**3GPP TSG-CT3 Meeting #122e C3-223715**

**E-Meeting, 12th – 20th May 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.520** | **CR** | **0538** | **rev** | **-** | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **x** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Update of info and externalDocs fields | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Mobile | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 7 | | | | |  | ***Date:*** | | | 2022-05-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | CRs modifying the Nnwdaf\_EventsSubscription API, Nnwdaf\_AnalyticsInfo API and Nnwdaf\_MLModelProvision API have been agreed and the version number of the corresponding OpenAPI file thus needs to be incremented following the rules in 3GPP TS 29.501, clause 4.3.1.  The following agreed CRs update the OpenAPI file for Nnwdaf\_EventsSubscription API for the present release:   * CR#0435 impacts the OpenAPI file with a backwards compatible feature. * CR#0443 impacts the OpenAPI file with a backwards compatible feature. * CR#0453 impacts the OpenAPI file with a backwards compatible correction. * CR#0454 impacts the OpenAPI file with a backwards compatible correction. * CR#0457 impacts the OpenAPI file with a backwards compatible feature. * CR#0464 impacts the OpenAPI file with a backwards compatible feature. * CR#0465 impacts the OpenAPI file with a backwards compatible feature. * CR#0470 impacts the OpenAPI file with a backwards compatible feature. * CR#0474 impacts the OpenAPI file with a backwards compatible feature. * CR#0481 impacts the OpenAPI file with a backwards compatible feature. * CR#0483 impacts the OpenAPI file with a backwards compatible feature. * CR#0499 impacts the OpenAPI file with a backwards compatible feature. * CR#0501 impacts the OpenAPI file with a backwards compatible correction. * CR#0504 impacts the OpenAPI file with a backwards compatible correction. * CR#0507 impacts the OpenAPI file with a backwards compatible correction. * CR#0509 impacts the OpenAPI file with a backwards compatible correction. * CR#0510 impacts the OpenAPI file with a backwards compatible correction. * CR#0512 impacts the OpenAPI file with a backwards compatible correction. * CR#0514 impacts the OpenAPI file with a backwards compatible correction. * CR#0516 impacts the OpenAPI file with a backwards compatible correction. * CR#0519 impacts the OpenAPI file with a backwards compatible feature. * CR#0520 impacts the OpenAPI file with a backwards compatible feature. * CR#0521 impacts the OpenAPI file with a backwards compatible correction. * CR#0522 impacts the OpenAPI file with a backwards compatible feature. * CR#0523 impacts the OpenAPI file with a backwards compatible correction. * CR#0524 impacts the OpenAPI file with a backwards compatible correction. * CR#0537 impacts the OpenAPI file with a backwards compatible correction. * CR#0354 of 3GPP TS 29.571 impacts the OpenAPI file with a backwards compatible correction.   As some backward compatible corrections and features (but no backward incompatible changes or backward compatible new features) are added of the present release, and the release will be frozen, the draft version number is removed.  The following agreed CRs update the OpenAPI file for Nnwdaf\_AnalyticsInfo API for the present release:   * CR#0430 impacts the OpenAPI file with a backwards compatible feature. * CR#0438 impacts the OpenAPI file with a backwards compatible feature. * CR#0447 impacts the OpenAPI file with a backwards compatible correction. * CR#0455 impacts the OpenAPI file with a backwards compatible correction. * CR#0458 impacts the OpenAPI file with a backwards compatible feature. * CR#0500 impacts the OpenAPI file with a backwards compatible correction. * CR#0503 impacts the OpenAPI file with a backwards compatible correction. * CR#0517 impacts the OpenAPI file with a backwards compatible correction. * CR#0520 impacts the OpenAPI file with a backwards compatible feature. * CR#0536 impacts the OpenAPI file with a backwards compatible correction. * CR#0354 of 3GPP TS 29.571 impacts the OpenAPI file with a backwards compatible correction.   As some backward compatible corrections and features (but no backward incompatible changes or backward compatible new features) are added of the present release, and the release will be frozen, the draft version number is removed.  The following agreed CRs update the OpenAPI file for Nnwdaf\_MLModelProvision API for the present release:   * CR#0472 impacts the OpenAPI file with a backwards compatible correction. * CR#0473 impacts the OpenAPI file with a backwards compatible correction. * CR#0504 impacts the OpenAPI file with a backwards compatible correction. * CR#0505 impacts the OpenAPI file with a backwards compatible correction. * CR#0520 impacts the OpenAPI file with a backwards compatible feature. * CR#0537 impacts the OpenAPI file with a backwards compatible correction. * CR#0354 of 3GPP TS 29.571 impacts the OpenAPI file with a backwards compatible correction.   As some backward compatible corrections and features (but no backward incompatible changes or backward compatible new features) are added of the present release, and the release will be frozen, the draft version number is removed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The Nnwdaf\_EventsSubscription API version incremented from value "1.2.0-alpha.7" to value "1.2.0", and the TS version in the externalDocs field from 17.6.0 to 17.7.0.  The Nnwdaf\_AnalyticsInfo API version incremented from value "1.2.0-alpha.6" to value "1.2.0", and the TS version in the externalDocs field from 17.6.0 to 17.7.0.  The Nnwdaf\_MLModelProvision API version incremented from value "1.2.0-alpha.2" to value "1.2.0", and the TS version in the externalDocs field from 17.6.0 to 17.7.0. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incorrect API version number and TS version in externalDocs field. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.2, A.3, A.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR introduces backward compatible corrections to Nnwdaf\_EventsSubscription API , Nnwdaf\_AnalyticsInfo API and Nnwdaf\_MLModelProvision API . | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\* First Change \*\*\*

# A.2 Nnwdaf\_EventsSubscription API

openapi: 3.0.0

info:

version: 1.2.0

title: Nnwdaf\_EventsSubscription

description: |

Nnwdaf\_EventsSubscription Service API.

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externalDocs:

description: 3GPP TS 29.520 V17.7.0; 5G System; Network Data Analytics Services.

url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.520/'

security:

- {}

- oAuth2ClientCredentials:

- nnwdaf-eventssubscription

servers:

- url: '{apiRoot}/nnwdaf-eventssubscription/v1'

variables:

apiRoot:

default: https://example.com

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

paths:

/subscriptions:

post:

summary: Create a new Individual NWDAF Events Subscription

operationId: CreateNWDAFEventsSubscription

tags:

- NWDAF Events Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: Create a new Individual NWDAF Event Subscription resource.

headers:

Location:

description: 'Contains the URI of the newly created resource, according to the structure: {apiRoot}/nnwdaf-eventssubscription/v1/subscriptions/{subscriptionId}'

required: true

schema:

type: string

content:

application/json:

schema:

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

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

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

'500':

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

'503':

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

default:

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

callbacks:

myNotification:

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

post:

requestBody:

required: true

content:

application/json:

schema:

type: array

items:

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

minItems: 1

responses:

'204':

description: The receipt of the Notification is acknowledged.

'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'

'503':

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

default:

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

/subscriptions/{subscriptionId}:

delete:

summary: Delete an existing Individual NWDAF Events Subscription

operationId: DeleteNWDAFEventsSubscription

tags:

- Individual NWDAF Events Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Nnwdaf\_EventsSubscription Service

required: true

schema:

type: string

responses:

'204':

description: No Content. The Individual NWDAF Event Subscription resource matching the subscriptionId was 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':

description: The Individual NWDAF Event Subscription resource does not exist.

content:

application/problem+json:

schema:

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

'429':

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

'500':

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

'501':

$ref: 'TS29571\_CommonData.yaml#/components/responses/501'

'503':

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

default:

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

put:

summary: Update an existing Individual NWDAF Events Subscription

operationId: UpdateNWDAFEventsSubscription

tags:

- Individual NWDAF Events Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

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

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Nnwdaf\_EventsSubscription Service

required: true

schema:

type: string

responses:

'200':

description: The Individual NWDAF Event Subscription resource was modified successfully and a representation of that resource is returned.

content:

application/json:

schema:

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

'204':

description: The Individual NWDAF Event Subscription resource was modified successfully.

'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':

description: The Individual NWDAF Event Subscription resource does not exist.

content:

application/problem+json:

schema:

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

'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'

'501':

$ref: 'TS29571\_CommonData.yaml#/components/responses/501'

'503':

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

default:

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

/transfers:

post:

summary: Provide information about requested analytics subscriptions transfer and potentially create a new Individual NWDAF Event Subscription Transfer resource.

operationId: CreateNWDAFEventSubscriptionTransfer

tags:

- NWDAF Event Subscription Transfers (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: Create a new Individual NWDAF Event Subscription Transfer resource.

headers:

Location:

description: 'Contains the URI of the newly created resource, according to the structure: {apiRoot}/nnwdaf-eventssubscription/v1/transfers/{transferId}'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

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

'500':

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

'503':

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

default:

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

/transfers/{transferId}:

delete:

summary: Delete an existing Individual NWDAF Event Subscription Transfer

operationId: DeleteNWDAFEventSubscriptionTransfer

tags:

- Individual NWDAF Event Subscription Transfer (Document)

parameters:

- name: transferId

in: path

description: String identifying a request for an analytics subscription transfer to the Nnwdaf\_EventsSubscription Service

required: true

schema:

type: string

responses:

'204':

description: No Content. The Individual NWDAF Event Subscription Transfer resource matching the transferId was 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'

'501':

$ref: 'TS29571\_CommonData.yaml#/components/responses/501'

'503':

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

default:

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

put:

summary: Update an existing Individual NWDAF Event Subscription Transfer

operationId: UpdateNWDAFEventSubscriptionTransfer

tags:

- Individual NWDAF Event Subscription Transfer (Document)

requestBody:

required: true

content:

application/json:

schema:

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

parameters:

- name: transferId

in: path

description: String identifying a request for an analytics subscription transfer to the Nnwdaf\_EventsSubscription Service

required: true

schema:

type: string

responses:

'204':

description: The Individual NWDAF Event Subscription Transfer resource was modified successfully.

'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'

'501':

$ref: 'TS29571\_CommonData.yaml#/components/responses/501'

'503':

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

default:

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

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{nrfApiRoot}/oauth2/token'

scopes:

nnwdaf-eventssubscription: Access to the Nnwdaf\_EventsSubscription API

schemas:

NnwdafEventsSubscription:

description: Represents an Individual NWDAF Event Subscription resource.

type: object

properties:

eventSubscriptions:

type: array

items:

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

minItems: 1

description: Subscribed events

evtReq:

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

notificationURI:

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

supportedFeatures:

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

eventNotifications:

type: array

items:

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

minItems: 1

failEventReports:

type: array

items:

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

minItems: 1

prevSub:

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

consNfInfo:

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

required:

- eventSubscriptions

EventSubscription:

description: Represents a subscription to a single event.

type: object

properties:

anySlice:

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

appIds:

type: array

items:

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

minItems: 1

description: Identification(s) of application to which the subscription applies.

dnns:

type: array

items:

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

minItems: 1

description: Identification(s) of DNN to which the subscription applies.

dnais:

type: array

items:

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

minItems: 1

event:

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

extraReportReq:

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

ladnDnns:

type: array

items:

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

minItems: 1

description: Identification(s) of LADN DNN to indicate the LADN service area as the AOI.

loadLevelThreshold:

type: integer

description: Indicates that the NWDAF shall report the corresponding network slice load level to the NF service consumer where the load level of the network slice identified by snssais is reached.

notificationMethod:

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

matchingDir:

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

nfLoadLvlThds:

type: array

items:

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

minItems: 1

description: Shall be supplied in order to start reporting when an average load level is reached.

nfInstanceIds:

type: array

items:

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

minItems: 1

nfSetIds:

type: array

items:

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

minItems: 1

nfTypes:

type: array

items:

$ref: 'TS29510\_Nnrf\_NFManagement.yaml#/components/schemas/NFType'

minItems: 1

networkArea:

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

visitedAreas:

type: array

items:

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

minItems: 1

maxTopAppUlNbr:

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

description: Indicates the requested maximum number of top applications that contribute the most to the traffic in Uplink direction.

maxTopAppDlNbr:

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

description: Indicates the requested maximum number of top applications that contribute the most to the traffic in Downlink direction.

nsiIdInfos:

type: array

items:

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

minItems: 1

nsiLevelThrds:

type: array

items:

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

minItems: 1

qosRequ:

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

qosFlowRetThds:

type: array

items:

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

minItems: 1

ranUeThrouThds:

type: array

items:

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

minItems: 1

repetitionPeriod:

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

snssaia:

type: array

items:

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

minItems: 1

description: Identification(s) of network slice to which the subscription applies. It corresponds to snssais in the data model definition of 3GPP TS 29.520.

tgtUe:

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

congThresholds:

type: array

items:

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

minItems: 1

nwPerfRequs:

type: array

items:

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

minItems: 1

bwRequs:

type: array

items:

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

minItems: 1

excepRequs:

type: array

items:

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

minItems: 1

exptAnaType:

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

exptUeBehav:

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

ratTypes:

type: array

items:

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

minItems: 1

freqs:

type: array

items:

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

minItems: 1

listOfAnaSubsets:

type: array

items:

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

minItems: 1

disperReqs:

type: array

items:

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

minItems: 1

redTransReqs:

type: array

items:

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

minItems: 1

wlanReqs:

type: array

items:

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

minItems: 1

upfId:

type: string

description: Identifies the UPF.

appServerAddrs:

type: array

items:

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

minItems: 1

dnPerfReqs:

type: array

items:

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

minItems: 1

required:

- event

NnwdafEventsSubscriptionNotification:

description: Represents an Individual NWDAF Event Subscription Notification resource.

type: object

properties:

eventNotifications:

type: array

items:

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

minItems: 1

description: Notifications about Individual Events

subscriptionId:

type: string

description: String identifying a subscription to the Nnwdaf\_EventsSubscription Service

required:

- eventNotifications

- subscriptionId

EventNotification:

description: Represents a notification on events that occurred.

type: object

properties:

event:

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

start:

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

expiry:

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

timeStampGen:

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

failNotifyCode:

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

rvWaitTime:

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

anaMetaInfo:

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

nfLoadLevelInfos:

type: array

items:

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

minItems: 1

nsiLoadLevelInfos:

type: array

items:

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

minItems: 1

sliceLoadLevelInfo:

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

svcExps:

type: array

items:

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

minItems: 1

qosSustainInfos:

type: array

items:

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

minItems: 1

ueComms:

type: array

items:

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

minItems: 1

ueMobs:

type: array

items:

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

minItems: 1

userDataCongInfos:

type: array

items:

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

minItems: 1

abnorBehavrs:

type: array

items:

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

minItems: 1

nwPerfs:

type: array

items:

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

minItems: 1

dnPerfInfos:

type: array

items:

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

minItems: 1

disperInfos:

type: array

items:

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

minItems: 1

redTransInfos:

type: array

items:

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

minItems: 1

wlanInfos:

type: array

items:

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

minItems: 1

required:

- event

ServiceExperienceInfo:

description: Represents service experience information.

type: object

properties:

svcExprc:

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

svcExprcVariance:

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

supis:

type: array

items:

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

minItems: 1

snssai:

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

appId:

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

srvExpcType:

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

confidence:

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

dnn:

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

networkArea:

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

nsiId:

$ref: 'TS29531\_Nnssf\_NSSelection.yaml#/components/schemas/NsiId'

ratio:

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

ratType:

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

frequency:

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

required:

- svcExprc

BwRequirement:

description: Represents bandwidth requirements.

type: object

properties:

appId:

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

marBwDl:

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

marBwUl:

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

mirBwDl:

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

mirBwUl:

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

required:

- appId

SliceLoadLevelInformation:

description: Contains load level information applicable for one or several slices.

type: object

properties:

loadLevelInformation:

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

snssais:

type: array

items:

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

minItems: 1

description: Identification(s) of network slice to which the subscription applies.

numOfUes:

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

numOfPduSess:

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

exceedLoadLevelThrInd:

type: boolean

confidence:

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

required:

- loadLevelInformation

- snssais

NsiLoadLevelInfo:

description: Represents the network slice and optionally the associated network slice instance and the load level information.

type: object

properties:

loadLevelInformation:

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

snssai:

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

nsiId:

$ref: 'TS29531\_Nnssf\_NSSelection.yaml#/components/schemas/NsiId'

resUsage:

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

numOfExceedLoadLevelThr:

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

exceedLoadLevelThrInd:

type: boolean

networkArea:

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

timePeriod:

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

numOfUes:

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

numOfPduSess:

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

confidence:

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

required:

- loadLevelInformation

- snssai

NsiIdInfo:

description: Represents the S-NSSAI and the optionally associated Network Slice Instance(s).

type: object

properties:

snssai:

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

nsiIds:

type: array

items:

$ref: 'TS29531\_Nnssf\_NSSelection.yaml#/components/schemas/NsiId'

minItems: 1

required:

- snssai

EventReportingRequirement:

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

type: object

properties:

accuracy:

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

accPerSubset:

type: array

items:

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

minItems: 1

description: >

Each element indicates the preferred accuracy level per analytics subset. It may be

present if the "listOfAnaSubsets" attribute is present in the subscription request when

the subscription event is NF\_LOAD, UE\_COMM, DISPERSION, NETWORK\_PERFORMANCE,

WLAN\_PERFORMANCE, DN\_PERFORMANCE or SERVICE\_EXPERIENCE.

startTs:

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

endTs:

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

offsetPeriod:

type: integer

description: Offset period in units of seconds to the reporting time, if the value is negative means statistics in the past offset period, otherwise a positive value means prediction in the future offset period. May be present if the "repPeriod" attribute is included within the "evtReq" attribute.

sampRatio:

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

maxObjectNbr:

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

maxSupiNbr:

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

timeAnaNeeded:

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

anaMeta:

type: array

items:

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

minItems: 1

anaMetaInd:

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

TargetUeInformation:

description: Identifies the target UE information.

type: object

properties:

anyUe:

type: boolean

supis:

type: array

items:

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

gpsis:

type: array

items:

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

intGroupIds:

type: array

items:

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

UeMobility:

description: Represents UE mobility information.

type: object

properties:

ts:

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

recurringTime:

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

duration:

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

durationVariance:

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

locInfos:

type: array

items:

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

minItems: 1

required:

- duration

- locInfos

LocationInfo:

description: Represents UE location information.

type: object

properties:

loc:

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

ratio:

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

confidence:

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

required:

- loc

UeCommunication:

description: Represents UE communication information.

type: object

properties:

commDur:

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

commDurVariance:

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

perioTime:

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

perioTimeVariance:

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

ts:

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

tsVariance:

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

recurringTime:

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

trafChar:

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

ratio:

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

perioCommInd:

type: boolean

confidence:

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

anaOfAppList:

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

sessInactTimer:

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

required:

- commDur

- trafChar

TrafficCharacterization:

description: Identifies the detailed traffic characterization.

type: object

properties:

dnn:

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

snssai:

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

appId:

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

fDescs:

type: array

items:

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

minItems: 1

maxItems: 2

ulVol:

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

ulVolVariance:

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

dlVol:

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

dlVolVariance:

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

UserDataCongestionInfo:

description: Represents the user data congestion information.

type: object

properties:

networkArea:

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

congestionInfo:

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

snssai:

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

CongestionInfo:

description: Represents the congestion information.

type: object

properties:

congType:

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

timeIntev:

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

nsi:

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

confidence:

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

topAppListUl:

type: array

items:

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

minItems: 1

topAppListDl:

type: array

items:

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

minItems: 1

required:

- congType

- timeIntev

- nsi

TopApplication:

description: Top application that contributes the most to the traffic.

type: object

properties:

appId:

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

ipTrafficFilter:

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

ratio:

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

QosSustainabilityInfo:

description: Represents the QoS Sustainability information.

type: object

properties:

areaInfo:

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

startTs:

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

endTs:

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

qosFlowRetThd:

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

ranUeThrouThd:

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

snssai:

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

confidence:

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

QosRequirement:

description: Represents the QoS requirements.

type: object

properties:

5qi:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/5Qi'

gfbrUl:

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

gfbrDl:

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

resType:

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

pdb:

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

per:

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

ThresholdLevel:

description: Represents a threshold level.

type: object

properties:

congLevel:

type: integer

nfLoadLevel:

type: integer

nfCpuUsage:

type: integer

nfMemoryUsage:

type: integer

nfStorageUsage:

type: integer

avgTrafficRate:

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

maxTrafficRate:

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

avgPacketDelay:

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

maxPacketDelay:

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

avgPacketLossRate:

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

NfLoadLevelInformation:

description: Represents load level information of a given NF instance.

type: object

properties:

nfType:

$ref: 'TS29510\_Nnrf\_NFManagement.yaml#/components/schemas/NFType'

nfInstanceId:

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

nfSetId:

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

nfStatus:

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

nfCpuUsage:

type: integer

nfMemoryUsage:

type: integer

nfStorageUsage:

type: integer

nfLoadLevelAverage:

type: integer

nfLoadLevelpeak:

type: integer

nfLoadAvgInAoi:

type: integer

snssai:

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

confidence:

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

required:

- nfType

- nfInstanceId

NfStatus:

description: Contains the percentage of time spent on various NF states.

type: object

properties:

statusRegistered:

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

statusUnregistered:

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

statusUndiscoverable:

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

AnySlice:

type: boolean

description: FALSE represents not applicable for all slices. TRUE represents applicable for all slices.

LoadLevelInformation:

type: integer

description: Load level information of the network slice and the optionally associated network slice instance.

AbnormalBehaviour:

description: Represents the abnormal behaviour information.

type: object

properties:

supis:

type: array

items:

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

minItems: 1

excep:

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

dnn:

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

snssai:

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

ratio:

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

confidence:

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

addtMeasInfo:

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

required:

- excep

Exception:

description: Represents the Exception information.

type: object

properties:

excepId:

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

excepLevel:

type: integer

excepTrend:

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

required:

- excepId

AdditionalMeasurement:

description: Represents additional measurement information.

type: object

properties:

unexpLoc:

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

unexpFlowTeps:

type: array

items:

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

minItems: 1

unexpWakes:

type: array

items:

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

minItems: 1

ddosAttack:

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

wrgDest:

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

circums:

type: array

items:

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

minItems: 1

IpEthFlowDescription:

description: Contains the description of an Uplink and/or Downlink Ethernet flow.

type: object

properties:

ipTrafficFilter:

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

ethTrafficFilter:

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

AddressList:

description: Represents a list of IPv4 and/or IPv6 addresses.

type: object

properties:

ipv4Addrs:

type: array

items:

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

minItems: 1

ipv6Addrs:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

minItems: 1

CircumstanceDescription:

description: Contains the description of a circumstance.

type: object

properties:

freq:

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

tm:

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

locArea:

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

vol:

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

RetainabilityThreshold:

description: Represents a QoS flow retainability threshold.

type: object

properties:

relFlowNum:

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

relTimeUnit:

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

relFlowRatio:

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

NetworkPerfRequirement:

description: Represents a network performance requirement.

type: object

properties:

nwPerfType:

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

relativeRatio:

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

absoluteNum:

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

required:

- nwPerfType

NetworkPerfInfo:

description: Represents the network performance information.

type: object

properties:

networkArea:

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

nwPerfType:

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

relativeRatio:

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

absoluteNum:

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

confidence:

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

required:

- networkArea

- nwPerfType

FailureEventInfo:

description: Contains information on the event for which the subscription is not successful.

type: object

properties:

event:

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

failureCode:

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

required:

- event

- failureCode

AnalyticsMetadataIndication:

description: Contains analytics metadata information requested to be used during analytics generation.

type: object

properties:

dataWindow:

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

dataStatProps:

type: array

items:

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

minItems: 1

strategy:

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

aggrNwdafIds:

type: array

items:

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

minItems: 1

AnalyticsMetadataInfo:

description: Contains analytics metadata information required for analytics aggregation.

type: object

properties:

numSamples:

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

dataWindow:

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

dataStatProps:

type: array

items:

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

minItems: 1

strategy:

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

accuracy:

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

NumberAverage:

description: Represents average and variance information.

type: object

properties:

number:

type: integer

variance:

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

required:

- number

- variance

AnalyticsSubscriptionsTransfer:

description: Contains information about a request to transfer analytics subscriptions.

type: object

properties:

subsTransInfos:

type: array

items:

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

minItems: 1

required:

- subsTransInfos

SubscriptionTransferInfo:

description: Contains information about subscriptions that are requested to be transferred.

type: object

properties:

transReqType:

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

nwdafEvSub:

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

consumerId:

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

contextId:

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

sourceNfIds:

type: array

items:

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

minItems: 1

sourceSetIds:

type: array

items:

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

minItems: 1

modelInfo:

type: array

items:

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

minItems: 1

modelProvIds:

type: array

items:

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

minItems: 1

required:

- transReqType

- nwdafEvSub

- consumerId

ModelInfo:

description: Contains information about an ML model.

type: object

properties:

analyticsId:

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

mlFileAddr:

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

required:

- analyticsId

- mlFileAddr

AnalyticsContextIdentifier:

description: Contains information about available analytics contexts.

type: object

properties:

subscriptionId:

type: string

description: The identifier of a subscription.

nfAnaCtxts:

type: array

items:

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

minItems: 1

description: List of analytics types for which NF related analytics contexts can be retrieved.

ueAnaCtxts:

type: array

items:

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

minItems: 1

description: List of objects that indicate for which SUPI and analytics types combinations analytics context can be retrieved.

allOf:

- anyOf:

- required: [nfAnaCtxts]

- required: [ueAnaCtxts]

- required: [subscriptionId]

UeAnalyticsContextDescriptor:

description: Contains information about available UE related analytics contexts.

type: object

properties:

supi:

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

anaTypes:

type: array

items:

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

minItems: 1

description: List of analytics types for which UE related analytics contexts can be retrieved.

required:

- supi

- anaTypes

DnPerfInfo:

description: Represents DN performance information.

type: object

properties:

appId:

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

dnn:

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

snssai:

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

dnPerf:

type: array

items:

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

minItems: 1

confidence:

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

required:

- dnPerf

DnPerf:

description: Represents DN performance for the application.

type: object

properties:

appServerInsAddr:

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

upfId:

type: string

description: Identifies the UPF.

dnai:

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

perfData:

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

spatialValidCon:

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

temporalValidCon:

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

PerfData:

description: Represents DN performance data.

type: object

properties:

avgTrafficRate:

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

maxTrafficRate:

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

avePacketDelay:

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

maxPacketDelay:

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

avgPacketLossRate:

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

DispersionRequirement:

description: Represents the dispersion analytics requirements.

type: object

properties:

disperType:

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

classCriters:

type: array

items:

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

minItems: 1

rankCriters:

type: array

items:

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

minItems: 1

dispOrderCriter:

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

order:

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

required:

- disperType

ClassCriterion:

description: Indicates the dispersion class criterion for fixed, camper and/or traveller UE, and/or the top-heavy UE dispersion class criterion.

type: object

properties:

disperClass:

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

classThreshold:

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

thresMatch:

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

required:

- disperClass

- classThreshold

- thresMatch

RankingCriterion:

description: Indicates the usage ranking criterion between the high, medium and low usage UE.

type: object

properties:

highBase:

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

lowBase:

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

required:

- highBase

- mediumBase

DispersionInfo:

description: Represents the Dispersion information. When subscribed event is "DISPERSION", the "disperInfos" attribute shall be included.

type: object

properties:

tsStart:

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

tsDuration:

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

disperCollects:

type: array

items:

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

minItems: 1

disperType:

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

required:

- tsStart

- tsDuration

- disperCollects

- disperType

DispersionCollection:

description: Dispersion collection per UE location or per slice.

type: object

properties:

ueLoc:

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

snssai:

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

supis:

type: array

items:

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

minItems: 1

gpsis:

type: array

items:

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

minItems: 1

appVolumes:

type: array

items:

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

minItems: 1

disperAmount:

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

disperClass:

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

usageRank:

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

minimum: 1

maximum: 3

percentileRank:

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

ueRatio:

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

confidence:

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

oneOf:

- required: [ueLoc]

- required: [snssai]

ApplicationVolume:

description: Application data volume per Application Id.

type: object

properties:

appId:

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

appVolume:

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

required:

- appId

- appVolume

RedundantTransmissionExpReq:

description: Represents other redundant transmission experience analytics requirements.

type: object

properties:

redTOrderCriter:

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

order:

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

RedundantTransmissionExpInfo:

description: The redundant transmission experience related information. When subscribed event is "RED\_TRANS\_EXP", the "redTransInfos" attribute shall be included.

type: object

properties:

spatialValidCon:

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

dnn:

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

redTransExps:

type: array

items:

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

minItems: 1

required:

- redTransExps

RedundantTransmissionExpPerTS:

description: The redundant transmission experience per Time Slot.

type: object

properties:

tsStart:

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

tsDuration:

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

redTransExp:

type: string

ueRatio:

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

confidence:

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

required:

- tsStart

- tsDuration

- redTransExp

WlanPerformanceReq:

description: Represents other WLAN performance analytics requirements.

type: object

properties:

ssIds:

type: array

items:

type: string

minItems: 1

bssIds:

type: array

items:

type: string

minItems: 1

wlanOrderCriter:

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

order:

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

WlanPerformanceInfo:

description: The WLAN performance related information.

type: object

properties:

networkArea:

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

wlanPerSsidInfos:

type: array

items:

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

minItems: 1

required:

- wlanPerSsidInfos

WlanPerSsIdPerformanceInfo:

description: The WLAN performance per SSID.

type: object

properties:

ssId:

type: string

wlanPerTsInfos:

type: array

items:

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

minItems: 1

required:

- ssId

- wlanPerTsInfos

WlanPerTsPerformanceInfo:

description: WLAN performance information per Time Slot during the analytics target period.

type: object

properties:

tsStart:

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

tsDuration:

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

rssi:

type: integer

rtt:

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

trafficInfo:

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

numberOfUes:

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

confidence:

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

required:

- tsStart

- tsDuration

anyOf:

- required: [rssi]

- required: [rtt]

- required: [trafficInfo]

- required: [numberOfUes]

TrafficInformation:

description: Traffic information including UL/DL data rate and/or Traffic volume.

type: object

properties:

uplinkRate:

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

downlinkRate:

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

uplinkVolume:

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

downlinkVolume:

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

totalVolume:

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

anyOf:

- required: [uplinkRate]

- required: [downlinkRate]

- required: [uplinkVolume]

- required: [downlinkVolume]

- required: [totalVolume]

AppListForUeComm:

description: Represents the analytics of the application list used by UE.

type: object

properties:

appId:

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

startTime:

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

appDur:

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

occurRatio:

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

spatialValidity:

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

confidence:

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

SessInactTimerForUeComm:

description: Represents the N4 Session inactivity timer.

type: object

properties:

N4SessId:

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

sessInactiveTimer:

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

confidence:

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

DnPerformanceReq:

description: Represents other DN performance analytics requirements.

type: object

properties:

dnPerfOrderCriter:

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

order:

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

reportThresholds:

type: array

items:

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

minItems: 1

#

# ENUMERATIONS DATA TYPES

#

ResourceUsage:

description: The current usage of the virtual resources assigned to the NF instances belonging to a particular network slice instance.

type: object

properties:

cpuUsage:

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

memoryUsage:

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

storageUsage:

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

ConsumerNfInformation:

description: Represents the analytics consumer NF Information.

type: object

properties:

nfId:

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

taiList:

type: array

items:

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

minItems: 1

anyOf:

- required: [nfId]

- required: [taiList]

NotificationMethod:

anyOf:

- type: string

enum:

- PERIODIC

- THRESHOLD

- 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

- PERIODIC: The subscribe of NWDAF Event is periodically. The periodic of the notification is identified by repetitionPeriod defined in subclause 5.1.6.2.3.

- THRESHOLD: The subscribe of NWDAF Event is upon threshold exceeded.

NwdafEvent:

anyOf:

- type: string

enum:

- SLICE\_LOAD\_LEVEL

- NETWORK\_PERFORMANCE

- NF\_LOAD

- SERVICE\_EXPERIENCE

- UE\_MOBILITY

- UE\_COMMUNICATION

- QOS\_SUSTAINABILITY

- ABNORMAL\_BEHAVIOUR

- USER\_DATA\_CONGESTION

- NSI\_LOAD\_LEVEL

- DN\_PERFORMANCE

- DISPERSION

- RED\_TRANS\_EXP

- WLAN\_PERFORMANCE

- 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

- SLICE\_LOAD\_LEVEL: Indicates that the event subscribed is load level information of Network Slice

- NETWORK\_PERFORMANCE: Indicates that the event subscribed is network performance information.

- NF\_LOAD: Indicates that the event subscribed is load level and status of one or several Network Functions.

- SERVICE\_EXPERIENCE: Indicates that the event subscribed is service experience.

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

- UE\_COMMUNICATION: Indicates that the event subscribed is UE communication information.

- QOS\_SUSTAINABILITY: Indicates that the event subscribed is QoS sustainability.

- ABNORMAL\_BEHAVIOUR: Indicates that the event subscribed is abnormal behaviour.

- USER\_DATA\_CONGESTION: Indicates that the event subscribed is user data congestion information.

- NSI\_LOAD\_LEVEL: Indicates that the event subscribed is load level information of Network Slice and the optionally associated Network Slice Instance

- DN\_PERFORMANCE: Indicates that the event subscribed is DN performance information.

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

- RED\_TRANS\_EXP: Indicates that the event subscribed is redundant transmission experience.

- WLAN\_PERFORMANCE: Indicates that the event subscribed is WLAN performance.

Accuracy:

anyOf:

- type: string

enum:

- LOW

- HIGH

- 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

- LOW: Low accuracy.

- HIGH: High accuracy.

CongestionType:

anyOf:

- type: string

enum:

- USER\_PLANE

- CONTROL\_PLANE

- USER\_AND\_CONTROL\_PLANE

- 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

- USER\_PLANE: The congestion analytics type is User Plane.

- CONTROL\_PLANE: The congestion analytics type is Control Plane.

- USER\_AND\_CONTROL\_PLANE: The congestion analytics type is User Plane and Control Plane.

ExceptionId:

anyOf:

- type: string

enum:

- UNEXPECTED\_UE\_LOCATION

- UNEXPECTED\_LONG\_LIVE\_FLOW

- UNEXPECTED\_LARGE\_RATE\_FLOW

- UNEXPECTED\_WAKEUP

- SUSPICION\_OF\_DDOS\_ATTACK

- WRONG\_DESTINATION\_ADDRESS

- TOO\_FREQUENT\_SERVICE\_ACCESS

- UNEXPECTED\_RADIO\_LINK\_FAILURES

- PING\_PONG\_ACROSS\_CELLS

- 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

- UNEXPECTED\_UE\_LOCATION: Unexpected UE location

- UNEXPECTED\_LONG\_LIVE\_FLOW: Unexpected long-live rate flows

- UNEXPECTED\_LARGE\_RATE\_FLOW: Unexpected large rate flows

- UNEXPECTED\_WAKEUP: Unexpected wakeup

- SUSPICION\_OF\_DDOS\_ATTACK: Suspicion of DDoS attack

- WRONG\_DESTINATION\_ADDRESS: Wrong destination address

- TOO\_FREQUENT\_SERVICE\_ACCESS: Too frequent Service Access

- UNEXPECTED\_RADIO\_LINK\_FAILURES: Unexpected radio link failures

- PING\_PONG\_ACROSS\_CELLS: Ping-ponging across neighbouring cells

ExceptionTrend:

anyOf:

- type: string

enum:

- UP

- DOWN

- UNKNOW

- STABLE

- 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

- UP: Up trend of the exception level.

- DOWN: Down trend of the exception level.

- UNKNOW: Unknown trend of the exception level.

- STABLE: Stable trend of the exception level.

TimeUnit:

anyOf:

- type: string

enum:

- MINUTE

- HOUR

- DAY

- 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

- MINUTE: Time unit is per minute.

- HOUR: Time unit is per hour.

- DAY: Time unit is per day.

NetworkPerfType:

anyOf:

- type: string

enum:

- GNB\_ACTIVE\_RATIO

- GNB\_COMPUTING\_USAGE

- GNB\_MEMORY\_USAGE

- GNB\_DISK\_USAGE

- NUM\_OF\_UE

- SESS\_SUCC\_RATIO

- HO\_SUCC\_RATIO

- 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

- GNB\_ACTIVE\_RATIO: Indicates that the network performance requirement is gNodeB active (i.e. up and running) rate. Indicates the ratio of gNB active (i.e. up and running) number to the total number of gNB

- GNB\_COMPUTING\_USAGE: Indicates gNodeB computing resource usage.

- GNB\_MEMORY\_USAGE: Indicates gNodeB memory usage.

- GNB\_DISK\_USAGE: Indicates gNodeB disk usage.

- NUM\_OF\_UE: Indicates number of UEs.

- SESS\_SUCC\_RATIO: Indicates ratio of successful setup of PDU sessions to total PDU session setup attempts.

- HO\_SUCC\_RATIO: Indicates Ratio of successful handovers to the total handover attempts.

ExpectedAnalyticsType:

anyOf:

- type: string

enum:

- MOBILITY

- COMMUN

- MOBILITY\_AND\_COMMUN

- 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

- MOBILITY: Mobility related abnormal behaviour analytics is expected by the consumer.

- COMMUN: Communication related abnormal behaviour analytics is expected by the consumer.

- MOBILITY\_AND\_COMMUN: Both mobility and communication related abnormal behaviour analytics is expected by the consumer.

MatchingDirection:

anyOf:

- type: string

enum:

- ASCENDING

- DESCENDING

- CROSSED

- 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

- ASCENDING: Threshold is crossed in ascending direction.

- DESCENDING: Threshold is crossed in descending direction.

- CROSSED: Threshold is crossed either in ascending or descending direction.

NwdafFailureCode:

anyOf:

- type: string

enum:

- UNAVAILABLE\_DATA

- BOTH\_STAT\_PRED\_NOT\_ALLOWED

- UNSATISFIED\_REQUESTED\_ANALYTICS\_TIME

- OTHER

- 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

- UNAVAILABLE\_DATA: Indicates the requested statistics information for the event is rejected since necessary data to perform the service is unavailable.

- BOTH\_STAT\_PRED\_NOT\_ALLOWED: Indicates the requested analysis information for the event is rejected since the start time is in the past and the end time is in the future, which means the NF service consumer requested both statistics and prediction for the analytics.

- UNSATISFIED\_REQUESTED\_ANALYTICS\_TIME: Indicates that the requested event is rejected since the analytics information is not ready when the time indicated by the "timeAnaNeeded" attribute (as provided during the creation or modification of subscription) is reached.

- OTHER: Indicates the requested analysis information for the event is rejected due to other reasons.

AnalyticsMetadata:

anyOf:

- type: string

enum:

- NUM\_OF\_SAMPLES

- DATA\_WINDOW

- DATA\_STAT\_PROPS

- STRATEGY

- ACCURACY

- 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

- NUM\_OF\_SAMPLES: Number of data samples used for the generation of the output analytics.

- DATA\_WINDOW: Data time window of the data samples.

- DATA\_STAT\_PROPS: Dataset statistical properties of the data used to generate the analytics.

- STRATEGY: Output strategy used for the reporting of the analytics.

- ACCURACY: Level of accuracy reached for the analytics.

DatasetStatisticalProperty:

anyOf:

- type: string

enum:

- UNIFORM\_DIST\_DATA

- NO\_OUTLIERS

- 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

- UNIFORM\_DIST\_DATA: Indicates the use of data samples that are uniformly distributed according to the different aspects of the requested analytics.

- NO\_OUTLIERS: Indicates that the data samples shall disregard data samples that are at the extreme boundaries of the value range.

OutputStrategy:

anyOf:

- type: string

enum:

- BINARY

- GRADIENT

- 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

- BINARY: Indicates that the analytics shall only be reported when the requested level of accuracy is reached within a cycle of periodic notification.

- GRADIENT: Indicates that the analytics shall be reported according with the periodicity irrespective of whether the requested level of accuracy has been reached or not.

TransferRequestType:

anyOf:

- type: string

enum:

- PREPARE

- TRANSFER

- 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

- PREPARE: Indicates that the request is for analytics subscription transfer preparation.

- TRANSFER: Indicates that the request is for analytics subscription transfer execution.

AnalyticsSubset:

anyOf:

- type: string

enum:

- NUM\_OF\_UE\_REG

- NUM\_OF\_PDU\_SESS\_ESTBL

- RES\_USAGE

- NUM\_OF\_EXCEED\_RES\_USAGE\_LOAD\_LEVEL\_THR

- PERIOD\_OF\_EXCEED\_RES\_USAGE\_LOAD\_LEVEL\_THR

- EXCEED\_LOAD\_LEVEL\_THR\_IND

- LIST\_OF\_TOP\_APP\_UL

- LIST\_OF\_TOP\_APP\_DL

- NF\_STATUS

- NF\_RESOURCE\_USAGE

- NF\_LOAD

- NF\_PEAK\_LOAD

- DISPER\_AMOUNT

- DISPER\_CLASS

- RANKING

- PERCENTILE\_RANKING

- RSSI

- RTT

- TRAFFIC\_INFO

- NUMBER\_OF\_UES

- APP\_LIST\_FOR\_UE\_COMM

- N4\_SESS\_INACT\_TIMER\_FOR\_UE\_COMM

- AVG\_TRAFFIC\_RATE

- MAX\_TRAFFIC\_RATE

- AVG\_PACKET\_DELAY

- MAX\_PACKET\_DELAY

- AVG\_PACKET\_LOSS\_RATE

- 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

- NUM\_OF\_UE\_REG: The number of UE registered. This value is only applicable to NSI\_LOAD\_LEVEL event, SLICE\_LOAD\_LEVEL event and LOAD\_LEVEL\_INFORMATION event.

- NUM\_OF\_PDU\_SESS\_ESTBL: The number of PDU sessions established. This value is only applicable to NSI\_LOAD\_LEVEL event, SLICE\_LOAD\_LEVEL event and LOAD\_LEVEL\_INFORMATION event.

- RES\_USAGE: The current usage of the virtual resources assigned to the NF instances belonging to a particular network slice instance. This value is only applicable to NSI\_LOAD\_LEVEL event.

- NUM\_OF\_EXCEED\_RES\_USAGE\_LOAD\_LEVEL\_THR: The number of times the resource usage threshold of the network slice instance is reached or exceeded if a threshold value is provided by the consumer. This value is only applicable to NSI\_LOAD\_LEVEL event.

- PERIOD\_OF\_EXCEED\_RES\_USAGE\_LOAD\_LEVEL\_THR: The time interval between each time the threshold being met or exceeded on the network slice (instance). This value is only applicable to NSI\_LOAD\_LEVEL event.

- EXCEED\_LOAD\_LEVEL\_THR\_IND: Whether the Load Level Threshold is met or exceeded by the statistics value. This value is only applicable to NSI\_LOAD\_LEVEL event, SLICE\_LOAD\_LEVEL event and LOAD\_LEVEL\_INFORMATION event.

- LIST\_OF\_TOP\_APP\_UL: The list of applications that contribute the most to the traffic in the UL direction. This value is only applicable to USER\_DATA\_CONGESTION event.

- LIST\_OF\_TOP\_APP\_DL: The list of applications that contribute the most to the traffic in the DL direction. This value is only applicable to USER\_DATA\_CONGESTION event.

- NF\_STATUS: The availability status of the NF on the Analytics target period, expressed as a percentage of time per status value (registered, suspended, undiscoverable). This value is only applicable to NF\_LOAD event.

- NF\_RESOURCE\_USAGE: The average usage of assigned resources (CPU, memory, storage). This value is only applicable to NF\_LOAD event.

- NF\_LOAD: The average load of the NF instance over the Analytics target period. This value is only applicable to NF\_LOAD event.

- NF\_PEAK\_LOAD: The maximum load of the NF instance over the Analytics target period. This value is only applicable to NF\_LOAD event.

- DISPER\_AMOUNT: Indicates the dispersion amount of the reported data volume or transaction dispersion type. This value is only applicable to DISPERSION event.

- DISPER\_CLASS: Indicates the dispersion mobility class: fixed, camper, traveller upon set its usage threshold, and/or the top-heavy class upon set its percentile rating threshold. This value is only applicable to DISPERSION event.

- RANKING: Data/transaction usage ranking high (i.e.value 1), medium (2) or low (3). This value is only applicable to DISPERSION event.

- PERCENTILE\_RANKING: Percentile ranking of the target UE in the Cumulative Distribution Function of data usage for the population of all UEs. This value is only applicable to DISPERSION event.

- RSSI: Indicated the RSSI in the unit of dBm. This value is only applicable to WLAN\_PERFORMANCE event.

- RTT: Indicates the RTT in the unit of millisecond. This value is only applicable to WLAN\_PERFORMANCE event.

- TRAFFIC\_INFO: Traffic information including UL/DL data rate and/or Traffic volume. This value is only applicable to WLAN\_PERFORMANCE event.

- NUMBER\_OF\_UES: Number of UEs observed for the SSID. This value is only applicable to WLAN\_PERFORMANCE event.

- APP\_LIST\_FOR\_UE\_COMM: The analytics of the application list used by UE. This value is only applicable to UE\_COMM event.

- N4\_SESS\_INACT\_TIMER\_FOR\_UE\_COMM: The N4 Session inactivity timer. This value is only applicable to UE\_COMM event.

- AVG\_TRAFFIC\_RATE: Indicates average traffic rate. This value is only applicable to DN\_PERFORMANCE event.

- MAX\_TRAFFIC\_RATE: Indicates maximum traffic rate. This value is only applicable to DN\_PERFORMANCE event.

- AVG\_PACKET\_DELAY: Indicates average Packet Delay. This value is only applicable to DN\_PERFORMANCE event.

- MAX\_PACKET\_DELAY: Indicates maximum Packet Delay. This value is only applicable to DN\_PERFORMANCE event.

- AVG\_PACKET\_LOSS\_RATE: Indicates average Loss Rate. This value is only applicable to DN\_PERFORMANCE event.

DispersionType:

oneOf:

- type: string

enum:

- DVDA

- TDA

- DVDA\_AND\_TDA

- 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

- DVDA: Data Volume Dispersion Analytics.

- TDA: Transactions Dispersion Analytics.

- DVDA\_AND\_TDA: Data Volume Dispersion Analytics and Transactions Dispersion Analytics.

DispersionClass:

oneOf:

- type: string

enum:

- FIXED

- CAMPER

- TRAVELLER

- TOP\_HEAVY

- 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

- FIXED: Dispersion class as fixed UE its data or transaction usage at a location or a slice, is higher than its class threshold set for its all data or transaction usage.

- CAMPER: Dispersion class as camper UE, its data or transaction usage at a location or a slice, is higher than its class threshold and lower than the fixed class threshold set for its all data or transaction usage..

- TRAVELLER: Dispersion class as traveller UE, its data or transaction usage at a location or a slice, is lower than the camper class threshold set for its all data or transaction usage.

- TOP\_HEAVY: Dispersion class as Top\_Heavy UE, who's dispersion percentile rating at a location or a slice, is higher than its class threshold.

DispersionOrderingCriterion:

anyOf:

- type: string

enum:

- TIME\_SLOT\_START

- DISPERSION

- CLASSIFICATION

- RANKING

- PERCENTILE\_RANKING

- 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

- TIME\_SLOT\_START: Indicates the order of time slot start.

- DISPERSION: Indicates the order of data/transaction dispersion.

- CLASSIFICATION: Indicates the order of data/transaction classification.

- RANKING: Indicates the order of data/transaction ranking.

- PERCENTILE\_RANKING: Indicates the order of data/transaction percentile ranking.

RedTransExpOrderingCriterion:

anyOf:

- type: string

enum:

- TIME\_SLOT\_START

- RED\_TRANS\_EXP

- 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

- TIME\_SLOT\_START: Indicates the order of time slot start.

- RED\_TRANS\_EXP: Indicates the order of Redundant Transmission Experience.

WlanOrderingCriterion:

anyOf:

- type: string

enum:

- TIME\_SLOT\_START

- NUMBER\_OF\_UES

- RSSI

- RTT

- TRAFFIC\_INFO

- 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

- TIME\_SLOT\_START: Indicates the order of time slot start.

- NUMBER\_OF\_UES: Indicates the order of number of UEs.

- RSSI: Indicates the order of RSSI.

- RTT: Indicates the order of RTT.

- TRAFFIC\_INFO: Indicates the order of Traffic information.

ServiceExperienceType:

anyOf:

- type: string

enum:

- VOICE

- VIDEO

- 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

- VOICE: Indicates that the service experience analytics is for voice service.

- VIDEO: Indicates that the service experience analytics is for video service.

DnPerfOrderingCriterion:

anyOf:

- type: string

enum:

- AVERAGE\_TRAFFIC\_RATE

- MAXIMUM\_TRAFFIC\_RATE

- AVERAGE\_PACKET\_DELAY

- MAXIMUM\_PACKET\_DELAY

- AVERAGE\_PACKET\_LOSS\_RATE

- 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:

- AVERAGE\_TRAFFIC\_RATE: Indicates the average traffic rate.

- MAXIMUM\_TRAFFIC\_RATE: Indicates the maximum traffic rate.

- AVERAGE\_PACKET\_DELAY: Indicates the average packet delay.

- MAXIMUM\_PACKET\_DELAY: Indicates the maximum packet delay.

- AVERAGE\_PACKET\_LOSS\_RATE: Indicates the average packet loss rate.

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

# A.3 Nnwdaf\_AnalyticsInfo API

openapi: 3.0.0

info:

version: 1.2.0

title: Nnwdaf\_AnalyticsInfo

description: |

Nnwdaf\_AnalyticsInfo Service API.

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externalDocs:

description: 3GPP TS 29.520 V17.7.0; 5G System; Network Data Analytics Services.

url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.520/'

security:

- {}

- oAuth2ClientCredentials:

- nnwdaf-analyticsinfo

servers:

- url: '{apiRoot}/nnwdaf-analyticsinfo/v1'

variables:

apiRoot:

default: https://example.com

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

paths:

/analytics:

get:

summary: Read a NWDAF Analytics

operationId: GetNWDAFAnalytics

tags:

- NWDAF Analytics (Document)

parameters:

- name: event-id

in: query

description: Identify the analytics.

required: true

schema:

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

- name: ana-req

in: query

description: Identifies the analytics reporting requirement information.

required: false

content:

application/json:

schema:

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

- name: event-filter

in: query

description: Identify the analytics.

required: false

content:

application/json:

schema:

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

- name: supported-features

in: query

description: To filter irrelevant responses related to unsupported features

schema:

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

- name: tgt-ue

in: query

description: Identify the target UE information.

required: false

content:

application/json:

schema:

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

responses:

'200':

description: Containing the analytics with parameters as relevant for the requesting NF service consumer.

content:

application/json:

schema:

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

'204':

description: No Content (The request NWDAF Analytics data does not exist)

'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':

description: Indicates that the NWDAF Analytics resource does not exist.

content:

application/problem+json:

schema:

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

'406':

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

'414':

$ref: 'TS29571\_CommonData.yaml#/components/responses/414'

'429':

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

'500':

description: The request is rejected by the NWDAF and more details (not only the ProblemDetails) are returned.

content:

application/problem+json:

schema:

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

'503':

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

default:

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

/context:

get:

summary: Get context information related to analytics subscriptions.

operationId: GetNwdafContext

tags:

- NWDAF Context (Document)

parameters:

- name: context-ids

in: query

description: Identifies specific context information related to analytics subscriptions.

required: true

content:

application/json:

schema:

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

- name: req-context

in: query

description: Identfies the type(s) of the analytics context information the consumer wishes to receive.

required: false

content:

application/json:

schema:

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

responses:

'200':

description: Contains context information related to analytics subscriptions corresponding with one or more context identifiers.

content:

application/json:

schema:

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

'204':

description: No Content (No context information could be retrieved for the requested context identifiers).

'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'

'414':

$ref: 'TS29571\_CommonData.yaml#/components/responses/414'

'429':

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

'500':

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

'503':

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

default:

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

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{nrfApiRoot}/oauth2/token'

scopes:

nnwdaf-analyticsinfo: Access to the Nnwdaf\_AnalyticsInfo API

schemas:

AnalyticsData:

description: Represents the description of analytics with parameters as relevant for the requesting NF service consumer.

type: object

properties:

start:

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

expiry:

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

timeStampGen:

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

anaMetaInfo:

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

sliceLoadLevelInfos:

type: array

items:

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

minItems: 1

description: The slices and their load level information.

nsiLoadLevelInfos:

type: array

items:

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

minItems: 1

nfLoadLevelInfos:

type: array

items:

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

minItems: 1

nwPerfs:

type: array

items:

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

minItems: 1

svcExps:

type: array

items:

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

minItems: 1

qosSustainInfos:

type: array

items:

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

minItems: 1

ueMobs:

type: array

items:

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

minItems: 1

ueComms:

type: array

items:

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

minItems: 1

userDataCongInfos:

type: array

items:

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

minItems: 1

abnorBehavrs:

type: array

items:

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

minItems: 1

smccExps:

type: array

items:

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

minItems: 1

disperInfos:

type: array

items:

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

minItems: 1

redTransInfos:

type: array

items:

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

minItems: 1

wlanInfos:

type: array

items:

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

minItems: 1

dnPerfInfos:

type: array

items:

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

minItems: 1

suppFeat:

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

EventFilter:

description: Represents the event filters used to identify the requested analytics.

type: object

properties:

anySlice:

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

snssais:

type: array

items:

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

minItems: 1

description: Identification(s) of network slice to which the subscription belongs.

appIds:

type: array

items:

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

minItems: 1

dnns:

type: array

items:

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

minItems: 1

dnais:

type: array

items:

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

minItems: 1

ladnDnns:

type: array

items:

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

minItems: 1

description: Identification(s) of LADN DNN to indicate the LADN service area as the AOI.

networkArea:

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

visitedAreas:

type: array

items:

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

minItems: 1

maxTopAppUlNbr:

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

description: Indicates the requested maximum number of top applications that contribute the most to the traffic in Uplink direction.

maxTopAppDlNbr:

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

description: Indicates the requested maximum number that the list of top applications that contribute the most to the traffic in Downlink direction.

nfInstanceIds:

type: array

items:

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

minItems: 1

nfSetIds:

type: array

items:

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

minItems: 1

nfTypes:

type: array

items:

$ref: 'TS29510\_Nnrf\_NFManagement.yaml#/components/schemas/NFType'

minItems: 1

nsiIdInfos:

type: array

items:

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

minItems: 1

qosRequ:

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

nwPerfTypes:

type: array

items:

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

minItems: 1

bwRequs:

type: array

items:

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

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'

ratTypes:

type: array

items:

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

minItems: 1

freqs:

type: array

items:

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

minItems: 1

disperReqs:

type: array

items:

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

minItems: 1

redTransReqs:

type: array

items:

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

minItems: 1

wlanReqs:

type: array

items:

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

minItems: 1

listOfAnaSubsets:

type: array

items:

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

minItems: 1

upfId:

type: string

description: Identifies the UPF.

appServerAddrs:

type: array

items:

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

minItems: 1

dnPerfReqs:

type: array

items:

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

minItems: 1

not:

required: [anySlice, snssais]

ProblemDetailsAnalyticsInfoRequest:

description: Extends ProblemDetails to indicate more details why the analytics request is rejected.

allOf:

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

- $ref: '#/components/schemas/AdditionInfoAnalyticsInfoRequest'

AdditionInfoAnalyticsInfoRequest:

description: Indicates additional information why the analytics request is rejected.

type: object

properties:

rvWaitTime:

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

ContextData:

description: Contains context information related to analytics subscriptions corresponding with one or more context identifiers.

type: object

properties:

contextElems:

type: array

items:

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

minItems: 1

description: List of items that contain context information corresponding with a context identifier.

required:

- contextElems

ContextElement:

description: Contains context information corresponding with a specific context identifier.

type: object

properties:

contextId:

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

pendAnalytics:

type: array

items:

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

minItems: 1

description: Output analytics for the analytics subscription which have not yet been sent to the analytics consumer.

histAnalytics:

type: array

items:

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

minItems: 1

description: Historical output analytics.

lastOutputTime:

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

aggrSubs:

type: array

items:

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

minItems: 1

description: Information about analytics subscriptions that the NWDAF has with other NWDAFs to perform aggregation.

histData:

type: array

items:

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

minItems: 1

description: Historical data related to the analytics subscription.

adrfId:

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

adrfDataTypes:

type: array

items:

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

minItems: 1

description: Type(s) of data stored in the ADRF by the NWDAF.

aggrNwdafIds:

type: array

items:

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

minItems: 1

description: NWDAF identifiers of NWDAF instances used by the NWDAF service consumer when aggregating multiple analytics subscriptions.

modelProvIds:

type: array

items:

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

minItems: 1

description: Identifiers of NWDAFs that provide ML models used by the NF service consumer.

required:

- contextId

ContextIdList:

description: Contains a list of context identifiers of context information of analytics subscriptions.

type: object

properties:

contextIds:

type: array

items:

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

minItems: 1

required:

- contextIds

HistoricalData:

description: Contains historical data related to an analytics subscription.

type: object

properties:

startTime:

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

endTime:

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

subsWithSources:

type: array

items:

type: string

minItems: 1

description: Information about subscriptions with the data sources.

data:

type: array

items:

type: string

minItems: 1

description: Historical data related to the analytics.

required:

- data

SpecificAnalyticsSubscription:

description: Represents an existing subscription for a specific type of analytics to a specific NWDAF.

type: object

properties:

subscriptionId:

type: string

producerId:

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

producerSetId:

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

nwdafEvSub:

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

allOf:

- anyOf:

- required: [producerId]

- required: [producerSetId]

- required: [subscriptionId]

- required: [nwdafEvSub]

RequestedContext:

description: Contains types of analytics context information.

type: object

properties:

contexts:

type: array

items:

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

minItems: 1

description: List of analytics context types.

required:

- contexts

SmcceInfo:

description: Represents the Session Management congestion control experience information.

type: object

properties:

dnn:

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

snssai:

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

smcceUeList:

type: array

items:

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

minItems: 1

SmcceUeList:

description: Represents the List of UEs classified based on experience level of Session Management congestion control.

type: object

properties:

highLevel:

type: array

items:

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

mediumLevel:

type: array

items:

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

lowLevel:

type: array

items:

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

EventId:

anyOf:

- type: string

enum:

- LOAD\_LEVEL\_INFORMATION

- NETWORK\_PERFORMANCE

- NF\_LOAD

- SERVICE\_EXPERIENCE

- UE\_MOBILITY

- UE\_COMMUNICATION

- QOS\_SUSTAINABILITY

- ABNORMAL\_BEHAVIOUR

- USER\_DATA\_CONGESTION

- NSI\_LOAD\_LEVEL

- SM\_CONGESTION

- DISPERSION

- RED\_TRANS\_EXP

- WLAN\_PERFORMANCE

- DN\_PERFORMANCE

- 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

- LOAD\_LEVEL\_INFORMATION: Represent the analytics of load level information of corresponding network slice.

- NETWORK\_PERFORMANCE: Represent the analytics of network performance information.

- NF\_LOAD: Indicates that the event subscribed is NF Load.

- SERVICE\_EXPERIENCE: Represent the analytics of service experience information of the specific applications.

- UE\_MOBILITY: Represent the analytics of UE mobility.

- UE\_COMMUNICATION: Represent the analytics of UE communication.

- QOS\_SUSTAINABILITY: Represent the analytics of QoS sustainability information in the certain area.

- ABNORMAL\_BEHAVIOUR: Indicates that the event subscribed is abnormal behaviour information.

- USER\_DATA\_CONGESTION: Represent the analytics of the user data congestion in the certain area.

- NSI\_LOAD\_LEVEL: Represent the analytics of Network Slice and the optionally associated Network Slice Instance.

- SM\_CONGESTION: Represent the analytics of Session Management congestion control experience information for specific DNN and/or S-NSSAI.

- DISPERSION: Represents the analytics of dispersion.

- RED\_TRANS\_EXP: Represents the analytics of Redundant Transmission Experience.

- WLAN\_PERFORMANCE: Represents the analytics of WLAN performance.

- DN\_PERFORMANCE: Represents the analytics of DN performance.

ContextType:

anyOf:

- type: string

enum:

- PENDING\_ANALYTICS

- HISTORICAL\_ANALYTICS

- AGGR\_SUBS

- DATA

- AGGR\_INFO

- ML\_MODELS

- 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

- PENDING\_ANALYTICS: Represents context information that relates to pending output analytics.

- HISTORICAL\_ANALYTICS: Represents context information that relates to historical output analytics.

- AGGR\_SUBS: Represents context information about the analytics subscriptions that an NWDAF has with other NWDAFs that collectively serve an analytics subscription.

- DATA: Represents context information about historical data that is available.

- AGGR\_INFO: Represents context information that is related to aggregation of analytics from multiple NWDAF subscriptions.

- ML\_MODELS: Represents context information about used ML models.

AdrfDataType:

anyOf:

- type: string

enum:

- HISTORICAL\_ANALYTICS

- HISTORICAL\_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.

description: >

Possible values are

- HISTORICAL\_ANALYTICS: Indicates that historical analytics are stored in the ADRF.

- HISTORICAL\_DATA: Indicates that historical data are stored in the ADRF.

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

# A.5 Nnwdaf\_MLModelProvision API

openapi: 3.0.0

info:

title: Nnwdaf\_MLModelProvision

version: 1.0.0

description: |

Nnwdaf\_MLModelProvision API Service.

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externalDocs:

description: 3GPP TS 29.520 V17.7.0; 5G System; Network Data Analytics Services.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.520/

servers:

- url: '{apiRoot}/nnwdaf-mlmodelprovision/v1'

variables:

apiRoot:

default: https://example.com

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

security:

- {}

- oAuth2ClientCredentials:

- nnwdaf-mlmodelprovision

paths:

/subscriptions:

post:

summary: Create a new Individual NWDAF ML Model Provision Subscription resource.

operationId: CreateNWDAFMLModelProvisionSubcription

tags:

- Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: Create a new Individual NWDAF ML Model Provision Subscription resource.

content:

application/json:

schema:

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

headers:

Location:

description: 'Contains the URI of the newly created resource, according to the structure: {apiRoot}/nnwdaf-mlmodelprovision/v1/subscriptions/{subscriptionId}.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

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

'500':

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

'503':

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

default:

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

callbacks:

myNotification:

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

post:

requestBody:

required: true

content:

application/json:

schema:

type: array

items:

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

minItems: 1

responses:

'204':

description: No Content, Notification was succesfull

'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'

'503':

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

default:

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

/subscriptions/{subscriptionId}:

put:

summary: update an existing Individual NWDAF ML Model Provision Subscription

operationId: UpdateNWDAFMLModelProvisionSubcription

tags:

- Individual NWDAF ML Model Provision Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

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

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Nnwdaf\_MLModelProvision Service.

required: true

schema:

type: string

responses:

'200':

description: The Individual NWDAF ML Model Provision Subscription resource was modified successfully and a representation of that resource is returned.

content:

application/json:

schema:

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

'204':

description: The Individual NWDAF ML Model Provision Subscription resource was modified successfully.

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

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

'500':

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

'503':

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

default:

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

delete:

summary: Delete an existing Individual NWDAF ML Model Provision Subscription.

operationId: DeleteNWDAFMLModelProvisionSubcription

tags:

- Individual NWDAF ML Model Provision Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Nnwdaf\_MLModelProvision Service.

required: true

schema:

type: string

responses:

'204':

description: No Content. The Individual NWDAF ML Model Provision Subscription matching the subscriptionId was 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'

'503':

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

default:

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

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{nrfApiRoot}/oauth2/token'

scopes:

nnwdaf-mlmodelprovision: Access to the Nnwdaf\_MLModelProvision API

schemas:

NwdafMLModelProvSubsc:

description: Represents NWDAF Event Subscription resources.

type: object

properties:

mLEventSubscs:

type: array

items:

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

minItems: 1

description: Subscribed events

notifUri:

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

mLEventNotifs:

type: array

items:

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

minItems: 1

suppFeats:

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

notifCorreId:

type: string

eventReq:

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

failEventReports:

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

required:

- mLEventSubscs

- notifUri

MLEventSubscription:

description: Represents a subscription to a single event.

type: object

properties:

mLEvent:

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

mLEventFilter:

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

tgtUe:

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

mLTargetPeriod:

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

expiryTime:

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

required:

- mLEvent

- mLEventFilter

NwdafMLModelProvNotif:

description: Represents notifications on events that occurred.

type: object

properties:

eventNotifs:

type: array

items:

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

minItems: 1

description: Notifications about Individual Events.

subscriptionId:

type: string

description: String identifying a subscription to the Nnwdaf\_MLModelProvision Service.

required:

- eventNotifs

- subscriptionId

MLEventNotif:

description: Represents a notification related to a single event that occurred.

type: object

properties:

event:

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

notifCorreId:

type: string

mLFileAddr:

type: string

description: Indicates the address (e.g. a URL or an FQDN) of the ML model file.

adrfId:

type: string

description: Identifies the ADRF where the ML model is stored.

validityPeriod:

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

spatialValidity:

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

required:

- event

oneOf:

- required: [mLFileAddr]

- required: [adrfId]

FailureEventInfoForMLModel:

description: Represents the event(s) that the subscription is not successful including the failure reason(s).

type: object

properties:

event:

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

failureCode:

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

required:

- event

- failureCode

#

# ENUMERATIONS DATA TYPES

#

FailureCode:

anyOf:

- type: string

enum:

- UNAVAILABLE\_ML\_MODEL

- 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

- UNAVAILABLE\_ML\_MODEL: Indicates the requested ML model for the event is unavailable.

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