**3GPP TSG-CT WG3 Meeting #115e C3-212282**

**E-Meeting, 14th – 23rd April 2021 (Revision of C3-21xxxx)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.520** | **CR** | **0284** | **rev** | **-** | **Current version:** | **16.7.0** |  |
|  | | | | | | | | |
| *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:*** | Correction to Load Level Information | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GS\_Ph1-CT | | | | |  | ***Date:*** | | | 2021-04-06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories 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:*** | | Stage 2 specifications the network slice is identified by S-NSSAI, and the network slice instance is identified by NSI associated with the S-NSSAI.  While in this specification, the load level information of the network slice is described as the load level information of the network slice instance. And the loadLevelInformation attribute in Type SliceLoadLevelInformation, has not specify how to handle multiple S-NSSAI. Also missing the description of EventFilter type in clause 5.2.6.1, and several typos existing in the load level information related descriptions. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Correct network slice instance to be network slice for Load Level Information identified by S-NSSAI, adding description for the loadLevelInformation attribute in Type SliceLoadLevelInformation on multiple S-NSSAI, adding the missing description of EventFilter type in clause 5.2.6.1, and correct several typos in the load level information related descriptions. Also updates the corresponding descriptions in the OpenAPI files. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Wrong descriptions of network slice load level information, and not specify how to handle with multiple S-NSSAI, arousing wrong implementation and interworking problems. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.1.6.1, 5.1.6.2.3, 5.1.6.2.6, 5.1.6.3.2, 5.2.6.1, A.2, A.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 on OpenAPI files of Nnwdaf\_EventsSubscription API and Nnwdaf\_AnalyticsInfo API. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

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

#### 5.1.6.1 General

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

Table 5.1.6.1-1 specifies the data types defined for the Nnwdaf\_EventsSubscription service based interface protocol.

Table 5.1.6.1-1: Nnwdaf\_EventsSubscription specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| AdditionalMeasurement | 5.1.6.2.26 |  | AbnormalBehaviour |
| AddressList | 5.4.6.2.28 |  | AbnormalBehaviour |
| Accuracy | 5.1.6.3.5 | Represents the preferred level of accuracy of the analytics. |  |
| AnySlice | 5.1.6.3.2 | Represents the any slices. |  |
| BwRequirement | 5.1.6.2.25 | Represents bandwidth requirement. | ServiceExperience |
| CircumstanceDescription | 5.1.6.2.29 |  | AbnormalBehaviour |
| CongestionInfo | 5.1.6.2.18 |  | UserDataCongestion |
| CongestionType | 5.1.6.3.7 |  | UserDataCongestion |
| EventNotification | 5.1.6.2.5 | Describes Notifications about events that occurred. |  |
| EventReportingRequirement | 5.1.6.2.7 | Represents the type of reporting the subscription requires. |  |
| EventSubscription | 5.1.6.2.3 | Represents the subscription to a single event. |  |
| ExpectedAnalyticsType | 5.1.6.3.11 |  | AbnormalBehaviour |
| IpEthFlowDescription | 5.1.6.2.27 |  | AbnormalBehaviour |
| LoadLevelInformation | 5.1.6.3.2 | Represents load level information of the network slice. |  |
| LocationInfo | 5.1.6.2.11 |  | UeMobility |
| MatchingDirection | 5.1.6.3.12 | Defines the matching direction when crossing a threshold | NfLoad, QoSSustainability, UserDataCongestion, NetworkPerformance |
| NetworkPerfInfo | 5.1.6.2.23 |  | NetworkPerformance |
| NetworkPerfRequirement | 5.1.6.2.22 |  | NetworkPerformance |
| NetworkPerfType | 5.1.6.3.10 |  | NetworkPerformance |
| NfLoadLevelInformation | 5.1.6.2.31 | Represents load level information of a given NF instance. | NfLoad |
| NfStatus | 5.1.6.2.32 | Provides the percentage of time spent on various NF states | NfLoad |
| NwdafEvent | 5.1.6.3.4 | Describes the NWDAF Events. |  |
| NnwdafEventsSubscription | 5.1.6.2.2 | Represents an Individual NWDAF Event Subscription resource. |  |
| NnwdafEventsSubscriptionNotification | 5.1.6.2.4 | Represents an Individual NWDAF Event Subscription Notification resource. |  |
| NotificationMethod | 5.1.6.3.3 | Represents the notification methods that can be subscribed. |  |
| NsiIdInfo | 5.1.6.2.33 | Represents the S-NSSAI and the optionally associated Network Slice Instance Identifier(s). | ServiceExperience  NsiLoad |
| NsiLoadLevelInfo | 5.1.6.2.34 | Represents the load level information for an S-NSSAI and the optionally associated network slice instance. | NsiLoad |
| QosRequirement | 5.1.6.2.20 |  | QoSSustainability |
| QosSustainabilityInfo | 5.1.6.2.19 | Represents the QoS Sustainability information. | QoSSustainability |
| RetainabilityThreshold | 5.1.6.2.21 |  | QoSSustainability |
| ServiceExperienceInfo | 5.1.6.2.24 | Represents the service experience information. | ServiceExperience |
| SliceLoadLevelInformation | 5.1.6.2.6 | Represents the slices and their load level information. |  |
| TargetUeInformation | 5.1.6.2.8 | Identifies the target UE information. | ServiceExperience  NfLoad  NetworkPerformance  UserDataCongestion  UeMobility  UeCommunication  AbnormalBehaviour  QoSSustainability |
| ThresholdLevel | 5.1.6.2.30 | Describe a threshold level | UserDataCongestion  NfLoad |
| TimeUnit | 5.1.6.3.9 |  | QoSSustainability |
| TrafficCharacterization | 5.1.6.2.14 |  | UeCommunication |
| UeCommunication | 5.1.6.2.13 |  | UeCommunication |
| UeMobility | 5.1.6.2.10 |  | UeMobility |
| UserDataCongestionInfo | 5.1.6.2.17 | Represents the user data congestion information | UserDataCongestion |
| AbnormalBehaviour | 5.1.6.2.15 | Represents the abnormal behaviour information. | AbnormalBehaviour |
| Exception | 5.1.6.2.16 | Describes the Exception information. | AbnormalBehaviour |
| ExceptionId | 5.1.6.3.6 | Describes the Exception Id. | AbnormalBehaviour |
| ExceptionTrend | 5.1.6.3.7 | Describes the Exception Trend. | AbnormalBehaviour |

Table 5.1.6.1-2 specifies data types re-used by the Nnwdaf\_EventsSubscription service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nnwdaf service based interface.

Table 5.1.6.1-2: Nnwdaf\_EventsSubscription re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| 5Qi | 3GPP TS 29.571 [8] | Identifies the 5G QoS identifier | QoSSustainability |
| ApplicationId | 3GPP TS 29.571 [8] | Identifies the application identifier. | ServiceExperience  UeCommunication  AbnormalBehaviour |
| BitRate | 3GPP TS 29.571 [8] | String representing a bit rate that shall be formatted as follows:  pattern: "^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$"  Examples:  "125 Mbps", "0.125 Gbps", "125000 Kbps". | ServiceExperience  QoSSustainability |
| DateTime | 3GPP TS 29.571 [8] | Identifies the time. |  |
| Dnai | 3GPP TS 29.571 [8] | Identifies a user plane access to one or more DN(s). | ServiceExperience |
| Dnn | 3GPP TS 29.571 [8] | Identifies the DNN. | ServiceExperience  AbnormalBehaviour  UeCommunication |
| DurationSec | 3GPP TS 29.571 [8] |  |  |
| EthFlowDescription | 3GPP TS 29.514 [21] |  | UeCommunication  AbnormalBehaviour |
| ExpectedUeBehaviourData | 3GPP TS 29.503 [23] |  | AbnormalBehaviour |
| Float | 3GPP TS 29.571 [8] |  |  |
| FlowDescription | 3GPP TS 29.514 [21] |  | UeCommunication  AbnormalBehaviour |
| GroupId | 3GPP TS 29.571 [8] | Identifies a group of UEs. | UeMobility  UeCommunication NetworkPerformance  AbnormalBehaviour  ServiceExperience |
| Ipv4Addr | 3GPP TS 29.571 [8] |  |  |
| Ipv6Addr | 3GPP TS 29.571 [8] |  |  |
| NetworkAreaInfo | 3GPP TS 29.554 [18] | Identifies the network area. | ServiceExperience  QoSSustainability  AbnormalBehaviour  UeMobility  UserDataCongestion  NetworkPerformance |
| NfInstanceId | 3GPP TS 29.571 [8] | Identifies an NF instance | NfLoad |
| NfSetId | 3GPP TS 29.571 [8] | Identifies an NF Set instance | NfLoad |
| NFType | 3GPP TS 29.510 [12] | Indentifies a type of NF | NfLoad |
| NsiId | 3GPP TS 29.531 [24] | Identifies a Network Slice Instance | ServiceExperience  NsiLoad |
| PacketDelBudget | 3GPP TS 29.571 [8] |  | QoSSustainability |
| PacketErrRate | 3GPP TS 29.571 [8] |  | QoSSustainability |
| ProblemDetails | 3GPP TS 29.571 [8] | Used in error responses to provide more detailed information about an error. |  |
| QosResourceType | 3GPP TS 29.571 [8] | Identifies the resource type in QoS characteristics. | QoSSustainability |
| ReportingInformation | 3GPP TS 29.523 [20] | Represents the type of reporting the subscription requires. |  |
| SamplingRatio | 3GPP TS 29.571 [8] |  |  |
| ScheduledCommunicationTime | 3GPP TS 29.122 [19] |  | UeMobility UeCommunication |
| Snssai | 3GPP TS 29.571 [8] | Identifies the S-NSSAI (Single Network Slice Selection Assistance Information). |  |
| Supi | 3GPP TS 29.571 [8] | The SUPI for an UE. | ServiceExperience,  NfLoad  NetworkPerformance,  UserDataCongestion  UeMobility  UeCommunication  AbnormalBehaviour |
| SupportedFeatures | 3GPP TS 29.571 [8] | Used to negotiate the applicability of the optional features defined in table 5.1.8-1. |  |
| SvcExperience | 3GPP TS 29.517 [22] |  | ServiceExperience |
| TimeWindow | 3GPP TS 29.122 [19] |  |  |
| Uinteger | 3GPP TS 29.571 [8] | Unsigned Integer, i.e. only value 0 and integers above 0 are permissible. |  |
| Uri | 3GPP TS 29.571 [8] |  |  |
| UserLocation | 3GPP TS 29.571 [8] |  | UeMobility |
| Volume | 3GPP TS 29.122 [19] |  | UeCommunication  AbnormalBehaviour |

\*\*\* 2nd Change \*\*\*

##### 5.1.6.2.3 Type EventSubscription

Table 5.1.6.2.3-1: Definition of type EventSubscription

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| anySlice | AnySlice | C | 0..1 | Default is "FALSE". (NOTE 1) |  |
| appIds | array(ApplicationId) | C | 1..N | Identification(s) of application to which the subscription applies.  The absence of appIds means subscription to all applications. (NOTE 8) | ServiceExperience  UeCommunication  AbnormalBehaviour |
| dnns | array(Dnn) | C | 1..N | Identification(s) of DNN to which the subscription applies. Each DNN is a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.  The absence of dnns means subscription to all DNNs (NOTE 8) | ServiceExperience, AbnormalBehaviour  UeCommunication |
| dnais | array(Dnai) | C | 1..N | Identification(s) of user plane access to DN(s) which the subscription applies. | ServiceExperience |
| event | NwdafEvent | M | 1 | Event that is subscribed. |  |
| extraReportReq | EventReportingRequirement | O | 0..1 | The extra event reporting requirement information. |  |
| loadLevelThreshold | integer | C | 0..1 | 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. (NOTE 4)  May be included when subscribed event is "SLICE\_LOAD\_LEVEL". |  |
| matchingDir | MatchingDirection | O | 0..1 | A matching direction may be provided alongside a threshold. If omitted, the default value is CROSSED. | NfLoad, QoSSustainability, UserDataCongestion, NetworkPerformance |
| nfLoadLvlThds | array(ThresholdLevel) | C | 1..N | Shall be supplied in order to start reporting when an average load level is reached.(NOTE 4) | NfLoad |
| networkArea | NetworkAreaInfo | C | 0..1 | Identification of network area to which the subscription applies.  The absence of networkArea means subscription to all network areas. (NOTE 7), (NOTE 8) | ServiceExperience UeMobility  UeCommunication  QoSSustainability  AbnormalBehaviour  UserDataCongestion  NetworkPerformance |
| nfInstanceIds | array(NfInstanceId) | O | 1..N | Identification(s) of NF instances. | NfLoad |
| nfSetIds | array(NfSetId) | O | 1..N | Identification(s) of NF instance sets. | NfLoad |
| nfTypes | array(NFType) | O | 1..N | Identification(s) of NF types. | NfLoad |
| notificationMethod | NotificationMethod | O | 0..1 | Indicate the notification method. (NOTE 2) |  |
| nsiIdInfos | array(NsiIdInfo) | O | 1..N | Each element identifies the S-NSSAI and the optionally associated network slice instance(s).  May be included when subscribed event is "NSI\_LOAD\_LEVEL" or  "SERVICE\_EXPERIENCE".  (NOTE 1) | ServiceExperience  NsiLoad |
| nsiLevelThrds | array(Uinteger) | O | 1..N | Identifies the load threshold for each S-NSSAI or S-NSSAI and the optionally associated network slice instance identified by the "nsiIds" attribute within the "nsiIdInfos" attribute.  (NOTE 4) | NsiLoad |
| qosRequ | QosRequirement | C | 0..1 | Indicates the QoS requirements. It shall be included when subscribed event is "QOS\_SUSTAINABILITY". | QoSSustainability |
| qosFlowRetThds | array(RetainabilityThreshold) | C | 1..N | Represents the QoS flow retainability thresholds.Shall be supplied for the 5QI ("5qi" in "qosRequ") or resource type ("resType" in "qosRequ") of GBR resource type. (NOTE 4) | QoSSustainability |
| ranUeThrouThds | array(BitRate) | C | 1..N | Represents the RAN UE throughput thresholds.  Shall be supplied for the 5QI ("5qi" in "qosRequ") or resource type ("resType" in "qosRequ") of non-GBR resource type.(NOTE 4) | QoSSustainability |
| repetitionPeriod | DurationSec | C | 0..1 | Shall be supplied for notification Method "PERIODIC" by the "notificationMethod" attribute. |  |
| snssais | array(Snssai) | C | 1..N | Identification(s) of network slice to which the subscription applies. (NOTE 1), (NOTE 8) |  |
| tgtUe | TargetUeInformation | O | 0..1 | Identifies target UE information | (NOTE 3) |
| congThresholds | array(ThresholdLevel) | C | 1..N | Represents the congestion threshold levels. (NOTE 4) | UserDataCongestion |
| nwPerfRequs | array(NetworkPerfRequirement) | C | 1..N | Represents the network performance requirements. This attribute shall be included when subscribed eventis "NETWORK\_PERFORMANCE". | NetworkPerformance |
| bwRequs | array(BwRequirement) | O | 1..N | Represents the bandwidth requirement for each application. | ServiceExperience |
| excepRequs | array(Exception) | C | 1..N | Represents a list of Exception Ids with associated thresholds. May only be present when subscribed event is "ABNORMAL\_BEHAVIOUR".  (NOTE 5, NOTE 6) | AbnormalBehaviour |
| exptAnaType | ExpectedAnalyticsType | C | 0..1 | Represents expected UE analytics type.  It shall not be present if the "excepRequs" attribute is provided. (NOTE 6) | AbnormalBehaviour |
| exptUeBehav | ExpectedUeBehaviourData | O | 0..1 | Represents expected UE behaviour. | AbnormalBehaviour |
| NOTE 1: The "anySlice" attribute is not applicable to features "UeMobility" and "NetworkPerformance". The "snssais" attribute is not applicable to features "ServiceExperience", "NsiLoad", "UeMobility" and "NetworkPerformance". When subscribed event is "SLICE\_LOAD\_LEVEL", the identifications of network slices, either information about slice(s) identified by "snssais", or "anySlice" set to "TRUE" shall be included. When subscribed event is "QOS\_SUSTAINABILITY", "NF\_LOAD", "UE\_COMM", "ABNORMAL\_BEHAVIOUR" or "USER\_DATA\_CONGESTION", the identifications of network slices identified by "snssais" is optional. When subscribed event is "NSI\_LOAD\_LEVEL" or "SERVICE\_EXPERIENCE", either the "nsiIdInfos" attribute or "anySlice" set to "TRUE" shall be included.  NOTE 2: When notificationMethod is not supplied, the default value is "THRESHOLD".  NOTE 3: Applicability is further described in the corresponding data type.  NOTE 4: This property shall be provided if the "notifMethod" in "evtReq" is set to "ON\_EVENT\_DETECTION" or "notificationMethod" in "eventSubscriptions" is set to "THRESHOLD" or omitted.  NOTE 5: Only "excepId" and "excepLevel" within the Exception data type apply to the "excepRequs" attribute within EventSubscription data type.  NOTE 6: Either "excepRequs" or "exptAnaType" shall be provided if subscribed event is "ABNORMAL\_BEHAVIOUR".  NOTE 7: For "NETWORK\_PERFORMANCE", "SERVICE\_EXPERIENCE" or "USER\_DATA\_CONGESTION" event, this attribute shall be provided if the event applied for all UEs (i.e. "anyUe" attribute set to true within the "tgtUe" attribute). For "QOS\_SUSTAINABILITY", this attribute shall be provided.  NOTE 8: For "ABNORMAL\_BEHAVIOUR" event with "anyUe" attribute in "tgtUe" attribute sets to true,  - at least one of the "networkArea" and the "snssais" attribute should be included, if the expected analytics type via the"exptAnaType" attribute or the list of Exception Ids via the "excepRequs" attribute is mobility related;  - at least one of the "networkArea", "appIds", "dnns" and "snssais" attribute should be included, if the expected analytics type via the"exptAnaType" attribute or the list of Exception Ids via the "excepRequs" attribute is communication related;  - the expected analytics type via the"exptAnaType" attribute or the list of Exception Ids via "excepRequs" attribute shall not be requested for both mobility and communication related analytics at the same time. | | | | | |

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

##### 5.1.6.2.6 Type SliceLoadLevelInformation

Table 5.1.6.2.6-1: Definition of type SliceLoadLevelInformation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| loadLevelInformation | LoadLevelInformation | M | 1 | Load level information which applies for each network slice identified by snssais. |  |
| snssais | array(Snssai) | M | 1..N | Identification(s) of network slice to which the subscription applies. |  |

\*\*\* 4th Change \*\*\*

##### 5.1.6.3.2 Simple data types

The simple data types defined in table 5.1.6.3.2-1 shall be supported.

Table 5.1.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
| AnySlice | boolean | "FALSE" represents not applicable for all slices.  "TRUE" represents applicable for all slices. |  |
| LoadLevelInformation | integer | Load level information of the network slice . |  |

\*\*\* 5th Change \*\*\*

#### 5.2.6.1 General

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

Table 5.2.6.1-1 specifies the data types defined for the Nnwdaf\_AnalyticsInfo service based interface protocol.

Table 5.2.6.1-1: Nnwdaf\_AnalyticsInfo specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| AnalyticsData | 5.2.6.2.2 | Describes analytics with parameters indicated in the request |  |
| EventFilter | 5.2.6.2.3 | Represents the event filters used to identify the requested analytics.. |  |
| EventId | 5.2.6.3.3 | Describes the type of analytics. |  |

Table 5.2.6.1-2 specifies data types re-used by the Nnwdaf\_AnalyticsInfo service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nnwdaf service based interface.

Table 5.2.6.1-2: Nnwdaf\_AnalyticsInfo re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Accuracy | 5.1.6.3.5 | Represents the preferred level of accuracy of the analytics. |  |
| AnySlice | 5.1.6.3.2 |  |  |
| ApplicationId | 3GPP TS 29.571 [8] | Identifies the application. | ServiceExperience  UeCommunication  AbnormalBehaviour |
| BwRequirement | 5.1.6.2.25 |  | ServiceExperience |
| DateTime | 3GPP TS 29.571 [8] | Identifies the time. |  |
| Dnn | 3GPP TS 29.571 [8] | Identifies the DNN. | ServiceExperience  AbnormalBehaviour  UeCommunication |
| Dnai | 3GPP TS 29.571 [8] | Identifies a user plane access to one or more DN(s) | ServiceExperience |
| EventReportingRequirement | 5.1.6.2.7 |  |  |
| ExceptionId | 5.1.6.3.6 |  | AbnormalBehaviour |
| ExpectedUeBehaviourData | 3GPP TS 29.503 [23] |  | AbnormalBehaviour |
| ExpectedAnalyticsType | 5.1.6.3.11 |  | AbnormalBehaviour |
| GroupId | 3GPP TS 29.571 [8] | Internal Group Identifier of a group of UEs | UeMobility  UeCommunication  NetworkPerformance  AbnormalBehaviour  ServiceExperience |
| NetworkAreaInfo | 3GPP TS 29.554 [18] | The network area information. | UeMobility  NetworkPerformance  QoSSustainability  ServiceExperience  UserDataCongestion  AbnormalBehaviour |
| NetworkPerfInfo | 5.1.6.2.23 |  | NetworkPerformance |
| NetworkPerfType | 5.1.6.3.10 | Represents the network performance types. | NetworkPerformance |
| NfLoadLevelInformation | 5.1.6.2.31 | Represents load level information of a given NF instance. | NfLoad |
| NfInstanceId | 3GPP TS 29.571 [8] | Identifies an NF instance | NfLoad |
| NfSetId | 3GPP TS 29.571 [8] | Identifies an NF Set instance | NfLoad |
| NFType | 3GPP TS 29.510 [12] | Indentifies a type of NF | NfLoad |
| NsiId | 3GPP TS 29.531 [24] | Identifies a Network Slice Instance | ServiceExperience  NsiLoad |
| NsiIdInfo | 5.1.6.2.33 | Identify the S-NSSAI and the associated Network Slice Instance(s). | ServiceExperience  NsiLoad |
| NsiLoadLevelInfo | 5.1.6.2.34 | Represents the load level information for an S-NSSAI and the associated network slice instance. | NsiLoad |
| ProblemDetails | 3GPP TS 29.571 [8] | Used in error responses to provide more detailed information about an error. |  |
| QosRequirement | 5.1.6.2.20 |  | QoSSustainability |
| QosSustainabilityInfo | 5.1.6.2.19 |  | QoSSustainability |
| SamplingRatio | 3GPP TS 29.571 [8] |  |  |
| ServiceExperienceInfo | 5.1.6.2.24 |  | ServiceExperience |
| Supi | 3GPP TS 29.571 [8] | Identifies the UE. | ServiceExperience,  NfLoad  NetworkPerformance  UserDataCongestion  UeMobility  UeCommunication  AbnormalBehaviour |
| SupportedFeatures | 3GPP TS 29.571 [8] | Used to negotiate the applicability of the optional features defined in table 5.2.8-1. |  |
| Snssai | 3GPP TS 29.571 [8] |  |  |
| SliceLoadLevelInformation | 5.1.6.2.6 |  |  |
| TargetUeInformation | 5.1.6.2.8 | Identifies the target UE information. | ServiceExperience  NfLoad  NetworkPerformance  UserDataCongestion  UeMobility  UeCommunication  AbnormalBehaviour  QoSSustainability |
| UeCommunication | 5.1.6.2.13 |  | UeCommunication |
| UeMobility | 5.1.6.2.10 |  | UeMobility |
| Uinteger | 3GPP TS 29.571 [8] | Unsigned Integer, i.e. only value 0 and integers above 0 are permissible. |  |
| UserDataCongestionInfo | 5.1.6.2.17 |  | UserDataCongestion |
| AbnormalBehaviour | 5.1.6.2.15 | Represents the abnormal behaviour information. | AbnormalBehaviour |

\*\*\* 6th Change \*\*\*

# A.2 Nnwdaf\_EventsSubscription API

openapi: 3.0.0

info:

version: 1.1.3

title: Nnwdaf\_EventsSubscription

description: |

Nnwdaf\_EventsSubscription Service API.

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externalDocs:

description: 3GPP TS 29.520 V16.7.0; 5G System; Network Data Analytics Services.

url: 'http://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':

description: Temporary Redirect

content:

application/problem+json:

schema:

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

headers:

Location:

required: true

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

schema:

type: string

3gpp-Sbi-Target-Nf-Id:

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

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

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

headers:

Location:

required: true

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

schema:

type: string

3gpp-Sbi-Target-Nf-Id:

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

schema:

type: string

'400':

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

'401':

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

'403':

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

'404':

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

'411':

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

'413':

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

'415':

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

'429':

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

'500':

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

'503':

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

default:

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

/subscriptions/{subscriptionId}:

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':

description: Temporary Redirect

content:

application/problem+json:

schema:

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

headers:

Location:

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

required: true

schema:

type: string

3gpp-Sbi-Target-Nf-Id:

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

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

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

headers:

Location:

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

required: true

schema:

type: string

3gpp-Sbi-Target-Nf-Id:

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

schema:

type: string

'400':

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

'401':

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

'403':

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

'404':

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':

description: Temporary Redirect

content:

application/problem+json:

schema:

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

headers:

Location:

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

required: true

schema:

type: string

3gpp-Sbi-Target-Nf-Id:

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

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

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

headers:

Location:

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

required: true

schema:

type: string

3gpp-Sbi-Target-Nf-Id:

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

schema:

type: string

'400':

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

'401':

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

'403':

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

'404':

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'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{nrfApiRoot}/oauth2/token'

scopes:

nnwdaf-eventssubscription: Access to the Nnwdaf\_EventsSubscription API

schemas:

NnwdafEventsSubscription:

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

required:

- eventSubscriptions

EventSubscription:

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'

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'

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. When subscribed event is "SLICE\_LOAD\_LEVEL", either information about slice(s) identified by snssai, or anySlice set to "TRUE" shall be included. It corresponds to snssais in the data model definition of 3GPP TS 29.520. When subscribed is “QOS\_SUSTAINABILITY”, the identifications of network slices is optional.

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'

required:

- event

NnwdafEventsSubscriptionNotification:

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:

type: object

properties:

event:

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

expiry:

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

timeStampGen:

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

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

required:

- event

ServiceExperienceInfo:

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'

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'

required:

- svcExprc

BwRequirement:

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:

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.

required:

- loadLevelInformation

- snssais

NsiLoadLevelInfo:

description: Represents the 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'

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:

type: object

properties:

accuracy:

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

startTs:

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

endTs:

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

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'

TargetUeInformation:

type: object

properties:

anyUe:

type: boolean

supis:

type: array

items:

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

intGroupIds:

type: array

items:

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

UeMobility:

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:

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:

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'

confidence:

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

required:

- commDur

- trafChar

TrafficCharacterization:

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:

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:

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'

required:

- congType

- timeIntev

- nsi

QosSustainabilityInfo:

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:

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:

type: object

properties:

congLevel:

type: integer

nfLoadLevel:

type: integer

nfCpuUsage:

type: integer

nfMemoryUsage:

type: integer

nfStorageUsage:

type: integer

NfLoadLevelInformation:

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

snssai:

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

confidence:

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

required:

- nfType

- nfInstanceId

NfStatus:

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.

AbnormalBehaviour:

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:

type: object

properties:

excepId:

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

excepLevel:

type: integer

excepTrend:

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

required:

- excepId

AdditionalMeasurement:

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:

type: object

properties:

ipTrafficFilter:

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

ethTrafficFilter:

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

AddressList:

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:

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:

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:

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:

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:

type: object

properties:

event:

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

failureCode:

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

required:

- event

- failureCode

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. The threshold of the notification is identified by loadLevelThreshold defined in subclause 5.1.6.2.3.

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

- 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

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.

- SESS\_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

- 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.

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

\*\*\* 7th Change \*\*\*

# A.3 Nnwdaf\_AnalyticsInfo API

openapi: 3.0.0

info:

version: 1.1.1

title: Nnwdaf\_AnalyticsInfo

description: |

Nnwdaf\_AnalyticsInfo Service API.

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externalDocs:

description: 3GPP TS 29.520 V16.5.0; 5G System; Network Data Analytics Services.

url: 'http://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':

$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:

type: object

properties:

expiry:

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

timeStampGen:

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

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

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

networkArea:

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

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'

not:

required: [anySlice, snssais]

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

- 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.

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