**3GPP TSG-CT WG3 Meeting #135C3-243381**

**Hyderabad, India, 27 - 31 May, 2024 (revision of C3-243abc)**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.517** | **CR** | **0132** | **rev** | **-** | **Current version:** | **18.5.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
|  |

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

|  |
| --- |
|  |
| ***Title:***  | Support of providing confidence of the relative proximity data collected from the AF |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | eNA\_Ph3 |  | ***Date:*** | 2024-05-10 |
|  |  |  |  |  |
| ***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 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | According to Table 6.19.2-2 in TS 23.288, the AF may provide the confidence information of the relative proximity data to the consumer. This confidence attribute needs to be defined in stage 3. |
|  |  |
| ***Summary of change:*** | Update CollectiveBehaviourInfo data type to include the confidence information of the relative proximity data. |
|  |  |
| ***Consequences if not approved:*** | Stage 2 requirement is not implemented. |
|  |  |
| ***Clauses affected:*** | 5.6.2.20, 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:*** | The CR introduces backward compatible features to the OpenAPI file for Naf\_EventExposure API. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st 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.(NOTE 2) |  |
| 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 1) |  |
| 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 1) |  |
| confidence | Uinteger | O | 0..1 | Indicates the confidence on the relative proximity data.Minimum = 0. Maximum = 100.(NOTE 2) | RelativeProximity |
| NOTE 1: Only one of "extUeIds" or "ueIds" shall be provided. "ueIds" attribute may only be provided by trusted AF.NOTE 2: If the "RelativeProximity" feature is supported, the "colAttrib" is not required to be provided. |

\*\*\* 2nd 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 as part of the enhancements to the 5G LCS functionality.The following functionalities are supported:- GNSS Assistance Data Collection. |
| 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. This feature requires the support of the PerformanceData feature. |
| 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 | ServiceExperienceExt2\_eNA | This feature indicates support for the extensions to the event related to service experience supporting eNA, including Service Experience Contribution Weights. Supporting this feature also requires the support of feature ServiceExperience. |
| 25 | EnhDataMgmt | Indicates the support of enhanced data management mechanisms. Supporting this feature also requires the support of feature EneNA. |
| 26 | ExtEventFilters | Indicates support of extended AF event filters. |
| 27 | DataVolTransferTime | This feature indicates support for the event related to data volume transfer time. |
| 28 | MSEventExposure | This feature indicates the support for Media Streaming event exposure.This feature is recommended to be implemented to avoid the usage of the deprecated attributes. |
| 29 | PerEventRepReq | This feature indicates the support of the per-event reporting requirements management functionality.The following functionalities are supported:- Provisioning/updating the reporting requirements on a per subscribed event granularity. |
| 30 | RelativeProximity | This feature indicates the support of providing confidence information of the relative proximity data. |

\*\*\* 3rd Change \*\*\*

# A.2 Naf\_EventExposure API

openapi: 3.0.0

info:

 version: 1.3.0-alpha.6

 title: Naf\_EventExposure

 description: |

 AF Event Exposure Service.

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externalDocs:

 description: >

 3GPP TS 29.517 V18.5.0; 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

 deprecated: true

 msQoeMetrics:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/QoEMetricsCollection'

 minItems: 1

 description: Represents the Media Streaming QoE metrics event records.

 msConsumpInfos:

 type: array

 items:

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

 minItems: 1

 deprecated: true

 msConsumpRpts:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/ConsumptionReportingUnitsCollection'

 minItems: 1

 description: Represents the Media Streaming Consumption event records.

 msNetAssInvInfos:

 type: array

 items:

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

 minItems: 1

 deprecated: true

 msNetAssistInvs:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/NetworkAssistanceInvocationsCollection'

 minItems: 1

 description: >

 Represents the Media Streaming Network Assistance Invocations event records.

 msDynPlyInvInfos:

 type: array

 items:

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

 minItems: 1

 deprecated: true

 msDynPlyInvs:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/DynamicPolicyInvocationsCollection'

 minItems: 1

 description: Represents the Media Streaming Dynamic Policy Invocations event records.

 msAccActInfos:

 type: array

 items:

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

 minItems: 1

 deprecated: true

 msAccesses:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/MediaStreamingAccessesCollection'

 minItems: 1

 description: Represents the Media Streaming access event records.

 gnssAssistDataInfo:

 $ref: 'TS29591\_Nnef\_EventExposure.yaml#/components/schemas/GNSSAssistDataInfo'

 datVolTransTimeInfos:

 type: array

 items:

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

 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'

 eventRepInfo:

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

 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

 oneOf:

 - required: [gpsis]

 - required: [supis]

 - required: [exterGroupIds]

 - required: [interGroupIds]

 - required: [anyUeInd]

 - required: [ueIpAddr]

 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

 contrWeights:

 type: array

 items:

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

 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'

 timeStamp:

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

 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

 confidence:

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

 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

 DatVolTransTimeCollection:

 description: Contains the collective data volume transfer time information to be reported to the subscriber.

 type: object

 properties:

 appId:

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

 appServerInst:

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

 gpsi:

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

 supi:

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

 ulTransVol:

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

 dlTransVol:

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

 ulTransTimeDur:

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

 dlTransTimeDur:

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

 anyOf:

 - anyOf:

 - required: [ulTransVol]

 - required: [dlTransVol]

 - anyOf:

 - required: [ulTransTimeDur]

 - required: [dlTransTimeDur]

# Simple data types and Enumerations

 AfEvent:

 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

 - DATA\_VOLUME\_TRANSFER\_TIME

 - 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.

 description: |

 Represents an application's event.

 Possible values are:

 - SVC\_EXPERIENCE: Indicates that the subscribed/notified event is service experience

 information for an application.

 - UE\_MOBILITY: Indicates that the subscribed/notified event is UE mobility information.

 - UE\_COMM: Indicates that the subscribed/notified event is UE communication information.

 - EXCEPTIONS: Indicates that the subscribed/notified event is exceptions information.

 - USER\_DATA\_CONGESTION: Indicates that the subscribed/notified event is user data congestion

 analytics related information.

 - PERF\_DATA: Indicates that the subscribed/notified event is performance data information.

 - DISPERSION: Indicates that the subscribed/notified event is dispersion information.

 - COLLECTIVE\_BEHAVIOUR: Indicates that the subscribed/notified event is collective behaviour

 information.

 - MS\_QOE\_METRICS: Indicates that the subscribed/notified event is Media Streaming QoE

 metrics.

 - MS\_CONSUMPTION: Indicates that the subscribed/notified event is Media Streaming

 consumption reports.

 - MS\_NET\_ASSIST\_INVOCATION: Indicates that the subscribed/notified event is Media Streaming

 network assistance invocation.

 - MS\_DYN\_POLICY\_INVOCATION: Indicates that the subscribed/notified event is Media Streaming

 dynamic policy invocation.

 - MS\_ACCESS\_ACTIVITY: Indicates that the subscribed/notified event is Media Streaming access

 activity.

 - GNSS\_ASSISTANCE\_DATA: Indicates that the subscribed/notified event is GNSS Assistance Data

 Collection.

 CollectiveBehaviourFilterType:

 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.

 description: |

 Represents the parameter type for collective behaviour information filtering.

 Possible values are:

 - COLLECTIVE\_ATTRIBUTE: Indicates that the parameter type is collective attributes.

 - DATA\_PROCESSING: Indicates that the parameter type is data processing.

 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 \*\*\*