a sampling ratio when sampling-based event exposure is performed have been introduced in TS 23.502 clause 4.15.1. |
|  |  |
| ***Summary of change:*** | Added partitioning criteria in the ReportingInformation defined for PCF event exposure (note that the list of the possible partitioning criteria and their semantics shall be defined in the common data types in 29.571, see related CT4 CR). |
|  |  |
| ***Consequences if not approved:*** | Partitioning before sampling as required by stage 2 specifications cannot be implemented. |
|  |  |
| ***Clauses affected:*** | 4.2.2.2, 4.2.2.3, 5.6.1, 5.6.2.4, 5.8, A.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 29.571 CR 0271 (C4-212286)  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** | This CR introduces a backwards compatible feature to the OpenAPI file. |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* \* First change \* \* \* \*

#### 4.2.2.2 Creating a new subscription

Figure 4.2.2.2-1 illustrates the creation of a subscription.



Figure 4.2.2.2-1: Creation of a subscription

To subscribe to event notifications, the NF service consumer shall send an HTTP POST request with: "{apiRoot}/npcf-eventexposure/v1/subscriptions/" as request URI as shown in figure 4.2.2.2-1, step 1, and the "PcEventExposureSubsc" data structure as request body.

The "PcEventExposureSubsc" data structure shall include:

- identification of the policy events to subscribe as "eventSubs" attribute;

- indication of the UEs to which the subscription applies via:

a) identification of a group of UE(s) via a "groupId" attribute; or

b) identification of any UE by ommitting the "groupId" attribute.

- 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.

The "PcEventExposureSubsc" data structure may also include:

- description of the event reporting information as "eventsRepInfo", which may include:

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

b) Maximum Number of Reports as "maxReportNbr" attribute;

c) Monitoring Duration as "monDur" attribute;

d) repetition period for periodic reporting as "repPeriod" attribute;

e) immediate reporting indication as "immRep" attribute;

f) sampling ratio as "sampRatio" attribute;

g) group reporting guard time as "grpRepTime" attribute; and/or

h) partitioning criteria for partitioning the UEs before performing sampling as "partitionCriteria" attribute if the EneNA feature is supported.

- if the supported feature "ExtendedSessionInformation" is supported, to filter the AF sessions for which the policy event report shall occur, the identification of the services one or more AF sessions may belong to as "filterServices" attribute, which may include per service identification:

a) a list of ethernet flows in the "servEthFlows" attribute; or

b) a list of IP flows in the "servIpFlows" attribute; and/or

c) an AF application identifier in the "afAppId" attribute.

- to filter the DNNs for which the policy event report shall occur, the identification of the DNNs in the "filterDnns" attribute; and

- to filter the S-NSSAIs for which the policy event report shall occur, the identification of the S-NSSAIs in the "filterSnssais" attribute.

If the PCF cannot successfully fulfil the received HTTP POST request due to an internal PCF error or an error in the HTTP POST request, the PCF shall send an HTTP error response as specified in subclause 5.7.

Upon successful reception of the HTTP POST request with "{apiRoot}/npcf-eventexposure/v1/subscriptions/" as request URI and "PcEventExposureSubsc" data structure as request body, the PCF shall create a new "Individual Policy Events Subscription" resource, store the subscription and send a HTTP "201 Created" response as shown in figure 4.2.2.2-1, step 2. The PCF shall include in the "201 Created" response:

- a Location header field; and

- an "PcEventExposureSubsc" 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}/npcf-eventexposure/v1/subscriptions/{subscriptionId}".

The "PcEventExposureSubsc" data type payload body shall contain the representation of the created "Individual Policy Events Subscription".

When the "monDur" attribute is included in the response, it represents a server selected expiry time that is equal or less than a possible expiry time in the request.

When the "immRep" attribute is included in the subscription and the subscribed policy control events are available, the PCF shall immediately notify the NF service consumer using the Npcf\_EventExposure\_Notify service operation, as described in subclause 4.2.4.2.

When the sampling ratio as the "sampRatio" attribute is included in the subscription without a "partitionCriteria" attribute, the PCF 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. If the "partitionCriteria" attribute is additionally included, then the PCF shall first partition the UEs according to the value of the "partitionCriteria" attribute and then select a random subset of UEs from each partition according to the sampling ratio and only report the event(s) related to the selected subsets of UEs.

When the group reporting guard time as the "grpRepTime" attribute is included in the subscription, the PCF shall accumulate all the event reports for the target UEs until the group reporting guard time expires. Then the PCF shall notify the NF service consumer using the Npcf\_EventExposure\_Notify service operation, as described in subclause 4.2.4.2.

\* \* \* \* Second change \* \* \* \*

#### 4.2.2.3 Modifying an existing subscription

Figure 4.2.2.3-1 illustrates the modification of an existing subscription.



Figure 4.2.2.3-1: 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}/npcf-eventexposure/v1/subscriptions/{subscriptionId}" as request URI, as shown in figure 4.2.2.3-1, step 1, where "{subscriptionId}" is the subscription correlation ID of the existing subscription. The "PcEventExposureSubsc" data structure is included as request body as described in subclause 4.2.2.2.

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

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

If the PCF cannot successfully fulfil the received HTTP PUT request due to an internal PCF error or an error in the HTTP PUT request, the PCF shall send an HTTP error response or, if the feature "ES3XX" is supported, an HTTP redirect response as specified in subclause 5.7.

Upon successful reception of an HTTP PUT request with: "{apiRoot}/npcf-eventexposure/v1/subscriptions/{subscriptionId}" as request URI and "PcEventExposureSubsc" data structure as request body, the PCF shall store the subscription and send an HTTP "200 OK" response with the "PcEventExposureSubsc" data structure as response body or an HTTP "204 No Content" response, as shown in figure 4.2.2.3-1, step 2.

The "PcEventExposureSubsc" data structure payload body shall contain the representation of the modified "Individual Policy Events Subscription".

When the "monDur" attribute is included in the response, it represents a NF service producer selected expiry time that is equal or less than a possible expiry time received in the request.

When the "immRep" attribute is included in the updated subscription and the subscribed policy control events are available, the PCF shall immediately notify the NF service consumer using the Npcf\_EventExposure\_Notify service operation, as described in subclause 4.2.4.2.

When the sampling ratio as the "sampRatio" attribute is included in the subscription without a "partitionCriteria" attribute, the PCF 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. If the "partitionCriteria" attribute is additionally included, then the PCF shall first partition the UEs according to the value of the "partitionCriteria" attribute and then select a random subset of UEs from each partition according to the sampling ratio and only report the event(s) related to the selected subsets of UEs.

When the group reporting guard time as the "grpRepTime" attribute is included in the subscription, the PCF shall accumulate all the event reports for the target UEs until the group reporting guard time expires. Then the PCF shall notify the NF service consumer using the Npcf\_EventExposure\_Notify service operation, as described in subclause 4.2.4.2.

\* \* \* \* Third change \* \* \* \*

### 5.6.1 General

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

Table 5.6.1-1 specifies the data types defined for the Npcf\_EventExposure service based interface protocol.

Table 5.6.1-1: Npcf\_EventExposure specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| EthernetFlowInfo | 5.6.2.6 | Identification of an UL/DL ethernet flow. | ExtendedSessionInformation |
| IpFlowInfo | 5.6.2.7 | Identification of an UL/DL IP flow. | ExtendedSessionInformation |
| PcEvent | 5.6.3.3 | Policy Control Events. |  |
| PcEventExposureSubsc | 5.6.2.2 | Represents an Individual Policy Events Subscription resource. |  |
| PcEventExposureNotif | 5.6.2.3 | Describes notifications about Policy Control events that occurred in an Individual Policy Events Subscription resource. |  |
| PcEventNotification | 5.6.2.8 | Represents the information reported for a Policy Control event. |  |
| PduSessionInformation | 5.6.2.9 | Represents PDU session identification information. | ExtendedSessionInformation |
| ReportingInformation | 5.6.2.4 | Represents the type of reporting the subscription requires. |  |
| ServiceIdentification | 5.6.2.5 | Identification of the service to which the subscription applies. | ExtendedSessionInformation |
| SnssaiDnnCombination | 5.6.2.10 | Represents a combination of S-NSSAI and DNN(s). |  |

Table 5.6.1-2 specifies data types re-used by the Npcf\_EventExposure 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 Npcf\_EventExposure service based interface.

Table 5.6.1-2: Npcf\_EventExposure re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AccessType | 3GPP TS 29.571 [14] | Access Type. |  |
| AdditionalAccessInfo | 3GPP TS 29.512 [9] | Indicates the combination of additional Access Type and RAT Type for MA PDU session | ATSSS |
| AfAppId | 3GPP TS 29.514 [12] | AF application Identifier. | ExtendedSessionInformation |
| AnGwAddress | 3GPP TS 29.514 [12] | Carries the control plane address of the EPC untrusted non-3GPP access network gateway. (NOTE 1) |  |
| DateTime | 3GPP TS 29.571 [14] | Time stamp. |  |
| Dnn | 3GPP TS 29.571 [14] | Identifies a DNN. |  |
| DurationSec | 3GPP TS 29.571 [14] | Seconds of duration. |  |
| EthFlowDescription | 3GPP TS 29.514 [12] | Identifies an ethernet flow description. (NOTE 2) | ExtendedSessionInformation |
| FlowDescription | 3GPP TS 29.514 [12] | Identifies an IP flow description. | ExtendedSessionInformation |
| Gpsi | 3GPP TS 29.571 [14] | Generic Public Subscription Identifier. |  |
| GroupId | 3GPP TS 29.571 [14] | Identifies a group of UEs. |  |
| MacAddr48 | 3GPP TS 29.571 [14] | Mac Address of the UE. | ExtendedSessionInformation |
| NotificationMethod | 3GPP TS 29.508 [15] | Represents the Notification Method. |  |
| PartitioningCriteria | 3GPP TS 29.571 [14] | Used to partition UEs before applying sampling. | EneNA |
| PlmnIdNid | 3GPP TS 29.571 [14] | Identifies the network: the PLMN Identifier and, for an SNPN, also the NID. |  |
| RatType | 3GPP TS 29.571 [14] | RAT Type. |  |
| SamplingRatio | 3GPP TS 29.571 [14] | Sampling Ratio. |  |
| Snssai | 3GPP TS 29.571 [14] | Identifies a S-NSSAI |  |
| Supi | 3GPP TS 29.571 [14] | Identifies the SUPI of the UE. |  |
| SupportedFeatures | 3GPP TS 29.571 [14] | Used to negotiate the applicability of the optional features defined in subclause 5.8. |  |
| Uinteger | 3GPP TS 29.571 [14] | Unsigned integer. |  |
| NOTE 1: "AnGwAddress" data structure is only used to encode the ePDG address and is only applicable to the 5GS and EPC/E-UTRAN interworking scenario as defined in 3GPP TS 29.512 [9], Annex B.NOTE 2: In order to support a set of MAC addresses with a specific range in the traffic filter, feature MacAddressRange as specified in clause 5.8 shall be supported. |

\* \* \* \* Fourth change \* \* \* \*

#### 5.6.2.4 Type ReportingInformation

Table 5.6.2.4-1: Definition of type ReportingInformation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| immRep | boolean | O | 0..1 | Indication of immediate reporting. If included, when it is set to true it indicates immediate reporting of the subscribed events, if available. Otherwise, reporting will occur when the event is met. |  |
| notifMethod | NotificationMethod | O | 0..1 | Represents the notification method (periodic, one time, on event detection). If "notifMethod" attribute is not supplied, the default value "ON\_EVENT\_DETECTION" applies. |  |
| maxReportNbr | Uinteger | O | 0..1 | Represents the maximum number of reports, after which the subscription ceases to exist (i.e., the reporting ends). It may be present for the "PERIODIC" and on "ON\_EVENT\_DETECTION" notification methods. If omitted, there is no limit. |  |
| monDur | DateTime | C | 0..1 | Represents the time at which the subscription ceases to exist (i.e the subscription becomes invalid and the reporting ends). If omitted, there is no time limit. If present in the subscription request, it shall be present in the subscription response. |  |
| repPeriod | DurationSec | O | 0..1 | Indicates the time interval between successive event notifications.It is supplied for notification method "PERIODIC". |  |
| sampRatio | SamplingRatio | O | 0..1 | Indicates the ratio of the random subset to target UEs, event reports only relates to the subset. |  |
| partitionCriteria | array(PartitioningCriteria) | O | 0..1 | Defines criteria for partitioning the UEs in order to apply the sampling ratio for each partition. It may only be included in event subscription requests when the "sampRatio" attribute is also provided. | EneNA |
| grpRepTime | DurationSec | O | 0..1 | Indicates the time during which the event reports detected for the concerned UEs are aggregated in a group, in order to be reported together to the NF service consumer. |  |

\* \* \* \* Fifth change \* \* \* \*

## 5.8 Feature negotiation

The optional features in table 5.8-1 are defined for the Npcf\_EventExposure API. They shall be negotiated using the extensibility mechanism defined in subclause 6.6 of 3GPP TS 29.500 [5].

Table 5.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | ExtendedSessionInformation | Indicates the support of additional session information in the subscription and report of policy control event. |
| 2 | MacAddressRange | Indicates the support of a set of MAC addresses with a specific range in the traffic filter. |
| 3 | ATSSS | Indicates the support of the report of the multiple access types of a MA PDU session. |
| 4 | ES3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation, according to Stateless NF procedures as specified in subclauses 6.5.3.2 and 6.5.3.3 of 3GPP TS 29.500 [5] and according to HTTP redirection principles for indirect communication, as specified in subclause 6.10.9 of 3GPP TS 29.500 [5].  |
| x | EneNA | This feature indicates support for the enhancements of network data analytics requirements. |

\* \* \* \* Sixth change \* \* \* \*

# A.2 Npcf\_EventExposure API

openapi: 3.0.0

info:

 version: 1.2.0-alpha.2

 title: Npcf\_EventExposure

 description: |

 PCF Event Exposure Service.

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externalDocs:

 description: 3GPP TS 29.523 V17.2.0; 5G System; Policy Control Event Exposure Service; Stage 3.

 url: http://www.3gpp.org/ftp/Specs/archive/29\_series/29.523/

servers:

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

 variables:

 apiRoot:

 default: https://example.com

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

security:

 - {}

 - oAuth2ClientCredentials:

 - npcf-eventexposure

paths:

 /subscriptions:

 post:

 summary: Creates a new Individual Policy Control Events Subscription resource

 operationId: PostPcEventExposureSubsc

 tags:

 - Policy Control Events Subscription (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Success

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the created individual policy control events subscription resource, according to the structure: {apiRoot}/npcf-eventexposure/v1/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:

 PcEventNotification:

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

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: No Content, Notification was succesfull

 '307':

 description: Temporary Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 required: true

 description: 'A URI pointing to the endpoint of an alternative NF consumer (service) instance towards which the notification should be redirected.'

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance ID towards which the notification request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 required: true

 description: ' A URI pointing to the endpoint of an alternative NF consumer (service) instance towards which the notification should be redirected.'

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance ID towards which the notification request is redirected'

 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'

 /subscriptions/{subscriptionId}:

 get:

 summary: "Reads an existing Individual Policy Control Events Subscription"

 operationId: GetPcEventExposureSubsc

 tags:

 - Individual Policy Control Events Subscription (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: Policy Control Event Subscription ID

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK. Resource representation is returned

 content:

 application/json:

 schema:

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

 '307':

 description: Temporary Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance ID towards which the request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance ID towards which the request is redirected'

 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'

 '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: "Modifies an existing Individual Policy Control Events Subscription "

 operationId: PutPcEventExposureSubsc

 tags:

 - Individual Policy Control Events Subscription (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: subscriptionId

 in: path

 description: Policy Control 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/PcEventExposureSubsc'

 '204':

 description: No Content. Resource was succesfully modified

 '307':

 description: Temporary Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance ID towards which the request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance ID towards which the request is redirected'

 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'

 delete:

 summary: "Cancels an existing Individual Policy Control Events Subscription "

 operationId: DeletePcEventExposureSubsc

 tags:

 - Individual Policy Control Events Subscription (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: Policy Control Event Subscription ID

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content. Resource was succesfully deleted

 '307':

 description: Temporary Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance ID towards which the request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance ID towards which the request is redirected'

 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'

 '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:

 npcf-eventexposure: Access to the Npcf\_EventExposure API.

 schemas:

 PcEventExposureNotif:

 description: Represents notifications about Policy Control events related to an Individual Policy Events Subscription resource.

 type: object

 properties:

 notifId:

 type: string

 eventNotifs:

 type: array

 items:

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

 minItems: 1

 required:

 - notifId

 - eventNotifs

 PcEventExposureSubsc:

 description: Represents an Individual Policy Events Subscription resource.

 type: object

 properties:

 eventSubs:

 type: array

 items:

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

 minItems: 1

 eventsRepInfo:

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

 groupId:

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

 filterDnns:

 type: array

 items:

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

 minItems: 1

 filterSnssais:

 type: array

 items:

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

 minItems: 1

 snssaiDnns:

 type: array

 items:

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

 minItems: 1

 filterServices:

 type: array

 items:

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

 minItems: 1

 notifUri:

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

 notifId:

 type: string

 suppFeat:

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

 required:

 - eventSubs

 - notifId

 - notifUri

 ReportingInformation:

 description: Represents the type of reporting that the subscription requires.

 type: object

 properties:

 immRep:

 type: boolean

 notifMethod:

 $ref: 'TS29508\_Nsmf\_EventExposure.yaml#/components/schemas/NotificationMethod'

 maxReportNbr:

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

 monDur:

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

 repPeriod:

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

 sampRatio:

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

 partitionCriteria:

 type: array

 items:

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

 minItems: 1

 description: Criteria for partitioning the UEs before applying the sampling ratio.

 grpRepTime:

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

 ServiceIdentification:

 description: Identifies the service to which the subscription applies.

 type: object

 properties:

 servEthFlows:

 type: array

 items:

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

 minItems: 1

 servIpFlows:

 type: array

 items:

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

 minItems: 1

 afAppId:

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

 # All conditions in allOf must be met

 allOf:

 # First condition is that servEthFlows and servIpFlows are mutually exclusive

 - not:

 required: [servEthFlows, servIpFlows]

 # Second condition is that at least one the servEthFlows, servIpFlows and afAppId shall be present

 - anyOf:

 - required: [servEthFlows]

 - required: [servIpFlows]

 - required: [afAppId]

 EthernetFlowInfo:

 description: Identifies an UL/DL ethernet flow.

 type: object

 properties:

 ethFlows:

 type: array

 items:

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

 minItems: 1

 maxItems: 2

 flowNumber:

 type: integer

 required:

 - flowNumber

 IpFlowInfo:

 description: Identifies an UL/DL IP flow.

 type: object

 properties:

 ipFlows:

 type: array

 items:

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

 minItems: 1

 maxItems: 2

 flowNumber:

 type: integer

 required:

 - flowNumber

 PcEventNotification:

 description: Represents the information reported for a Policy Control event.

 type: object

 properties:

 event:

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

 accType:

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

 addAccessInfo:

 $ref: 'TS29512\_Npcf\_SMPolicyControl.yaml#/components/schemas/AdditionalAccessInfo'

 relAccessInfo:

 $ref: 'TS29512\_Npcf\_SMPolicyControl.yaml#/components/schemas/AdditionalAccessInfo'

 anGwAddr:

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

 ratType:

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

 plmnId:

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

 supi:

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

 gpsi:

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

 timeStamp:

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

 pduSessionInfo:

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

 repServices:

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

 required:

 - event

 - timeStamp

 PduSessionInformation:

 description: Represents PDU session identification information.

 type: object

 properties:

 snssai:

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

 dnn:

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

 ueIpv4:

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

 ueIpv6:

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

 ipDomain:

 type: string

 ueMac:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 required:

 - snssai

 - dnn

 oneOf:

 - required: [ueMac]

 - anyOf:

 - required: [ueIpv4]

 - required: [ueIpv6]

 SnssaiDnnCombination:

 description: Represents a combination of S-NSSAI and DNN(s).

 type: object

 properties:

 snssai:

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

 dnns:

 type: array

 items:

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

 minItems: 1

# Simple data types and Enumerations

 PcEvent:

 description: Represents the policy control events that can be subscribed.

 anyOf:

 - type: string

 enum:

 - AC\_TY\_CH

 - PLMN\_CH

 - type: string

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