**3GPP TSG-CT WG3 Meeting #128 C3-232257**

**Bratislava, Slovakia, 22nd - 26th May, 2023 (Revision of C3-23xxxx)**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.520** | **CR** | **0728** | **rev** |  | **Current version:** | **18.1.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
|  |

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

|  |
| --- |
|  |
| ***Title:***  | Updates for UE mobility analytics using fine granularity |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | eNA\_Ph3 |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | The agreed TS 23.288 CR 0703 (S2-2306105) enhance UE mobility analytics with fine granularity in clause 6.7.2 in TS 23.288, needs to be implemented in this specification accordingly. |
|  |  |
| ***Summary of change:*** | Updates to support UE Mobility analytics with fine granularity. |
|  |  |
| ***Consequences if not approved:*** | Not aligned with stage 2, not support the enhancement of UE Mobility analytics with fine granularity. |
|  |  |
| ***Clauses affected:*** | 5.1.6.1, 5.1.6.2.11, 5.1.6.2.71, 5.1.6.3.32 (new), 5.1.8, 5.2.6.2.2, A.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 23.288 CR 0703 |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR introduces backward compatible feature into OpenAPI file for Nnwdaf\_EventsSubscription API. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

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

#### 5.1.6.1 General

This clause 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 |
| AbnormalBehaviour | 5.1.6.2.15 | Represents the abnormal behaviour information. | AbnormalBehaviour |
| Accuracy | 5.1.6.3.5 | Represents the preferred level of accuracy of the analytics. |  |
| AdditionalMeasurement | 5.1.6.2.26 | Represents additional measurement information. | AbnormalBehaviour |
| AddressList | 5.1.6.2.28 | Represents a list of IPv4 and/or IPv6 addresses. | AbnormalBehaviour |
| AnalyticsContextIdentifier | 5.1.6.2.43 | Contains information about available analytics contexts. | AnaSubTransfer |
| AnalyticsMetadata | 5.1.6.3.14 | Represents the types of analytics metadata information that can be requested. | Aggregation |
| AnalyticsMetadataIndication | 5.1.6.2.36 | Contains analytics metadata values indicated to be used during analytics generation. | Aggregation |
| AnalyticsMetadataInfo | 5.1.6.2.37 | Contains analytics metadata information required for analytics aggregation. | Aggregation |
| AnalyticsSubscriptionsTransfer | 5.1.6.2.40 | Contains information about a request to transfer analytics subscriptions. | AnaSubTransfer |
| AnalyticsSubset | 5.1.6.3.18 | Analytics subset used to indicate the content of the analytics. | EneNA |
| AnySlice | 5.1.6.3.2 | Represents the any slices. |  |
| ApplicationVolume | 5.1.6.2.55 | Application data volume per application Id. | Dispersion |
| AppListForUeComm | 5.1.6.2.64 | Represents the analytics of the application list used by UE. | UeCommunicationExt |
| BwRequirement | 5.1.6.2.25 | Represents bandwidth requirement. | ServiceExperience |
| ClassCriterion | 5.1.6.2.51 | Disperion class criterion. | Dispersion |
| CircumstanceDescription | 5.1.6.2.29 | Contains the description of a circumstance. | AbnormalBehaviour |
| CongestionInfo | 5.1.6.2.18 | Represents the congestion information | UserDataCongestion |
| CongestionType | 5.1.6.3.8 | Identification congestion analytics type. | UserDataCongestion |
| ConsumerNfInformation | 5.1.6.2.49 | Represents the analytics consumer NF Information. | AnaSubTransfer |
| DatasetStatisticalProperty | 5.1.6.3.15 | Dataset statistical properties of the data used to generate the analytics. | Aggregation |
| DeviceType | 5.1.6.3.31 | The type of device. | QoSSustainabilityExt\_eNA |
| DnPerf | 5.1.6.2.46 | Represents DN performance information. | DnPerformance |
| DnPerfInfo | 5.1.6.2.45 | Represents DN performances for the application. | DnPerformance |
| DnPerfOrderingCriterion | 5.1.6.3.25 | Ordering criterion for the list of DN performance analytics. | DnPerformance |
| DnPerformanceReq | 5.1.6.2.66 | Represents DN performance analytics requirement. | DnPerformance |
| DispersionClass | 5.1.6.3.20 | Dispersion class. | Dispersion |
| DispersionCollection | 5.1.6.2.54 | Dispersion collections per UE location or or per slice. | Dispersion |
| DispersionInfo | 5.1.6.2.53 | Dispersion analytics information. | Dispersion |
| DispersionRequirement | 5.1.6.2.50 | Dispersion analytics requirement. | Dispersion |
| DispersionType | 5.1.6.3.19 | Dispersion type. | Dispersion |
| DispersionOrderingCriterion | 5.1.6.3.21 | Ordering criterion for the list of Dispersion. | Dispersion |
| 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. |  |
| 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 |
| ExpectedAnalyticsType | 5.1.6.3.11 | Represents expected UE analytics type. | AbnormalBehaviour |
| FailureEventInfo | 5.1.6.2.35 | Contains information on the event for which the subscription is not successful. |  |
| IpEthFlowDescription | 5.1.6.2.27 | Contains the description of an Uplink and/or Downlink Ethernet flow. | AbnormalBehaviour |
| LoadLevelInformation | 5.1.6.3.2 | Represents load level information of the network slice and the optionally associated network slice instance. |  |
| LocationGranularity | 5.1.6.3.32 | Indicates the location granularity | UeMobilityExt2\_eNA |
| LocationInfo | 5.1.6.2.11 | Represents UE location information. | UeMobility |
| MatchingDirection | 5.1.6.3.12 | Defines the matching direction when crossing a threshold. | NfLoad, QoSSustainability, UserDataCongestion, NetworkPerformanceDispersionRedundantTransmissionExpWlanPerformanceServiceExperienceExtNsiLoadExt |
| MLModelInfo | 5.1.6.2.69 | The information of the ML model. | AnaSubTransfer |
| ModelInfo | 5.1.6.2.42 | Contains information about an ML model. | AnaSubTransfer |
| NetworkPerfInfo | 5.1.6.2.23 | Represents the network performance information. | NetworkPerformance |
| NetworkPerfOrderCriterion | 5.1.6.3.30 | The ordering criterion for the list of network performance analytics. | EnNetworkPerformance |
| NetworkPerfRequirement | 5.1.6.2.22 | Represents a network performance requirement. | 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 |
| NfStatus | 5.1.6.2.32 | Provides the percentage of time spent on various NF states. | NfLoad |
| 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. |  |
| NumberAverage | 5.1.6.2.38 | Represents average and variance information. | NsiLoadExt |
| NwdafEvent | 5.1.6.3.4 | Describes the NWDAF Events. |  |
| NwdafFailureCode | 5.1.6.3.13 | Identifies the failure reason. |  |
| 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). | ServiceExperienceNsiLoadDnPerformance |
| NsiLoadLevelInfo | 5.1.6.2.34 | Represents the load level information for an S-NSSAI and the optionally associated network slice instance. | NsiLoad  |
| ObservedRedundantTransExp | 5.1.6.2.70 | Represents the observed Redundant Transmission Experience. | RedundantTransmissionExp |
| OutputStrategy | 5.1.6.3.16 | Represents the output strategy used for the reporting of the analytics. | Aggregation |
| PerfData | 5.1.6.2.47 | Represents DN performance information. | DnPerformance |
| PrevSubInfo | 5.1.6.2.68 | Information of the previous subscription. | AnaCtxTransfer |
| QosRequirement | 5.1.6.2.20 | Represents the QoS requirements. | QoSSustainability |
| QosSustainabilityInfo | 5.1.6.2.19 | Represents the QoS Sustainability information. | QoSSustainability |
| RankingCriterion | 5.1.6.2.52 | Ranking criterion. | Dispersion |
| RatFreqInformation | 5.1.6.2.67 | Represents the RAT type and/or Frequency information. | ServiceExperienceExt |
| RedTransExpOrderingCriterion | 5.1.6.3.22 | Ordering criterion for the list of Redundant Transmission Experience. | RedundantTransmissionExp |
| RedundantTransmissionExpInfo | 5.1.6.2.57 | Redundant transmission experience analytics information. | RedundantTransmissionExp |
| RedundantTransmissionExpPerTS | 5.1.6.2.58 | Redundant Transmission Experience per Time Slot. | RedundantTransmissionExp |
| RedundantTransmissionExpReq | 5.1.6.2.56 | Redundant transmission experience analytics requirement. | RedundantTransmissionExp |
| ResourceUsage | 5.1.6.2.48 | The current usage of the virtual resources assigned to the NF instances belonging to a particular network slice instance. | NsiLoadExt |
| RetainabilityThreshold | 5.1.6.2.21 | Represents a QoS flow retainability threshold. | QoSSustainability |
| ServiceExperienceInfo | 5.1.6.2.24 | Represents the service experience information. | ServiceExperience |
| ServiceExperienceType | 5.1.6.3.24 | Represents the type of Service Experience Analytics. | ServiceExperienceExt |
| SessInactTimerForUeComm | 5.1.6.2.65 | Represents the N4 Session inactivity timer. | UeCommunicationExt |
| SliceLoadLevelInformation | 5.1.6.2.6 | Represents the slices and their load level information. |  |
| SubscriptionTransferInfo | 5.1.6.2.41 | Contains information about subscriptions that are requested to be transferred. | AnaSubTransfer |
| TargetUeInformation | 5.1.6.2.8 | Identifies the target UE information. | ServiceExperienceNfLoadNetworkPerformanceUserDataCongestionUeMobilityUeCommunicationAbnormalBehaviourQoSSustainabilityDispersionRedundantTransmissionExpWlanPerformanceDnPerformance |
| TermCause | 5.1.6.3.26 | Represents a cause for requesting to terminate an analytics subscription. | TermRequest |
| ThresholdLevel | 5.1.6.2.30 | Describe a threshold level. | UserDataCongestionNfLoadDnPerformanceServiceExperienceExt |
| TimeUnit | 5.1.6.3.9 | Represents the unit for the session active time. | QoSSustainability |
| TopApplication | 5.1.6.2.39 | Top application that contributes the most to the traffic. | UserDataCongestionExt |
| TrafficCharacterization | 5.1.6.2.14 | Identifies the detailed traffic characterization. | UeCommunication |
| TrafficInformation | 5.1.6.2.63 | Traffic information including UL/DL data rate and/or Traffic volume. | WlanPerformance |
| TransferRequestType | 5.1.6.3.17 | Represents the type of a request for analytics subscription transfer. | AnaSubTransfer |
| UeAnalyticsContextDescriptor | 5.1.6.2.44 | Contains information about available UE related analytics contexts. | AnaSubTransfer |
| UeCommunication | 5.1.6.2.13 | Represents UE communication information. | UeCommunication |
| UeCommOrderCriterion | 5.1.6.3.29 | The ordering criterion for the list of UE communication analytics. | EnUeCommunication |
| UeCommReq | 5.1.6.2.72 | UE communication analytics requirement. | EnUeCommunication |
| UeMobilityOrderCriterion | 5.1.6.3.28 | The ordering criterion for the list of UE mobility analytics. | UeMobilityExt2\_eNA |
| UeMobilityReq | 5.1.6.2.71 | UE mobility analytics requirement. | UeMobilityExt2\_eNA |
| UeMobility | 5.1.6.2.10 | Represents UE mobility information. | UeMobility |
| UserDataConOrderCrit | 5.1.6.3.27 | The ordering criterion for the list of User Data Congestion analytics. | UserDataCongestionExt2\_eNA |
| UserDataCongestionInfo | 5.1.6.2.17 | Represents the user data congestion information. | UserDataCongestion |
| WlanOrderingCriterion | 5.1.6.3.23 | Ordering criterion for the list of WLAN performance information. | WlanPerformance |
| WlanPerformanceReq | 5.1.6.2.59 | WLAN performance analytics requirement. | WlanPerformance |
| WlanPerformanceInfo | 5.1.6.2.60 | WLAN performance analytics information. | WlanPerformance |
| WlanPerSsIdPerformanceInfo | 5.1.6.2.61 | WLAN performance information per SSID of WLAN access points deployed in the Area of Interest. | WlanPerformance |
| WlanPerTsPerformanceInfo | 5.1.6.2.62 | WLAN performance information per Time Slot during the analytics target period. | WlanPerformance |

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 |
| AddrFqdn | 3GPP TS 29.517 [22] | Represents the IP address or FQDN of the Application Server. | DnPerformanceServiceExperienceExt |
| ApplicationId | 3GPP TS 29.571 [8] | Identifies the application identifier. | ServiceExperience UeCommunicationAbnormalBehaviourDispersionDnPerformance |
| ArfcnValueNR | 3GPP TS 29.571 [8] | Integer value indicating the ARFCN applicable for a downlink, uplink or bi-directional (TDD) NR global frequency raster.Minimum = 0. Maximum = 3279165. | ServiceExperienceExt |
| 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". | ServiceExperienceQoSSustainabilityWlanPerformanceDnPerformance |
| 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). | ServiceExperienceDnPerformance |
| Dnn | 3GPP TS 29.571 [8] | Identifies the DNN. | ServiceExperienceAbnormalBehaviourUeCommunicationDnPerformanceSMCCE |
| DurationSec | 3GPP TS 29.571 [8] |  |  |
| EthFlowDescription | 3GPP TS 29.514 [21] |  | UeCommunicationAbnormalBehaviour |
| ExpectedUeBehaviourData | 3GPP TS 29.503 [23] |  | AbnormalBehaviour |
| Float | 3GPP TS 29.571 [8] |  |  |
| FlowDescription | 3GPP TS 29.514 [21] |  | UeCommunicationAbnormalBehaviour |
| FlowInfo | 3GPP TS 29.122 [19] |  | UserDataCongestionExt |
| GeographicalCoordinates | 3GPP TS 29.572 [30] | Identifies the geographical location (longitude and latitude level). | UeMobilityExt2\_eNA |
| Gpsi | 3GPP TS 29.571 [8] | The GPSI for an UE. | UserDataCongestionExt |
| GroupId | 3GPP TS 29.571 [8] | Identifies a group of UEs. | UeMobilityUeCommunication NetworkPerformance AbnormalBehaviourServiceExperienceDispersionRedundantTransmissionExpWlanPerformance |
| Ipv4Addr | 3GPP TS 29.571 [8] |  |  |
| Ipv6Addr | 3GPP TS 29.571 [8] |  |  |
| NetworkAreaInfo | 3GPP TS 29.554 [18] | Identifies the network area. | ServiceExperienceQoSSustainabilityAbnormalBehaviourUeMobilityUserDataCongestionNetworkPerformance NsiLoadExtNfLoadExtDispersionRedundantTransmissionExpWlanPerformanceUeCommunicationDnPerformance |
| 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. | ServiceExperienceNsiLoadDnPerformance |
| PacketDelBudget | 3GPP TS 29.571 [8] |  | QoSSustainabilityDnPerformance |
| PacketErrRate | 3GPP TS 29.571 [8] |  | QoSSustainability |
| PacketLossRate | 3GPP TS 29.517 [22] | Indicates Packet Loss Rate. | DnPerformance |
| PduSessionId | 3GPP TS 29.571 [8] | Indentifies PDU Session |  |
| 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 |
| RatType | 3GPP TS 29.571 [8] | Identifies the RAT type. | ServiceExperienceExt |
| RedirectResponse | 3GPP TS 29.571 [8] | Contains redirection related information. | ES3XX |
| 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 |
| SmcceInfo | 5.2.6.2.12 | Represents the analytics of Session Management Congestion Control Experience information. | SMCCE |
| 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,NfLoadNetworkPerformance,UserDataCongestionUeMobilityUeCommunicationAbnormalBehaviourDispersionRedundantTransmissionExpWlanPerformance |
| 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 |
| Tai | 3GPP TS 29.571 [8] | Tracking Area Information. | AnaSubTransfer |
| 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. |  |
| UpfInformation | 3GPP TS 29.508 [29] | The information of the UPF serving the UE. | ServiceExperienceExtDnPerformance |
| Uri | 3GPP TS 29.571 [8] |  |  |
| UserLocation | 3GPP TS 29.571 [8] |  | UeMobility Dispersion |
| VelocityEstimate | 3GPP TS 29.572 [30] | Velocity estimate | QoSSustainabilityExt\_eNA |
| Volume | 3GPP TS 29.122 [19] |  | UeCommunicationAbnormalBehaviourDispersionWlanPerformance |

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

##### 5.1.6.2.11 Type LocationInfo

Table 5.1.6.2.11-1: Definition of type LocationInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| loc | UserLocation | M | 1 | This attribute contains the detailed location, the ueLocationTimestamp attribute in the 3GPP access type of UserLocation data type shall not be provided. |  |
| geoLoc | GeographicalCoordinates | C | 0..1 | This attribute contains the geographical location (longitude and latitude level).Shall be provided when the "locationGranReq" attribute value "LON\_AND\_LAT\_LEVEL" is subscribed or requested.(NOTE 2) | UeMobilityExt2\_eNA |
| ratio | SamplingRatio | C | 0..1 | This attribute contains the percentage of UEs with same analytics result in the group.Shall be present if the analytics result applies for a group of UEs. |  |
| confidence | Uinteger | C | 0..1 | Indicates the confidence of the prediction. (NOTE 1)Shall be present if the analytics result is a prediction.Minimum = 0. Maximum = 100. |  |
| NOTE 1: If the requested period identified by the "startTs" and "endTs" attributes in the "EventReportingRequirement" type is a future time period, which means the analytics result is a prediction. If no sufficient data is collected to provide the confidence of the prediction before the time deadline, the NWDAF shall return a zero confidence.NOTE 2: When possible and applicable to the access type, UE location is provided according to the preferred granularity subscribed or requested in the "locationGranReq” attribute. |

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

##### 5.1.6.2.71 Type UeMobilityReq

Table 5.1.6.2.71-1: Definition of type UeMobilityReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| orderCriterion | UeMobilityOrderCriterion | O | 0..1 | The ordering criterion for the list of UE mobility analytics. |  |
| orderDirection | MatchingDirection | O | 0..1 | Indicate the order: ascending or descending time slot start. May be present when the "orderCriterion" attribute is included. (NOTE) |  |
| locationGranReq | LocationGranularity | O | 0..1 | Indicates the preferred granularity of location information requirement. | UeMobilityExt2\_eNA |
| NOTE: The "CROSSED" value in "MatchingDirection" date type is not applicable for this attribute. |

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

##### 5.1.6.3.32 Enumeration: LocationGranularity

Table 5.1.6.3.32-1: Enumeration LocationGranularity

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| TA\_LEVEL | Indicates location granularity of TA level. |  |
| CELL\_LEVEL | Indicates location granularity of cell level. |  |
| LON\_AND\_LAT\_LEVEL | Indicates location granularity of longitude and latitude level. |  |

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

### 5.1.8 Feature negotiation

The optional features in table 5.1.8-1 are defined for the Nnwdaf\_EventsSubscription API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [6].

Table 5.1.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | ServiceExperience | This feature indicates support for the event related to service experience. |
| 2 | UeMobility | This feature indicates the support of analytics based on UE mobility information. |
| 3 | UeCommunication | This feature indicates the support of analytics based on UE communication information. |
| 4 | QoSSustainability | This feature indicates support for the event related to QoS sustainability. |
| 5 | AbnormalBehaviour | This feature indicates support for the event related to abnormal behaviour information. |
| 6 | UserDataCongestion | This feature indicates support for the event related to user data congestion. |
| 7 | NfLoad | This feature indicates the support of the analytics related to the load of NF instances. |
| 8 | NetworkPerformance | This feature indicates the support of analytics based on network performance. |
| 9 | NsiLoad | This feature indicates the support of the event related to the load level of Network Slice and the optionally associated Network Slice Instance. |
| 10 | ES3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation, according to Stateless NF procedures as specified in clauses 6.5.3.2 and 6.5.3.3 of 3GPP TS 29.500 [6] and according to HTTP redirection principles for indirect communication, as specified in clause 6.10.9 of 3GPP TS 29.500 [6].  |
| 11 | EneNA | This feature indicates support for the enhancements of network data analytics requirements. |
| 12 | UserDataCongestionExt | This feature indicates support for the extensions to the event related to user data congestion, including support of GPSI and/or list of Top applications. Supporting this feature also requires the support of feature UserDataCongestion. |
| 13 | Aggregation | This feature indicates support for analytics aggregation. |
| 14 | NsiLoadExt | This feature indicates support for the extensions to the event related to the load level of Network Slice and the optionally associated Network Slice Instance, including support of area of interest, NF load information and number of UE or number of PDU Session. Supporting this feature also requires the support of feature NsiLoad. |
| 15 | ServiceExperienceExt | This feature indicates support for the extensions to the event related to service experience, including support of RAT type and/or Frequency. Supporting this feature also requires the support of feature ServiceExperience. |
| 16 | DnPerformance | This feature indicates the support of the analytics related to DN performance. |
| 17 | NfLoadExt | This feature indicates support for the extensions to the event related to the load of NF instances, including NF load over area of interest. Supporting this feature also requires the support of feature NfLoad. |
| 18 | Dispersion | This feature indicates support of the analytics related to dispersion analytics information. |
| 19 | RedundantTransmissionExp | This feature indicates support of the analytics related to redundant transmission experience analytics information. |
| 20 | WlanPerformance | This feature indicates support of the analytics related to WLAN performance information. |
| 21 | UeCommunicationExt | This feature indicates the support of the analytics related to UE communication. |
| 22 | UeMobilityExt | This feature indicates support for extensions to the event related to UE mobility, including support of LADN DNN to refer the LADN service area as the AOI. Supporting this feature also requires the support of feature UeMobility. |
| 23 | AnaCtxTransfer | This feature indicates support for functionality related to Analytics Context Transfer. |
| 24 | AnaSubTransfer | This feature indicates support for Analytics Subscription Transfer initiated by the source NWDAF. |
| 25 | UserConsent | Indicates the support of detailed handling of user consent, e.g. error responses related to the lack of user consent. |
| 26 | TermRequest | This feature indicates support for Analytics Subscription termination requests sent by the NWDAF to the NF service consumer. |
| 27 | ENAExt | This feature indicates support for the general enhancements of network data analytics requirements. |
| 28 | EnAbnormalBehaviour | This feature indicates support for the enhancements of UE Abnormal Behaviour. |
| 29 | EnQoSSustainability | This feature indicates support for the enhancements of QoS Sustainability. |
| 30 | UserDataCongestionExt2\_eNA | This feature indicates support for the enhancements of user data congestion, including support of ordering criterion. Supporting this feature also requires the support of UserDataCongestion and UserDataCongestionExt features. |
| 31 | UeMobilityExt2\_eNA | This feature indicates support for the enhancements of UE mobility, including support of ordering criterion and fine location granularity. Supporting this feature also requires the support of UeMobility and UeMobilityExt features. |
| 32 | EnUeCommunication | This feature indicates support for the enhancements of UE Communication. |
| 33 | EnNetworkPerformance | This feature indicates support for the enhancements of Network Performance |
| 34 | QoSSustainabilityExt\_eNA | This feature indicates support for the enhancements of QoS Sustainability, including enhancements of filter information. Supporting this feature also requires the support of QoSSustainability feature. |
| 35 | PartialAnalyticsSubTransfer | This feature indicates support for partial successful analytics subscription transfer. |
| 36 | NetworkPerformanceExt\_eNA | This feature indicates the support for extensions to the analytics event related to network performance, including support of analytics target period subset. |

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

##### 5.2.6.2.2 Type AnalyticsData

Table 5.2.6.2.2-1: Definition of type AnalyticsData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| start | DateTime | O | 0..1 | It defines the start time of which the analytics information will become valid. (NOTE 1) |  |
| expiry | DateTime | O | 0..1 | It defines the expiration time after which the analytics information will become invalid. (NOTE 1) |  |
| timeStampGen | DateTime | C | 0..1 | It defines the timestamp of analytics generation. (NOTE 3) |  |
| anaMetaInfo | AnalyticsMetadataInfo | C | 0..1 | Contains information about analytics metadata required to aggregate the analytics. It shall be present if the "anaMeta" attribute was included in the request, containing the information indicated by the "anaMeta" attribute. | Aggregation |
| sliceLoadLevelInfos | array(SliceLoadLevelInformation) | C | 1..N | The slices and the load level information. Shall be present when the requested event is "LOAD\_LEVEL\_INFORMATION". |  |
| nsiLoadLevelInfos | array(NsiLoadLevelInfo) | C | 1..N | Each element identifies the load level information for an S-NSSAI and the optionally associated network slice instance.Shall be presented when the requested event is "NSI\_LOAD\_LEVEL"  | NsiLoad  |
| nwPerfs | array(NetworkPerfInfo) | C | 1..N | The network performance information.Shall be present when the requested event is "NETWORK\_PERFORMANCE". | NetworkPerformance |
| nfLoadLevelInfos | array(NfLoadLevelInformation) | C | 1..N | The NF load information.When the requestedevent is "NF\_LOAD", the nfLoadLevelInfos shall be included. | NfLoad |
| qosSustainInfos | array(QosSustainabilityInfo) | C | 1..N | The QoS sustainability informations in the certain geographic areas. It shall be present if the requested eventis "QOS\_SUSTAINABILITY".(NOTE 2) | QoSSustainability |
| ueMobs | array(UeMobility) | C | 1..N | The UE mobility information.When the requested event is "UE\_MOBILITY", the "ueMobs" attribute shall be included.(NOTE 4) | UeMobility |
| ueComms | array(UeCommunication) | C | 1..N | The UE communication information.When the requested event is "UE\_COMM", the "ueComms" attribute shall be included. | UeCommunication |
| userDataCongInfos | array(UserDataCongestionInfo) | C | 1..N | The user data congestion information.Shall be present when the requested event is "USER\_DATA\_CONGESTION". | UserDataCongestion |
| suppFeat | SupportedFeatures | C | 0..1 | List of Supported features used as described in clause 5.2.8.This parameter shall be supplied by NWDAF in the reply of GET request that request the analytics resource, if the consumer includes "supported-features" in the GET request. |  |
| svcExps | array(ServiceExperienceInfo) | C | 1..N | The service experience information. Shall be present when the requested event is "SERVICE\_EXPERIENCE". | ServiceExperience |
| abnorBehavrs | array(AbnormalBehaviour) | C | 1..N | The abnormal behaviour information. Shall be present when the requested event is "ABNORMAL\_BEHAVIOUR". | AbnormalBehaviour |
| smccExps | array(SmcceInfo) | C | 1..N | The Session Management congestion control experience information.Shall be present when the requested event is "SM\_CONGESTION". | SMCCE |
| disperInfos | array(DispersionInfo) | C | 1..N | The Dispersion information.Shall be present when the requested event is "DISPERSION". | Dispersion |
| redTransInfos | array(RedundantTransmissionExpInfo) | C | 1..N | The Redundant Transmission Experience analytics information.Shall be present when the requested event is "RED\_TRANS\_EXP". | RedundantTransmissionExp |
| wlanInfos | array(WlanPerformanceInfo) | C | 1..N | The WLAN performance related information.When requested event is "WLAN\_PERFORMANCE", the "wlanInfos" attribute shall be included. | WlanPerformance |
| dnPerfInfos | array(DnPerfInfo) | C | 1..N | The DN performance information.Shall be present when the requested event is "DN\_PERFORMANCE". | DnPerformance |
| pfdDetermInfos | array(PfdDeterminationInfo) | C | 1..N | Represents the PFD Determination information for a known application identifier.Shall be present when the requested event is "PFD\_DETERMINATION". | PfdDetermination |
| NOTE 1: If the "start" attribute and the "expiry" attribute are both provided, the DateTime of the "expiry" attribute shall not be earlier than the DateTime of the "start" attribute.NOTE 2: The "qosFlowRetThd" and "ranUeThrouThd" attributes in QosSustainabilityInfo data type are not applicable.NOTE 3: This attribute shall be included when ADRF is deployed.NOTE 4: If the "UeMobilityExt2\_eNA" feature is supported and the "locationGranReq" attribute value "LON\_AND\_LAT\_LEVEL" is requested, the "geoLoc" attribute within the "locInfos" attribute in the "UeMobility" type shall be provided to report the geographical location (longitude and latitude level). |

Editor's Note: The definition of "pfdDetermInfos" in the OpenAPI file is FFS.

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

# A.2 Nnwdaf\_EventsSubscription API

openapi: 3.0.0

info:

 version: 1.3.0-alpha.2

 title: Nnwdaf\_EventsSubscription

 description: |

 Nnwdaf\_EventsSubscription Service API.

 © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

 All rights reserved.

externalDocs:

 description: 3GPP TS 29.520 V18.1.0; 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 clause 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/<apiVersion>/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'

 '502':

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

 '503':

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

 default:

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

 callbacks:

 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'

 '502':

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

 '503':

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

 default:

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

 /subscriptions/{subscriptionId}:

 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':

 $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'

 '502':

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

 '503':

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

 default:

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

 put:

 summary: 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':

 $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'

 '502':

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

 '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)

 security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - nnwdaf-eventssubscription:transfer

 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/<apiVersion>/transfers/{transferId}

 required: true

 schema:

 type: string

 '204':

 description: >

 No Content. The receipt of the information about analytics subscription(s) that are

 requested to be transferred and the ability to handle this information (e.g. execute the

 steps required to transfer an analytics subscription directly) is confirmed.

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '502':

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

 '503':

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

 default:

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

 /transfers/{transferId}:

 delete:

 summary: Delete an existing Individual NWDAF Event Subscription Transfer

 operationId: DeleteNWDAFEventSubscriptionTransfer

 tags:

 - Individual NWDAF Event Subscription Transfer (Document)

 security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - nnwdaf-eventssubscription:transfer

 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'

 '502':

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

 '503':

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

 default:

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

 put:

 summary: Update an existing Individual NWDAF Event Subscription Transfer

 operationId: UpdateNWDAFEventSubscriptionTransfer

 tags:

 - Individual NWDAF Event Subscription Transfer (Document)

 security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - nnwdaf-eventssubscription:transfer

 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'

 '502':

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

 '503':

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

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 nnwdaf-eventssubscription: Access to the Nnwdaf\_EventsSubscription API

 nnwdaf-eventssubscription:transfer: >

 Access to service operations applying to NWDAF event subscription transfer.

 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'

 notifCorrId:

 type: string

 description: Notification correlation identifier.

 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: '#/components/schemas/PrevSubInfo'

 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.

 deviations:

 type: array

 items:

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

 minItems: 1

 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'

 maxTopAppDlNbr:

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

 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

 ueCommReqs:

 type: array

 items:

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

 minItems: 1

 ueMobilityReqs:

 type: array

 items:

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

 minItems: 1

 userDataConOrderCri:

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

 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'

 ratFreqs:

 type: array

 items:

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

 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

 upfInfo:

 $ref: 'TS29508\_Nsmf\_EventExposure.yaml#/components/schemas/UpfInformation'

 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

 notifCorrId:

 type: string

 description: Notification correlation identifier.

 oldSubscriptionId:

 type: string

 description: >

 Subscription ID which was allocated by the source NWDAF. This parameter shall be present

 if the notification is for informing the assignment of a new Subscription Id by the

 target NWDAF.

 resourceUri:

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

 termCause:

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

 transEvents:

 type: array

 items:

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

 minItems: 1

 required:

 - subscriptionId

 oneOf:

 - required: [eventNotifications]

 - allOf:

 - required: [resourceUri]

 - required: [oldSubscriptionId]

 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

 smccExps:

 type: array

 items:

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

 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'

 ueLocs:

 type: array

 items:

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

 minItems: 1

 upfInfo:

 $ref: 'TS29508\_Nsmf\_EventExposure.yaml#/components/schemas/UpfInformation'

 dnai:

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

 appServerInst:

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

 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'

 ratFreq:

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

 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.

 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

 description: >

 Indicates whether the Load Level Threshold is met or exceeded by the statistics value.

 Set to "true" if the Load Level Threshold is met or exceeded, otherwise set to "false".

 Shall be present if one of the element in the "listOfAnaSubsets" attribute was set to

 EXCEED\_LOAD\_LEVEL\_THR\_IND.

 networkArea:

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

 timePeriod:

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

 resUsgThrCrossTimePeriod:

 type: array

 items:

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

 minItems: 1

 description: >

 Each element indicates the time elapsed between times each threshold is met or exceeded

 or crossed. The start time and end time are the exact time stamps of the resource usage

 threshold is reached or exceeded. May be present if the "listOfAnaSubsets" attribute is

 provided and the maximum number of instances shall not exceed the value provided in the

 "numOfExceedLoadLevelThr" attribute.

 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 or the "repetitionPeriod" attribute is included within the

 EventSubscription type.

 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'

 histAnaTimePeriod:

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

 TargetUeInformation:

 description: Identifies the target UE information.

 type: object

 properties:

 anyUe:

 type: boolean

 description: >

 Identifies any UE when setting to "true". Default value is "false" if omitted.

 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

 intGroupIds:

 type: array

 items:

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

 minItems: 1

 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

 allOf:

 - required: [duration]

 - required: [locInfos]

 - oneOf:

 - required: [ts]

 - required: [recurringTime]

 LocationInfo:

 description: Represents UE location information.

 type: object

 properties:

 loc:

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

 geoLoc:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicalCoordinates'

 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

 description: >

 This attribute indicates whether the UE communicates periodically or not. Set to "true"

 to indicate the UE communicates periodically, otherwise set to "false" or omitted.

 confidence:

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

 anaOfAppList:

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

 sessInactTimer:

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

 allOf:

 - required: [commDur]

 - required: [trafChar]

 - oneOf:

 - required: [ts]

 - required: [recurringTime]

 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'

 anyOf:

 - required: [ulVol]

 - required: [dlVol]

 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'

 required:

 - networkArea

 - congestionInfo

 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'

 oneOf:

 - required: [appId]

 - required: [ipTrafficFilter]

 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'

 oneOf:

 - required: [qosFlowRetThd]

 - required: [ranUeThrouThd]

 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'

 deviceSpeed:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/VelocityEstimate'

 deviceType:

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

 oneOf:

 - required: [5qi]

 - required: [resType]

 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'

 svcExpLevel:

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

 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'

 allOf:

 - required: [nfType]

 - required: [nfInstanceId]

 - anyOf:

 - required: [nfStatus]

 - required: [nfCpuUsage]

 - required: [nfMemoryUsage]

 - required: [nfStorageUsage]

 - required: [nfLoadLevelAverage]

 - required: [nfLoadLevelPeak]

 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'

 anyOf:

 - required: [statusRegistered]

 - required: [statusUnregistered]

 - required: [statusUndiscoverable]

 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'

 amount:

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

 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'

 oneOf:

 - required: [ipTrafficFilter]

 - required: [ethTrafficFilter]

 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'

 oneOf:

 - allOf:

 - required: [relFlowNum]

 - required: [relTimeUnit]

 - required: [relFlowRatio]

 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'

 orderCriterion:

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

 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'

 anaPeriod:

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

 relativeRatio:

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

 absoluteNum:

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

 confidence:

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

 allOf:

 - required: [networkArea]

 - required: [nwPerfType]

 - oneOf:

 - required: [relativeRatio]

 - required: [absoluteNum]

 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:

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

 variance:

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

 skewness:

 $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

 failTransEventReports:

 type: array

 items:

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

 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

 required:

 - transReqType

 - nwdafEvSub

 - consumerId

 ModelInfo:

 description: Contains information about an ML model.

 type: object

 properties:

 analyticsId:

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

 mlModelInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - analyticsId

 - mlModelInfos

 MLModelInfo:

 description: Contains information about an ML models.

 type: object

 properties:

 mlFileAddrs:

 type: array

 items:

 $ref: 'TS29520\_Nnwdaf\_MLModelProvision.yaml#/components/schemas/MLModelAddr'

 minItems: 1

 modelProvId:

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

 modelProvSetId:

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

 oneOf:

 - required: [modelProvId]

 - required: [modelProvSetId]

 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'

 upfInfo:

 $ref: 'TS29508\_Nsmf\_EventExposure.yaml#/components/schemas/UpfInformation'

 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'

 required:

 - perfData

 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

 - lowBase

 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:

 type: integer

 description: Integer where the allowed values correspond to 1, 2, 3 only.

 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'

 allOf:

 - oneOf:

 - required: [ueLoc]

 - required: [snssai]

 - anyOf:

 - required: [disperAmount]

 - required: [disperClass]

 - required: [usageRank]

 - required: [percentileRank]

 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'

 obsvRedTransExp:

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

 redTransStatus:

 type: boolean

 description: >

 Redundant Transmission Status. Set to "true" if redundant transmission was activated,

 otherwise set to "false". Default value is "false" if omitted.

 ueRatio:

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

 confidence:

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

 required:

 - tsStart

 - tsDuration

 - obsvRedTransExp

 ObservedRedundantTransExp:

 description: Represents the observed redundant transmission experience related information.

 type: object

 properties:

 avgPktDropRateUl:

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

 varPktDropRateUl:

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

 avgPktDropRateDl:

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

 varPktDropRateDl:

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

 avgPktDelayUl:

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

 varPktDelayUl:

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

 avgPktDelayDl:

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

 varPktDelayDl:

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

 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'

 required:

 - appId

 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'

 required:

 - n4SessId

 - sessInactiveTimer

 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

 RatFreqInformation:

 description: Represents the RAT type and/or Frequency information.

 type: object

 properties:

 allFreq:

 type: boolean

 description: >

 Set to "true" to indicate to handle all the frequencies the NWDAF received, otherwise

 set to "false" or omit. The "allFreq" attribute and the "freq" attribute are mutually

 exclusive.

 allRat:

 type: boolean

 description: >

 Set to "true" to indicate to handle all the RAT Types the NWDAF received, otherwise

 set to "false" or omit. The "allRat" attribute and the "ratType" attribute are mutually

 exclusive.

 freq:

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

 ratType:

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

 svcExpThreshold:

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

 matchingDir:

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

 PrevSubInfo:

 description: Information of the previous subscription.

 type: object

 properties:

 producerId:

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

 producerSetId:

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

 subscriptionId:

 type: string

 description: The identifier of a subscription.

 nfAnaEvents:

 type: array

 items:

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

 minItems: 1

 ueAnaEvents:

 type: array

 items:

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

 minItems: 1

 required:

 - subscriptionId

 oneOf:

 - required: [producerId]

 - required: [producerSetId]

 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'

 nfSetId:

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

 taiList:

 type: array

 items:

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

 minItems: 1

 oneOf:

 - oneOf:

 - required: [nfId]

 - required: [nfSetId]

 - required: [taiList]

 UeCommReq:

 description: UE communication analytics requirement.

 type: object

 properties:

 orderCriterion:

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

 orderDirection:

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

 UeMobilityReq:

 description: UE mobility analytics requirement.

 type: object

 properties:

 orderCriterion:

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

 orderDirection:

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

 locationGranReq:

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

#

# ENUMERATIONS DATA TYPES

#

 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: |

 Represents the notification methods for the subscribed events.

 Possible values are:

 - PERIODIC: The notification of the subscribed NWDAF Event is periodical. The period

 between the notifications is identified by repetitionPeriod and represents time in

 seconds.

 - 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

 - SM\_CONGESTION

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Describes the NWDAF Events.

 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.

 - SM\_CONGESTION: Indicates the Session Management Congestion Control Experience information

 for specific DNN and/or S-NSSAI.

 Accuracy:

 anyOf:

 - type: string

 enum:

 - LOW

 - MEDIUM

 - HIGH

 - HIGHEST

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the preferred level of accuracy of the analytics.

 Possible values are:

 - LOW: Low accuracy.

 - MEDIUM: Medium accuracy.

 - HIGH: High accuracy.

 - HIGHEST: Highest 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: |

 Indicates the congestion analytics type.

 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: |

 Describes the Exception Id.

 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: |

 Represents the Exception Trend.

 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: |

 Represents the unit for the session active time.

 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: |

 Represents the network performance types.

 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: |

 Represents the expected UE analytics type.

 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: |

 Represents the matching direction when crossing a threshold.

 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: |

 Represents the failure reason.

 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: |

 Represents the types of analytics metadata information that can be requested.

 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: |

 Represents the dataset statistical properties.

 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: |

 Represents the output strategy used for the analytics reporting.

 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: |

 Represents the request type for the analytics subscription transfer.

 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

 - NF\_LOAD\_AVG\_IN\_AOI

 - 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

 - UE\_LOCATION

 - LIST\_OF\_HIGH\_EXP\_UE

 - LIST\_OF\_MEDIUM\_EXP\_UE

 - LIST\_OF\_LOW\_EXP\_UE

 - AVG\_UL\_PKT\_DROP\_RATE

 - VAR\_UL\_PKT\_DROP\_RATE

 - AVG\_DL\_PKT\_DROP\_RATE

 - VAR\_DL\_PKT\_DROP\_RATE

 - AVG\_UL\_PKT\_DELAY

 - VAR\_UL\_PKT\_DELAY

 - AVG\_DL\_PKT\_DELAY

 - VAR\_DL\_PKT\_DELAY

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the analytics subset.

 Possible values are:

 - NUM\_OF\_UE\_REG: The number of UE registered. This value is only applicable to

 NSI\_LOAD\_LEVEL event.

 - NUM\_OF\_PDU\_SESS\_ESTBL: The number of PDU sessions established. This value is only

 applicable to NSI\_LOAD\_LEVEL 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.

 - 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.

 - NF\_LOAD\_AVG\_IN\_AOI: The average load of the NF instances over the area of interest. 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.

 - UE\_LOCATION: Indicates UE location information. This value is only applicable to

 SERVICE\_EXPERIENCE event.

 - LIST\_OF\_HIGH\_EXP\_UE: Indicates list of high experienced UE. This value is only applicable

 to SM\_CONGESTION event.

 - LIST\_OF\_MEDIUM\_EXP\_UE: Indicates list of medium experienced UE. This value is only

 applicable to SM\_CONGESTION event.

 - LIST\_OF\_LOW\_EXP\_UE: Indicates list of low experienced UE. This value is only applicable to

 SM\_CONGESTION event.

 - AVG\_UL\_PKT\_DROP\_RATE: Indicates average uplink packet drop rate on GTP-U path on N3. This

 value is only applicable to RED\_TRANS\_EXP event.

 - VAR\_UL\_PKT\_DROP\_RATE: Indicates variance of uplink packet drop rate on GTP-U path on N3.

 This value is only applicable to RED\_TRANS\_EXP event.

 - AVG\_DL\_PKT\_DROP\_RATE: Indicates average downlink packet drop rate on GTP-U path on N3.

 This value is only applicable to RED\_TRANS\_EXP event.

 - VAR\_DL\_PKT\_DROP\_RATE: Indicates variance of downlink packet drop rate on GTP-U path on N3.

 This value is only applicable to RED\_TRANS\_EXP event.

 - AVG\_UL\_PKT\_DELAY: Indicates average uplink packet delay round trip on GTP-U path on N3.

 This value is only applicable to RED\_TRANS\_EXP event.

 - VAR\_UL\_PKT\_DELAY: Indicates variance uplink packet delay round trip on GTP-U path on N3.

 This value is only applicable to RED\_TRANS\_EXP event.

 - AVG\_DL\_PKT\_DELAY: Indicates average downlink packet delay round trip on GTP-U path on N3.

 This value is only applicable to RED\_TRANS\_EXP event.

 - VAR\_DL\_PKT\_DELAY: Indicates variance downlink packet delay round trip on GTP-U path on N3.

 This value is only applicable to RED\_TRANS\_EXP 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: |

 Represents the dispersion type.

 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: |

 Represents the dispersion class.

 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: |

 Represents the order criterion for the list of dispersion.

 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.

 DeviceType:

 anyOf:

 - type: string

 enum:

 - MOBILE\_PHONE

 - SMART\_PHONE

 - TABLET

 - DONGLE

 - MODEM

 - WLAN\_ROUTER

 - IOT\_DEVICE

 - WEARABLE

 - MOBILE\_TEST\_PLATFORM

 - UNDEFINED

 - 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:

 - MOBILE\_PHONE: Mobile Phone.

 - SMART\_PHONE: Smartphone.

 - TABLET: Tablet.

 - DONGLE: Dongle.

 - MODEM: Modem.

 - WLAN\_ROUTER: WLAN Router.

 - IOT\_DEVICE: IoT Device.

 - WEARABLE: Wearable.

 - MOBILE\_TEST\_PLATFORM: Mobile Test Platform.

 - UNDEFINED: Undefined.

 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: |

 Represents the order criterion for the list of Redundant Transmission Experience.

 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: |

 Represents the order criterion for the list of WLAN performance information.

 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

 - 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: |

 Represents the type of the service experience analytics.

 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.

 - OTHER: Indicates that the service experience analytics is for other 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: |

 Represents the order criterion for the list of DN performance analytics.

 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.

 TermCause:

 anyOf:

 - type: string

 enum:

 - USER\_CONSENT\_REVOKED

 - NWDAF\_OVERLOAD

 - UE\_LEFT\_AREA

 - type: string

 description: >

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

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

 description: |

 Represents the cause for the analytics subscription termination request.

 Possible values are:

 - USER\_CONSENT\_REVOKED: The user consent has been revoked.

 - NWDAF\_OVERLOAD: The NWDAF is overloaded.

 - UE\_LEFT\_AREA: The UE has moved out of the NWDAF serving area.

 UserDataConOrderCrit:

 anyOf:

 - type: string

 enum:

 - APPLICABLE\_TIME\_WINDOW

 - NETWORK\_STATUS\_INDICATION

 - 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:

 - APPLICABLE\_TIME\_WINDOW: The ordering criterion is the Applicable Time Window.

 - NETWORK\_STATUS\_INDICATION: The ordering criterion is the network status indication.

 UeMobilityOrderCriterion:

 anyOf:

 - type: string

 enum:

 - TIME\_SLOT

 - 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: The ordering criterion is the time slot.

 UeCommOrderCriterion:

 anyOf:

 - type: string

 enum:

 - START\_TIME

 - DURATION

 - 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:

 - START\_TIME: The ordering criterion of the analytics is the start time.

 - DURATION: The ordering criterion of the analytics is the duration of the communication.

 NetworkPerfOrderCriterion:

 anyOf:

 - type: string

 enum:

 - NUMBER\_OF\_UES

 - COMMUNICATION\_PERF

 - MOBILITY\_PERF

 - 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:

 - NUMBER\_OF\_UES: The ordering criterion of the analytics is the number of UEs.

 - COMMUNICATION\_PERF: The ordering criterion of the analytics is the communication performance.

 - MOBILITY\_PERF: The ordering criterion of the analytics is themobility performance.

 LocationGranularity:

 anyOf:

 - type: string

 enum:

 - TA\_LEVEL

 - CELL\_LEVEL

 - LON\_AND\_LAT\_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:

 - TA\_LEVEL: Indicates location granularity of TA level.

 - CELL\_LEVEL: Indicates location granularity of cell level.

 - LON\_ANG\_LAT\_LEVEL: Indicates location granularity of longitude and latitude level.

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