**3GPP TSG- Meeting #**

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *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:*** | Implementing required AF event filters | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNetAE | | | | |  | ***Date:*** | | | 2023-04-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The current filters for Collective Behaviour cannot be used to fulfil the stage 2 requirements because the unspecified "string" to be used to contain the value of the filters is not usable, while the requirement to be able to filter based on specific values of e.g. the data processing type, cannot be practically fulfilled without specifying the permissible processing types, which are "normalization, aggregation, and anonymization". | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Extended the Collective Behaviour Filter to use specifed types and values for its contents. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not fulfilled stage 2 requirement. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.6.1, 5.6.2.19, 5.6.2.20, 5.6.2.27, 5.6.3.5 (new), 5.8, 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 a backwards compatible feature in the OpenAPI file of the Naf\_EventExposure API. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

5.6.1 General

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

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

**Table 5.6.1-1: Naf\_EventExposure specific Data Types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Section defined** | **Description** | **Applicability** |
| AddrFqdn | 5.6.2.18 | IP address and/or FQDN. | PerformanceData  ServiceExperienceExt |
| AfEvent | 5.6.3.3 | Represents Application Events. |  |
| AfEventExposureSubsc | 5.6.2.2 | Represents an Individual Application Event Subscription resource. |  |
| AfEventExposureNotif | 5.6.2.3 | Describes notifications about application event that occurred in an Individual Application Event Subscription resource. |  |
| AfEventNotification | 5.6.2.6 | Represents information related to an event to be reported. |  |
| CollectiveBehaviourFilter | 5.6.2.19 | Contains the parameter type and value pair to express the collective behaviour event filters. | CollectiveBehaviour |
| CollectiveBehaviourFilterType | 5.6.3.4 |  | CollectiveBehaviour |
| CollectiveBehaviourInfo | 5.6.2.20 | Contains the collective behaviour analytics information. | CollectiveBehaviour |
| CommunicationCollection | 5.6.2.13 | Contains communication information. | UeCommunication |
| DataProcessingType | 5.6.3.5 | Represents a type of data processing. | ExtEventFilters |
| DispersionCollection | 5.6.2.21 | Contains Dispersion information collected. | Dispersion |
| EventFilter | 5.6.2.5 | Represents event filter information |  |
| EventsSubs | 5.6.2.4 | Represents an event to be subscribed and the related event filter information. |  |
| ExceptionInfo | 5.6.2.14 | Describes the exceptions information provided by AF. | Exceptions |
| MSAccessActivityCollection | 5.6.2.27 | Represents the Media Streaming access activities of UE Application collected via Data Collection AF. | MSAccessActivity |
| MsConsumptionCollection | 5.6.2.24 | Represents the Media Streaming Consumption reports of UE Application collected via Data Collection AF. | MSConsumption |
| MsDynPolicyInvocationCollection | 5.6.2.26 | Represents the Media Streaming Dynamic Policy invocation of UE Application collected via Data Collection AF. | MSDynPolicyInvocation |
| MsQoeMetricsCollection | 5.6.2.23 | Represents the Media Streaming QoE Metrics of UE Application collected via Data Collection AF. | MSQoeMetrics |
| MsNetAssInvocationCollection | 5.6.2.25 | Represents the Media Streaming Network Assistance invocation of UE Application collected via Data Collection AF. | MSNetAssInvocation |
| PerformanceData | 5.6.2.17 | Indicates the performance data. | PerformanceData |
| PerformanceDataCollection | 5.6.2.16 | Represents the performance data information collected for an AF application. | PerformanceData |
| PerUeAttribute | 5.6.2.22 | UE application data collected per UE. | CollectiveBehaviour |
| ServiceExperienceInfoPerApp | 5.6.2.7 | Contains service experience associated with the application | ServiceExperience |
| ServiceExperienceInfoPerFlow | 5.6.2.8 | Contains service experience associated with the service flow | ServiceExperience |
| SvcExperience | 5.6.2.9 | Contains a mean opinion score with the customized range. | ServiceExperience |
| UeCommunicationCollection | 5.6.2.11 | Contains UE communication information associated with the application. | UeCommunication |
| UeMobilityCollection | 5.6.2.10 | Contains UE mobility information associated with the application. | UeMobility |
| UeTrajectoryCollection | 5.6.2.12 | Contains UE trajectory information associated with the application. | UeMobility |
| UserDataCongestionCollection | 5.6.2.15 | Contains User Data Congestion Analytics related information collected. | UserDataCongestion |

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

**Table 5.6.1-2: Naf\_EventExposure re-used Data Types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Reference** | **Comments** | **Applicability** |
| ApplicationId | 3GPP TS 29.571 [13] | Application Identifier. |  |
| BitRate | 3GPP TS 29.571 [13] | String representing a bit rate that shall be formatted as follows:  pattern: "^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$"  Examples:  "125 Mbps", "0.125 Gbps", "125000 Kbps". | UserDataCongestion  CollectiveBehaviour |
| CpParameterSet | 3GPP TS 29.122 [17] | The Expected UE Behaviour parameters. | UeCommunicationExt\_eNA |
| DateTime | 3GPP TS 29.571 [13] | Contains a date and a time. |  |
| Dnai | 3GPP TS 29.571 [13] | Identifies a DNAI. |  |
| DurationSec | 3GPP TS 29.571 [13] | Indicates a period of time in units of seconds. | Dispersion |
| DynamicPolicy | 3GPP TS 26.512 [30] | Represents the Media Streaming Dynamic Policy. | MSDynPolicyInvocation |
| EthFlowDescription | 3GPP TS 29.514 [18] | Defines a packet filter for an Ethernet flow. |  |
| Exception | 3GPP TS 29.520 [19] | Describes the Exception information. |  |
| Float | 3GPP TS 29.571 [13] | Number with format "float" as defined in OpenAPI Specification [8]. |  |
| FlowDescription | 3GPP TS 29.514 [18] | Only IP 5-tuple (protocol, source and destination IP address, Source and destination port) is applicable. | Dispersion |
| FlowInfo | 3GPP TS 29.122 [17] | Represents flow information. |  |
| Gpsi | 3GPP TS 29.571 [13] | Identifies a GPSI. |  |
| GroupId | 3GPP TS 29.571 [13] | Contains a Group identifier. |  |
| IpAddr | 3GPP TS 29.571 [13] | Identifies IP address. | Dispersion |
| LocationArea5G | 3GPP TS 29.122 [17] | Represents a user location area when the UE is attached to 5G. |  |
| MediaStreamingAccessRecord | 3GPP TS 26.512 [30] | Represents the Media Streaming Access activity record. | MSAccessActivity |
| NetworkAssistanceSession | 3GPP TS 26.512 [30] | Represents the Media Streaming Network Assistance Session recommandation. | MSNetAssInvocation |
| PacketDelBudget | 3GPP TS 29.571 [13] | Indicates average Packet Delay. | PerformanceData |
| PacketLossRate | 3GPP TS 29.571 [13] | Indicates average Loss Rate. | PerformanceData |
| RedirectResponse | 3GPP TS 29.571 [13] | Contains redirection related information. | ES3XX |
| ReportingInformation | 3GPP TS 29.523 [12] | Represents the requirements of reporting the subscription. |  |
| SupportedFeatures | 3GPP TS 29.571 [13] | Indicates the features supported. |  |
| TimeWindow | 3GPP TS 29.122 [17] | Represents a time window identified by a start time and a stop time. |  |
| Uri | 3GPP TS 29.571 [13] | Contains a URI. |  |
| Volume | 3GPP TS 29.122 [17] | Unsigned integer identifying a volume in units of bytes. |  |
| UsageThreshold | 3GPP TS 29.122 [17] | data volume during the period | Dispersion |
| Supi | 3GPP TS 29.571 [13] | Contains a SUPI. |  |
| ExtGroupId | 3GPP TS 29.503 [27] | External Group Identifier for a user group. |  |
| GNSSAssistDataInfo | 3GPP TS 29.591 [31] | Represents GNSS Assistance Data information. | GNSSAssistData |

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

5.6.2.19 Type CollectiveBehaviourFilter

**Table 5.6.2.19-1: Definition of type CollectiveBehaviourFilter**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| type | CollectiveBehaviourFilterType | M | 1 | Parameter type for collective behaviour information event filter. |  |
| value | string | M | 1 | Value of the parameter type as in "type" attribute. |  |
| collBehAttr | array(PerUeAttribute) | O | 1..N | Contains values of collective behaviour attributes, at least one of which shall match for an AF event to be sent. If provided, the attributes "type" and "value" may be ignored. | ExtEventFilters |
| dataProcType | DataProcessingType | O | 0..1 | Contains the type of processing that shall have been performed on the data for an AF event to be sent. If provided, the attributes "type" and "value" may be ignored. | ExtEventFilters |
| listOfUeInd | boolean | O | 0..1 | Indicates whether request list of UE IDs that fulfill a collective behaviour within the area of interest.  This attribute shall set to "true" if request the list of UE IDs, otherwise, set to "false".  May only be present and sets to "true" if "AfEvent" sets to "COLLECTIVE\_BEHAVIOUR". |  |

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

5.6.2.20 Type CollectiveBehaviourInfo

**Table 5.6.2.20-1: Definition of type CollectiveBehaviourInfo**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| colAttrib | array(PerUeAttribute) | M | 1..N | The list of collective attribute values. If the "colAttrib" attribute contains multiple entries, then a UE is considered to fulfil the behaviour if it fulfils the behaviour described by at least one of the elements of the array. |  |
| noOfUes | integer | O | 0..1 | Identifies the total number of UEs that fulfil a collective behaviour within the area of interest. |  |
| appIds | array(ApplicationId) | O | 1..N | Indicates the identifiers of the applications providing this information. |  |
| extUeIds | array(Gpsi) | C | 1..N | Gpsi information of the UEs that fulfil the collective behaviour with in the area of the interest. May only be present if the "listOfUe" attribute is subscribed and sets to "true".  (NOTE) |  |
| ueIds | array(Supi) | C | 1..N | Supis of UEs that fulfil the collective behaviour with in the area of the interest. May only be present if the "listOfUe" attribute is subscribed and sets to "true". (NOTE) |  |
| NOTE: Only one of "extUeIds" or "ueIds" shall be provided. "ueIds" attribute may only be provided by trusted AF. | | | | | |

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

5.6.2.27 Type MSAccessActivityCollection

**Table 5.6.2.27-1: Definition of type MSAccessActivityCollection**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| msAccActs | array(MediaStreamingAccessRecord) | M | 1..N | Indicate Media Streaming access activities information as specified in clause 17.2 of 3GPP TS 26.512 [30]. |  |

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

5.6.3.5 Enumeration: DataProcessingType

The enumeration DataProcessingType represents the type of data processing performed by the AF during UE data collection. It shall comply with the provisions defined in table 5.6.3.5-1.

**Table 5.6.3.5-1: Enumeration DataProcessingType**

|  |  |  |
| --- | --- | --- |
| **Enumeration value** | **Description** | **Applicability** |
| AGGREGATION | Used for aggregated data. |  |
| NORMALIZATION | Used for normalized data. |  |
| ANONYMIZATION | Used for anonymized data. |  |

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

5.8 Feature negotiation

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

**Table 5.8-1: Supported Features**

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
| 1 | ServiceExperience | This feature indicates support for the event related to service experience. |
| 2 | UeMobility | This feature indicates support for the event related to UE mobility. |
| 3 | UeCommunication | This feature indicates support for the event related to UE communication information. |
| 4 | Exceptions | This feature indicates support for the event related to exception information. |
| 5 | 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 clauses 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 clause 6.10.9 of 3GPP TS 29.500 [5]. |
| 6 | EneNA | This feature indicates support for the enhancements of network data analytics requirements. |
| 7 | UserDataCongestion | This feature indicates support for the event related to User Data Congestion Analytics related information. |
| 8 | PerformanceData | This feature indicates support for the event related to performance data information. |
| 9 | Dispersion | This feature indicates support for the event related to Dispersion Analytics related information. |
| 10 | CollectiveBehaviour | This feature indicates support for the event related to collective behaviour information. |
| 11 | ServiceExperienceExt | This feature indicates support for the extensions to the event related to service experience, including reporting Application Server Instance. Supporting this feature also requires the support of feature ServiceExperience. |
| 12 | MSQoeMetrics | This feature indicates support for the event related to Media Streaming QoE metrics for UE Application collected via the Data Collection AF. |
| 13 | MSConsumption | This feature indicates support for the event related to Media Streaming Consumption reports for UE Application collected via the Data Collection AF. |
| 14 | MSNetAssInvocation | This feature indicates support for the event related to Media Streaming Network Assistance invocation for UE Application collected via the Data Collection AF. |
| 15 | MSDynPolicyInvocation | This feature indicates support for the event related to Media Streaming Dynamic Policy invocation for UE Application collected via the Data Collection AF. |
| 16 | MSAccessActivity | This feature indicates support for the event related to Media Streaming access activity for UE Application collected via the Data Collection AF. |
| 17 | DataAccProfileId | This feature indicates support for Data Access Profile Identifier. |
| 18 | AllApplications | This feature indicates applicable to all the applications. |
| 19 | GNSSAssistData | This feature indicates the support of the GNSS Assistance Data Collection functionality. |
| 20 | PerformanceDataExt\_AIML | This feature indicates the support for the extensions of the analytics related to DN performance supporting AIML, including support of Max/Min UL/DL data collection on packet delay, pack loss and throughput. Supporting this feature also requires the support of feature PerformanceData. |
| 21 | UeMobilityExt\_AIML | This feature indicates support for further extensions to the event related to UE mobility supporting AIML including support of list of application service area collection. Supporting this feature also requires the support of feature UeMobility. |
| 22 | EnPerformanceData | This feature indicates support for the enhancements of performance data. |
| 23 | UeCommunicationExt\_eNA | This feature indicates support for the enhancements of UE Communication, including support of ordering criterion. Supporting this feature also requires the support of UeCommunication feature. |
| 24 | ExtEventFilters | Indicates support of extended AF event filters. |

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

A.2 Naf\_EventExposure API

openapi: 3.0.0

info:

version: 1.3.0-alpha.2

title: Naf\_EventExposure

description: |

AF Event Exposure Service.

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externalDocs:

description: >

3GPP TS 29.517 V18.1.0; 5G System; Application Function Event Exposure Service; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.517/

servers:

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

variables:

apiRoot:

default: https://example.com

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

security:

- {}

- oAuth2ClientCredentials: []

paths:

/subscriptions:

post:

summary: Creates a new Individual Application Event Exposure Subscription resource

operationId: PostAfEventExposureSubsc

tags:

- Application Event Subscription (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: Success

content:

application/json:

schema:

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

headers:

Location:

description: >

Contains the URI of the created individual application event subscription resource

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'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

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

default:

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

callbacks:

AfEventExposureNotif:

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

post:

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'204':

description: No Content, Notification was successful

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'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'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

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

default:

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

/subscriptions/{subscriptionId}:

get:

summary: "Reads an existing Individual Application Event Subscription"

operationId: GetAfEventExposureSubsc

tags:

- Individual Application Event Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Application 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/AfEventExposureSubsc'

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'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'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

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

default:

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

put:

summary: "Modifies an existing Individual Application Event Subscription "

operationId: PutAfEventExposureSubsc

tags:

- Individual Application Event Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

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

parameters:

- name: subscriptionId

in: path

description: Application Event Subscription ID

required: true

schema:

type: string

responses:

'200':

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

content:

application/json:

schema:

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

'204':

description: No Content. Resource was successfully modified

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'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'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

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

default:

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

delete:

summary: "Cancels an existing Individual Application Event Subscription "

operationId: DeleteAfEventExposureSubsc

tags:

- Individual Application Event Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Application Event Subscription ID

required: true

schema:

type: string

responses:

'204':

description: No Content. Resource was successfully deleted

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'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'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

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

default:

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

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUri}'

scopes: {}

description: >

For trusted AF, the 'naf-eventexposure' shall be used as 'scopes' and

'{nrfApiRoot}/oauth2/token' shall be used as 'tokenUri'.

schemas:

AfEventExposureNotif:

description: >

Represents notifications on application event(s) that occurred for an Individual Application

Event Subscription resource.

type: object

properties:

notifId:

type: string

eventNotifs:

type: array

items:

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

minItems: 1

required:

- notifId

- eventNotifs

AfEventExposureSubsc:

description: Represents an Individual Application Event Subscription resource.

type: object

properties:

dataAccProfId:

type: string

eventsSubs:

type: array

items:

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

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/AfEventNotification'

minItems: 1

suppFeat:

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

required:

- eventsSubs

- eventsRepInfo

- notifId

- notifUri

AfEventNotification:

description: Represents information related to an event to be reported.

type: object

properties:

event:

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

timeStamp:

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

svcExprcInfos:

type: array

items:

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

minItems: 1

ueMobilityInfos:

type: array

items:

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

minItems: 1

ueCommInfos:

type: array

items:

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

minItems: 1

excepInfos:

type: array

items:

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

minItems: 1

congestionInfos:

type: array

items:

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

minItems: 1

perfDataInfos:

type: array

items:

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

minItems: 1

dispersionInfos:

type: array

items:

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

minItems: 1

collBhvrInfs:

type: array

items:

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

minItems: 1

msQoeMetrInfos:

type: array

items:

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

minItems: 1

msConsumpInfos:

type: array

items:

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

minItems: 1

msNetAssInvInfos:

type: array

items:

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

minItems: 1

msDynPlyInvInfos:

type: array

items:

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

minItems: 1

msAccActInfos:

type: array

items:

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

minItems: 1

required:

- event

- timeStamp

EventsSubs:

description: Represents an event to be subscribed and the related event filter information.

type: object

properties:

event:

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

eventFilter:

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

required:

- event

- eventFilter

EventFilter:

description: Represents event filter information for an event.

type: object

properties:

gpsis:

type: array

items:

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

minItems: 1

supis:

type: array

items:

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

minItems: 1

exterGroupIds:

type: array

items:

$ref: 'TS29503\_Nudm\_SDM.yaml#/components/schemas/ExtGroupId'

minItems: 1

interGroupIds:

type: array

items:

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

anyUeInd:

type: boolean

ueIpAddr:

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

appIds:

type: array

items:

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

minItems: 1

locArea:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

collAttrs:

type: array

items:

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

minItems: 1

exceptionReqs:

type: array

items:

$ref: 'TS29520\_Nnwdaf\_EventsSubscription.yaml#/components/schemas/Exception'

minItems: 1

ServiceExperienceInfoPerApp:

description: Contains service experience information associated with an application.

type: object

properties:

appId:

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

appServerIns:

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

svcExpPerFlows:

type: array

items:

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

minItems: 1

gpsis:

type: array

items:

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

minItems: 1

supis:

type: array

items:

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

minItems: 1

required:

- svcExpPerFlows

ServiceExperienceInfoPerFlow:

description: Contains service experience information associated with a service flow.

type: object

properties:

svcExprc:

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

timeIntev:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

dnai:

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

ipTrafficFilter:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/FlowInfo'

ethTrafficFilter:

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

SvcExperience:

description: Contains a mean opinion score with the customized range.

type: object

properties:

mos:

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

upperRange:

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

lowerRange:

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

UeMobilityCollection:

description: >

Contains UE mobility information associated with an application. If the allAppInd attribute

is present and set to true, then the value in the appId shall be ignored, which indicates

the collected UE mobility information is applicable to all the applications for the UE.

type: object

properties:

gpsi:

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

supi:

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

appId:

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

allAppInd:

type: boolean

description: >

Indicates applicable to all applications if set to true, otherwise set to false.

Default value is false if omitted.

ueTrajs:

type: array

items:

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

minItems: 1

areas:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

minItems: 1

required:

- appId

- ueTrajs

UeCommunicationCollection:

description: Contains UE communication information associated with an application.

type: object

properties:

gpsi:

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

supi:

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

exterGroupId:

$ref: 'TS29503\_Nudm\_SDM.yaml#/components/schemas/ExtGroupId'

interGroupId:

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

appId:

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

expectedUeBehavePara:

$ref: 'TS29122\_CpProvisioning.yaml#/components/schemas/CpParameterSet'

comms:

type: array

items:

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

minItems: 1

required:

- appId

- comms

UeTrajectoryCollection:

description: Contains UE trajectory information associated with an application.

type: object

properties:

ts:

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

locArea:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

required:

- ts

- locArea

CommunicationCollection:

description: Contains communication information.

type: object

properties:

startTime:

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

endTime:

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

ulVol:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Volume'

dlVol:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Volume'

required:

- startTime

- endTime

- ulVol

- dlVol

ExceptionInfo:

description: Represents the exceptions information provided by the AF.

type: object

properties:

ipTrafficFilter:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/FlowInfo'

ethTrafficFilter:

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

exceps:

type: array

items:

$ref: 'TS29520\_Nnwdaf\_EventsSubscription.yaml#/components/schemas/Exception'

minItems: 1

required:

- exceps

oneOf:

- required: [ipTrafficFilter]

- required: [ethTrafficFilter]

UserDataCongestionCollection:

description: Contains User Data Congestion Analytics related information collection.

type: object

properties:

appId:

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

ipTrafficFilter:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/FlowInfo'

timeInterv:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

thrputUl:

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

thrputDl:

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

thrputPkUl:

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

thrputPkDl:

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

oneOf:

- required: [appId]

- required: [ipTrafficFilter]

PerformanceDataCollection:

description: Contains Performance Data Analytics related information collection.

type: object

properties:

appId:

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

ueIpAddr:

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

ipTrafficFilter:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/FlowInfo'

ueLoc:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

appLocs:

type: array

items:

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

minItems: 1

asAddr:

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

perfData:

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

timeStamp:

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

required:

- perfData

- timeStamp

PerformanceData:

description: Contains Performance Data.

type: object

properties:

pdb:

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

pdbDl:

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

maxPdbUl:

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

maxPdbDl:

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

plr:

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

plrDl:

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

maxPlrUl:

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

maxPlrDl:

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

thrputUl:

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

maxThrputUl:

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

minThrputUl:

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

thrputDl:

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

maxThrputDl:

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

minThrputDl:

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

AddrFqdn:

description: IP address and/or FQDN.

type: object

properties:

ipAddr:

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

fqdn:

type: string

description: Indicates an FQDN.

DispersionCollection:

description: Contains the dispersion information collected for an AF.

type: object

properties:

gpsi:

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

supi:

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

ueAddr:

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

dataUsage:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/UsageThreshold'

flowDesp:

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

appId:

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

dnais:

type: array

items:

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

minItems: 1

appDur:

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

required:

- dataUsage

oneOf:

- required: [gpsi]

- required: [supi]

- required: [ueAddr]

CollectiveBehaviourFilter:

description: Contains the collective behaviour filter information to be collected from UE.

type: object

properties:

type:

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

value:

type: string

description: Value of the parameter type as in the type attribute.

collBehAttr:

type: array

items:

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

minItems: 1

description: >

Contains the values of collective behaviour attributes at least one of which shall

match for an AF event to be sent.

dataProcType:

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

listOfUeInd:

type: boolean

description: >

Indicates whether request list of UE IDs that fulfill a collective behaviour within the

area of interest. This attribute shall set to "true" if request the list of UE IDs,

otherwise, set to "false". May only be present and sets to "true" if "AfEvent" sets to

"COLLECTIVE\_BEHAVIOUR".

required:

- type

- value

CollectiveBehaviourInfo:

description: Contains the collective behaviour information to be reported to the subscriber.

type: object

properties:

colAttrib:

type: array

items:

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

minItems: 1

noOfUes:

type: integer

description: Total number of UEs that fulfil a collective within the area of interest.

appIds:

type: array

items:

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

minItems: 1

extUeIds:

type: array

items:

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

minItems: 1

ueIds:

type: array

items:

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

minItems: 1

required:

- colAttrib

oneOf:

- required: [extUeIds]

- required: [ueIds]

PerUeAttribute:

description: UE application data collected per UE.

type: object

properties:

ueDest:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

route:

type: string

avgSpeed:

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

timeOfArrival:

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

MsQoeMetricsCollection:

description: >

Contains the Media Streaming QoE metrics information collected for an UE Application via AF.

type: object

properties:

msQoeMetrics:

type: array

items:

type: string

minItems: 1

required:

- msQoeMetrics

MsConsumptionCollection:

description: >

Contains the Media Streaming Consumption information collected for an UE Application via AF.

type: object

properties:

msConsumps:

type: array

items:

type: string

description: >

Represents the Media Streaming Consumption reports with formatting as specified in

clause 11.3.3 of 3GPP TS 26.512 [30], if required for Media Streaming UE Application.

minItems: 1

required:

- msConsumps

MsNetAssInvocationCollection:

description: >

Contains the Media Streaming Network Assistance invocation collected for an UE Application

via AF.

type: object

properties:

msNetAssInvocs:

type: array

items:

$ref: 'TS26512\_M5\_NetworkAssistance.yaml#/components/schemas/NetworkAssistanceSession'

minItems: 1

required:

- msNetAssInvocs

MsDynPolicyInvocationCollection:

description: >

Contains the Media Streaming Dynamic Policy invocation collected for an UE

Application via AF.

type: object

properties:

msDynPlyInvocs:

type: array

items:

$ref: 'TS26512\_M5\_DynamicPolicies.yaml#/components/schemas/DynamicPolicy'

minItems: 1

required:

- msDynPlyInvocs

MSAccessActivityCollection:

description: Contains Media Streaming access activity collected for an UE Application via AF.

type: object

properties:

msAccActs:

type: array

items:

$ref: 'TS26512\_R4\_DataReporting.yaml#/components/schemas/MediaStreamingAccessRecord'

minItems: 1

required:

- msAccActs

# Simple data types and Enumerations

AfEvent:

description: Represents Application Events.

anyOf:

- type: string

enum:

- SVC\_EXPERIENCE

- UE\_MOBILITY

- UE\_COMM

- EXCEPTIONS

- USER\_DATA\_CONGESTION

- PERF\_DATA

- DISPERSION

- COLLECTIVE\_BEHAVIOUR

- MS\_QOE\_METRICS

- MS\_CONSUMPTION

- MS\_NET\_ASSIST\_INVOCATION

- MS\_DYN\_POLICY\_INVOCATION

- MS\_ACCESS\_ACTIVITY

- GNSS\_ASSISTANCE\_DATA

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration but

is not used to encode content defined in the present version of this API.

CollectiveBehaviourFilterType:

description: Represents collective behaviour parameter type.

anyOf:

- type: string

enum:

- COLLECTIVE\_ATTRIBUTE

- DATA\_PROCESSING

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration but

is not used to encode content defined in the present version of this API.

DataProcessingType:

description: Represents a type of data processing.

anyOf:

- type: string

enum:

- AGGREGATION

- NORMALIZATION

- ANONYMIZATION

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration but

is not used to encode content defined in the present version of this API.

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