**TSG-CT WG3 Meeting #108-e *C3-201414***

**E-Meeting, 19th – 28th February 2020 (Revision of C3-201294)**

|  |
| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **29.522** | **CR** | **0142** | **rev** | **1** | **Current version:** | **16.2.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
|  |

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

|  |
| --- |
|  |
| ***Title:***  | AnalyticsExposure API, Analytics Event Filter associated with all events |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | eNA |  | ***Date:*** | 2020-02-17 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | The AnalyticsExposure API is used by the AF to request the NWDAF via the NEF to report the analytics results about UE mobility, UE communication, data congestion and abnormal behaviour. The event filter applies to all the above analytics types, for different type, different filter information should be included.  |
|  |  |
| ***Summary of change:*** | Complete the definition of Analytics Event Filter. |
|  |  |
| ***Consequences if not approved:*** | Incomplete specification. |
|  |  |
| ***Clauses affected:*** | 2; 5.6.3.2; 5.6.3.3.5; 5.6.3.3.6; 5.6.3.3.7; 5.6.3.3.13; A.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR introduces backward compatible feature into the OpenAPI file for AnalyticsExposure API. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**…**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.502: "Procedures for the 5G system".

[3] 3GPP TS 23.501: "System Architecture for the 5G".

[4] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

[5] Open API Initiative, "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.

[6] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

[7] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[8] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[9] 3GPP TS 29.521: "5G System; Binding Support Management Service; Stage 3".

[10] Void.

[11] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs; Stage 2".

[12] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".

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

[14] 3GPP TS 33.122: "Security Aspects of Common API Framework for 3GPP Northbound APIs".

[15] Void.

[16] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

[17] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[18] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[19] 3GPP TS 29.554: "5G System; Background Data Transfer Policy Control Service; Stage 3".

[20] 3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".

[21] 3GPP TR 21.900: "Technical Specification Group working methods".

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

[23] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Control Data, Application Data and Structured Data for Exposure; Stage 3".

[24] 3GPP TS 29.541: "5G System; Session Management Services for Non-IP Data Delivery (NIDD); Stage 3".

[25] 3GPP TS 29.502: "5G System, Session Management Services; Stage 3".

[26] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

[27] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

[28] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G system (5GS)".

[29] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[TS29503] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

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

#### 5.6.3.2 Reused data types

The data types reused by the AnalytcisExposure API from other specifications are listed in table 5.6.3.2-1.

Table 5.6.3.2-1: Re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| AnalyticsReportingRequirement | 3GPP TS 29.520 [27] | Describes the analytics reporting requirement information. |
| ApplicationId | 3GPP TS 29.571 [8] |  |
| DateTime | 3GPP TS 29.122 [4] |  |
| DurationSec | 3GPP TS 29.122 [4] | Seconds of duration. |
| ExternalGroupId | 3GPP TS 29.122 [4] | External Group Identifier for a user group. |
| Gpsi | 3GPP TS 29.571 [8] | Identifies a GPSI. |
| NotificationMethod | 3GPP TS 29.508 [26] | Represents the Notification Method. |
| EventReportingRequirement | 3GPP TS 29.520 [27] |  |
| ExceptionId | 3GPP TS 29.520 [27] |  |
| ExpectedAnalyticsType | 3GPP TS 29.520 [27] |  |
| ExpectedUeBehaviourData | 3GPP TS 29.503 [TS29503] |  |
| SamplingRatio | 3GPP TS 29.571 [8] | Indicates Sampling Ratio. |
| ScheduledCommunicationTime | 3GPP TS 29.122 [4] |  |
| SupportedFeatures | 3GPP TS 29.571 [8] | Used to negotiate the applicability of the optional features defined in table 5.6.4-1. |
| TargetUeInformation | 3GPP TS 29.520 [27] |  |
| ThresholdLevel | 3GPP TS 29.520 [27] |  |
| Uinteger | 3GPP TS 29.571 [8] | Unsigned integer. |
| Uri | 3GPP TS 29.571 [8] | Identifies a referenced resource. |
| WebsockNotifConfig | 3GPP TS 29.122 [4] | Contains the configuration parameters to set up notification delivery over Websocket protocol. |
| LocationArea5G | 3GPP TS 29.122 [4] |  |
| Communication | 3GPP TS 29.520 [27] |  |

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

##### 5.6.3.3.5 Type: AnalyticsEventSubsc

Table 5.6.3.3.5-1: Definition of type AnalyticsEventSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| analyEvent | AnalyticsEvent | M | 1 | Requested analytics event. |  |
| analyEventFilter | AnalyticsEventFilterSubsc | O | 0..1 | Represents analytics event filter. | (NOTE) |
| tgtUe | TargetUeId | M | 1 | Identifies target UE information | (NOTE) |
| NOTE: Applicability is further described in the corresponding data type. |

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

##### 5.6.3.3.6 Type: AnalyticsEventFilterSubsc

Table 5.6.3.3.6-1: Definition of type AnalyticsEventFilterSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
|  |  |  |  |  |  |
| locArea | LocationArea5G | O | 0..1 | Network area of interest(NOTE 1) | Abnormal\_BehaviorCongestionUe\_CommunicationUe\_MobilityQoS\_Sustainability |
| appIds | array(ApplicationId) | O | 1..N | Each element identifies an application. | Abnormal\_BehaviorUe\_Communication |
| excepRequs | array(Exception) | O | 1..N | Represents a list of Exception Ids with associated thresholds.(NOTE 2, NOTE 3) | Abnormal\_Behavior |
| exptAnaType | ExpectedAnalyticsType | O | 0..1 | Represents expected UE analytics type.(NOTE 3) | Abnormal\_Behavior |
| exptUeBehav | ExpectedUeBehaviourData | O | 0..1 | Represents expected UE behaviour. | Abnormal\_Behavior |
| reptThlds | array(ThresholdLevel) | O | 1..N | Represents the congestion levels to be reached in order to be notified by the NEF.(NOTE 4) | Congestion |
| NOTE 1: The "locArea" attribute shall be provided if the "tgtUe" attribute sets to "anyUeInd".NOTE 2: Only "excepId" and "excepLevel" within the Exception data type apply to the "excepRequs" attribute.NOTE 3: Either "excepRequs" or "exptAnaType" shall be provided if the subscribed event is "ABNORMAL\_BEHAVIOUR".NOTE 4: If the subscribed event is "CONGESTION", this attribute shall be provided if "notifMethod" within "analyRepInfo" sets to "ON\_EVENT\_DETECTION" or omitted. |

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

##### 5.6.3.3.7 Type TargetUeId

Table 5.6.3.3.7-1: Definition of type TargetUeId

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| anyUeInd | boolean | O | 0..1 | Identifies whether the AF request applies to any UE.This attribute shall set to "true" if applicable for any UE, otherwise, set to "false". |  |
| gpsi | Gpsi | O | 0..1 | Identifies a GPSI for an UE. | Abnormal\_BehaviorCongestionUe\_MobilityUe\_Communication |
| exterGroupId | ExternalGroupId | O | 0..1 | Represents an external group identifier and identifies a group of UEs. | Abnormal\_BehaviorUe\_MobilityUe\_Communication |
| NOTE: For an applicable feature, only one attribute identifying the target UE shall be provided. |

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

##### 5.6.3.3.13 Type AnalyticsEventFilter

Table 5.6.3.3.13-1: Definition of type AnalyticsEventFilter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| locArea | LocationArea5G | C | 0..1 | This IE represents the network area where the NF service consumer wants to know the analytics result.Shall be present if the "analyEvent" attribute sets to "UE\_MOBILITY". | Ue\_MobilityAbnormal\_Behavior |
| maxAnaEntry | Uinteger | O | 0..1 | Maximum number of analytics entries expected for an analytics report. | Ue\_MobilityUe\_Communication |
| appIds | array(ApplicationId) | O | 1..N | Each element identifies an application. | Abnormal\_Behavior |
| excepIds | array(ExceptionId) | O | 1..N | Represents a list of Exception Ids. (NOTE) | Abnormal\_Behavior |
| exptAnaType | ExpectedAnalyticsType | O | 0..1 | Represents expected UE analytics type. (NOTE) | Abnormal\_Behavior |
| exptUeBehav | ExpectedUeBehaviourData | O | 0..1 | Represents expected UE behaviour. | Abnormal\_Behavior |
| NOTE: Either "excepIds" or "exptAnaType" shall be provided if the subscribed event is "ABNORMAL\_BEHAVIOUR". |

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

# A.4 AnalyticsExposure API

openapi: 3.0.0

info:

 title: 3gpp-analyticsexposure

 version: 1.0.0.alpha-1

 description: |

 API for Analytics Exposure.

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externalDocs:

 description: 3GPP TS 29.522 V16.2.0; 5G System; Network Exposure Function Northbound APIs.

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.522/'

security:

 - {}

 - oAuth2ClientCredentials: []

servers:

 - url: '{apiRoot}/3gpp-analyticsexposure/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in subclause 5.2.4 of 3GPP TS 29.122.

paths:

 /{afId}/subscriptions:

 get:

 summary: read all of the active subscriptions for the AF

 tags:

 - AF level GET Operation

 parameters:

 - name: afId

 in: path

 description: Identifier of the AF

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK (Successful get all of the active subscriptions for the AF)

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 0

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '406':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

 post:

 summary: Creates a new subscription resource

 tags:

 - subscription level POST Operation

 parameters:

 - name: afId

 in: path

 description: Identifier of the AF

 required: true

 schema:

 type: string

 requestBody:

 description: new subscription creation

 required: true

 content:

 application/json:

 schema:

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

 callbacks:

 notification:

 '{request.body#/notifUri}':

 post:

 requestBody: # contents of the callback message

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: No Content (successful notification)

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

 responses:

 '201':

 description: Created (Successful creation)

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the newly created resource'

 required: true

 schema:

 type: string

 '204':

 description: Successful case. The resource has been successfully created and no additional content is to be sent in the response message.

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

 /{afId}/subscriptions/{subscriptionId}:

 get:

 summary: read an active subscription for the AF and the subscription Id

 tags:

 - Subscription level GET Operation

 parameters:

 - name: afId

 in: path

 description: Identifier of the AF

 required: true

 schema:

 type: string

 - name: subscriptionId

 in: path

 description: Identifier of the subscription resource

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK (Successful get the active subscription)

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '406':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

 put:

 summary: Updates/replaces an existing subscription resource

 tags:

 - Subscription level PUT Operation

 parameters:

 - name: afId

 in: path

 description: Identifier of the AF

 required: true

 schema:

 type: string

 - name: subscriptionId

 in: path

 description: Identifier of the subscription resource

 required: true

 schema:

 type: string

 requestBody:

 description: Parameters to update/replace the existing subscription

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: OK (Successful deletion of the existing subscription)

 content:

 application/json:

 schema:

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

 '204':

 description: Successful case. The resource has been successfully updated and no additional content is to be sent in the response message.

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

 delete:

 summary: Deletes an already existing subscription

 tags:

 - Subscription level DELETE Operation

 parameters:

 - name: afId

 in: path

 description: Identifier of the AF

 required: true

 schema:

 type: string

 - name: subscriptionId

 in: path

 description: Identifier of the subscription resource

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content (Successful deletion of the existing subscription)

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

 /fetch:

 post:

 summary: Fetch analytics information

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: The requested information was returned successfully.

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{tokenUrl}'

 scopes: {}

 schemas:

 AnalyticsExposureSubsc:

 type: object

 properties:

 analyEventsSubs:

 type: array

 items:

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

 minItems: 1

 analyRepInfo:

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

 notifUri:

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

 notifId:

 type: string

 suppFeat:

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

 required:

 - analyEventsSubs

 - analyRepInfo

 - notifUri

 - notifId

 AnalyticsEventNotification:

 type: object

 properties:

 notifId:

 type: string

 analyEventNotifs:

 type: array

 items:

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

 minItems: 1

 AnalyticsEventNotif:

 type: object

 properties:

 analyEvent:

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

 timeStamp:

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

 ueMobilityInfos:

 type: array

 items:

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

 minItems: 1

 ueCommInfos:

 type: array

 items:

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

 minItems: 1

 abnormalInfo:

 type: string

 congestInfo:

 type: string

 required:

 - analyEvent

 - timeStamp

 AnalyticsEventSubsc:

 type: object

 properties:

 analyEvent:

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

 analyEventFilter:

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

 tgtUe:

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

 required:

 - analyEvent

 - tgtUe

 AnalyticsEventFilterSubsc:

 type: object

 properties:

 locArea:

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

 appIds:

 type: array

 items:

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

 minItems: 1

 excepRequs:

 type: array

 items:

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

 minItems: 1

 exptAnaType:

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

 exptUeBehav:

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

 reptThlds:

 type: array

 items:

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

 minItems: 1

 TargetUeId:

 type: object

 properties:

 anyUeInd:

 type: boolean

 gpsi:

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

 exterGroupId:

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

 UeMobilityExposure:

 type: object

 properties:

 gpsi:

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

 ueTrajs:

 type: array

 items:

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

 minItems: 1

 required:

 - ueTrajs

 UeTrajectoryInfo:

 type: object

 properties:

 ts:

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

 recurringTime:

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

 duration:

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

 locInfo:

 type: array

 items:

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

 minItems: 1

 required:

 - duration

 - locInfo

 UeLocationInfo:

 type: object

 properties:

 loc:

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

 ratio:

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

 confidence:

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

 required:

 - loc

 UeCommunicationExposure:

 type: object

 properties:

 gpsi:

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

 comms:

 type: array

 items:

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

 minItems: 1

 required:

 - comms

 AnalyticsRequest:

 type: object

 properties:

 analyEvent:

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

 analyEventFilter:

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

 analyRep:

 $ref: 'TS29520\_Nnwdaf\_AnalyticsInfo.yaml#/components/schemas/AnalyticsReportingRequirement'

 tgtUe:

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

 suppFeat:

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

 required:

 - analyEvent

 - tgtUe

 - suppFeat

 AnalyticsEventFilter:

 type: object

 properties:

 locArea:

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

 maxAnaEntry:

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

 appIds:

 type: array

 items:

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

 minItems: 1

 excepIds:

 type: array

 items:

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

 minItems: 1

 exptAnaType:

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

 exptUeBehav:

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

 AnalyticsData:

 type: object

 properties:

 ueMobilityInfos:

 type: array

 items:

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

 minItems: 1

 ueCommInfos:

 type: array

 items:

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

 minItems: 1

 suppFeat:

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

 required:

 - suppFeat

 AnalyticsEvent:

 anyOf:

 - type: string

 enum:

 - UE\_MOBILITY

 - UE\_COMM

 - ABNORMAL\_BEHAVIOR

 - CONGESTION

 - 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: >

 Possible values are

 - UE\_MOBILITY: The AF requests to be notified about analytics information of UE mobility.

 - UE\_COMM: The AF requests to be notified about analytics information of UE communication.

 - ABNORMAL\_BEHAVIOR: The AF requests to be notified about analytics information of UE’s abnormal behavior.

 - CONGESTION: The AF requests to be notified about analytics information of user data congestion information.

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