**3GPP TSG-CT WG3 Meeting #138 *C3-246455***

**Orlando, US, 18 - 22 November, 2024 (Revision of C3-246267)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.520** | **CR** | **0991** | **rev** | **1** | **Current version:** | **19.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Update TTC predictions in Relative Proximity Analytics | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | UAS\_Ph3 | | | | |  | ***Date:*** | | | 2024-11-06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19) Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | SA2#165 agreed TS 23.288 CR 1241 (S2-2410859) added sub-predictions under Time To Collision for Collision space and Collision direction in the Output of Relative Proximity Analytics for UAS, hence needs to be updated accordingly in this TS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding sub-predictions under Time To Collision for Collision space and Collision direction with new feature support. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not supporting stage 2 requirement on adding sub-predictions under Time To Collision for Collision space and Collision direction in the Relative Proximity Analytics. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 5.1.6.2.104, 5.1.8, 5.2.6.2.2, 5.2.8, A.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.288 CR 1241 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR introduces backwards compatible feature in the OpenAPI file of Nnwdaf\_EventsSubscription API. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

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

# 2 References

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

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

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

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

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

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[3] Void.

[4] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[5] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".

[6] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[7] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

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

[9] IETF RFC 9113: "HTTP/2".

[10] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[11] OpenAPI: "OpenAPI Specification Version 3.0.0", https://spec.openapis.org/oas/v3.0.0

[12] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[13] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

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

[15] IETF RFC 9457: "Problem Details for HTTP APIs".

[16] 3GPP TR 21.900: "Technical Specification Group working methods".

[17] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[18] 3GPP TS 29.554: "5G System; Background Data Transfer Policy Control Service; Stage 3".

[19] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[20] 3GPP TS 29.523: "5G System; Policy Control Event Exposure Service; Stage 3".

[21] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[22] 3GPP TS 29.517: "5G System; Application Function (AF) event exposure service".

[23] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[24] 3GPP TS 29.531: "5G System; Network Slice Selection Services; Stage 3".

[25] 3GPP TS 29.552: "5G System; Network Data Analytics signalling flows; Stage 3".

[26] 3GPP TS 29.574: "5G System; Data Collection Coordination Services; Stage 3".

[27] 3GPP TS 29.575: "5G System; Analytics Data Repository Services; Stage 3".

[28] 3GPP TS 29.576: "5G System; Messaging Framework Adaptor Services; Stage 3".

[29] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

[30] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[31] IANA: "SMI Network Management Private Enterprise Codes", <http://www.iana.org/assignments/enterprise-numbers>.

[32] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[33] IETF RFC 6733: "Diameter Base Protocol".

[34] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

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

##### 5.1.6.2.104 Type TimeToCollisionInfo

Table 5.1.6.2.104-1: Definition of type TimeToCollisionInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ttc | DateTime | O | 0..1 | Time until the predicted collision between UEs to which the proximity information applies. |  |
| accuracy | Uinteger | O | 0..1 | Indicates the accuracy of TTC (dependent on both the UE location accuracy and confidence of the prediction).  Minimum = 0. Maximum = 100. |  |
| confidence | Uinteger | O | 0..1 | Indicates the confidence of the prediction for TTC. (NOTE)  Minimum = 0. Maximum = 100. |  |
| collisionSpace | Uinteger | O | 0..1 | Indicates the predicted space of the collision at the collision time in units of milliseconds, e.g. Ellipsoid point with altitude and uncertainty ellipsoid in TS 23.032 [34]. | RelativeProximityExt |
| colSpcConfidence | Uinteger | O | 0..1 | Indicates the confidence of the prediction for TTC. (NOTE)  Minimum = 0. Maximum = 100. | RelativeProximityExt |
| NOTE: If the requested period identified by the "startTs" and "endTs" attributes in the "EventReportingRequirement" type is a future time period, then 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. | | | | | |

Editor’s Note: The collision direction related attributes are not specified FFS and waiting for SA2 updates.

\*\*\* 2nd 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 for the extensions to the event related to UE communication, including support of reporting the analytics of the application list used by UE, N4 Session inactivity timer, and whether the UE communicates periodically or not.  Supporting this feature also requires the support of UeCommunication feature. |
| 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, including support more level of accuracy and support for use case context sent by the NF service consumer to the NWDAF. |
| 28 | EnAbnormalBehaviour | This feature indicates support for the enhancements of UE Abnormal Behaviour.  Supporting this feature also requires the support of AbnormalBehaviour feature. |
| 29 | EnQoSSustainability | This feature indicates support for the enhancements of QoS Sustainability.  Supporting this feature also requires the support of QoSSustainability feature. |
| 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 linear distance threshold. Supporting this feature also requires the support of UeMobility and UeMobilityExt features. |
| 32 | UeCommunicationExt\_eNA | This feature indicates support for the enhancements of UE Communication, including to indicate the ordering criterion for the list of analytics. Supporting this feature also requires the support of UeCommunication feature. |
| 33 | NetworkPerformanceExt\_eNA | This feature indicates support for the enhancements of Network Performance, including support of ordering criterion for the list of analytics and analytics target period subset. Supporting this feature also requires the support of NetworkPerformance feature. |
| 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 | Void | Void |
| 37 | PfdDetermination | This feature indicates support for functionality related to NWDAF assisted PFD Determination information for known application identifier(s). |
| 38 | ServiceExperienceExt2\_eNA | This feature indicates support for the extensions to the event related to service experience supporting eNA, including support for PDU Session parameters information for service experience analytics. Supporting this feature also requires the support of feature ServiceExperience. |
| 39 | DnPerformanceExt\_AIML | This feature indicates support for extensions to the event related to DN Performance supporting AIML, including support of extended DN Performance Analytics for group of UEs. Supporting this feature also requires the support of feature DnPerformance. |
| 40 | UeMobilityExt\_AIML | This feature indicates support for further extensions to the event related to UE mobility supporting AIML, including UE’s geographical distribution and direction analytics. Supporting this feature also requires the support of feature UeMobility. |
| 41 | PduSesTraffic | This feature indicates support of the analytics related to PDU Session traffic information. |
| 42 | E2eDataVolTransTime | This feature indicates support for E2E data volume transfer time analytics |
| 43 | DispersionExt\_eNA | This feature indicates support for the enhancements of Dispersion, including the support of preferred granularity of UE location. Supporting this feature also requires the support of Dispersion feature. |
| 44 | WlanPerformanceExt\_AIML | This feature indicates support for the enhancements of WLAN performance supporting AIML, including support of analytics per UE granularity. Supporting this feature also requires the support of feature WlanPerformance. |
| 45 | NetworkPerformanceExt\_AIML | This feature indicates support of the network performance enhancements for AI/ML-based Services. Within this feature the following enhacements are covered:  - support of providing gNB resource usage for GBR traffic and Delay-critical GBR traffic.  Supporting this feature also requires the support of NetworkPerformance feature. |
| 46 | DnPerformanceExt\_eNA | This feature indicates support for extensions to the event related to DN Performance, including support of number of UEs. Supporting this feature also requires the support of feature DnPerformance. |
| 47 | AnalyticsAccuracy | This feature indicates support for the Analytics Accuracy information. |
| 48 | RedundantTransExpExt\_eNA | This feature indicates support extensions to the event related to redundant transmission experience analytics information including:  - support of providing the E2E UL/DL packet loss rate (average, variance), E2E UL/DL packet delay (average, variance) in the analytics.  - support of spatial and temporal granularity size.  Supporting this feature also requires the support of feature RedundantTransmissionExp. |
| 49 | WlanPerfExt\_eNA | This feature indicates support for the enhancements of WLAN performance supporting AIML, including support of temporal granularity size. Supporting this feature also requires the support of feature WlanPerformance. |
| 50 | MovementBehaviour | This feature indicates support for the Movement Behaviour information. |
| 51 | LocAccuracy | This feature indicates support for the Location Accuracy analytics. |
| 52 | RelativeProximity | This feature indicates support for the Relative Proximity analytics. |
| 53 | StatisticsFailure | This feature indicates support for partial failure report for statistics during event notification.  Supporting this feature also requires the support of EneNA feature. |
| 54 | RoamingAnalytics | This feature indicates support for the Roaming analytics. |
| 55 | PredictionError | This feature indicates support for Prediction Error handling. |
| 58 | RelativeProximityExt | This feature indicates support for the enhancements of Relative Proximity Analytics in Rel-19.  The following functionalities are supported:  - Support enhancement of TTC prediction in Relative Proximity Analytics.  Supporting this feature also requires the support of RelativeProximity feature. |

\*\*\* 3rd 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 statistics analytics information is applicable or predictions analytics information is valid. (NOTE 1) (NOTE 7) | |  | |
| expiry | | DateTime | | O | | 0..1 | | It defines the expiration time after which the statistics analytics information is applicable or predictions analytics information is invalid. (NOTE 1) (NOTE 7) | |  | |
| 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 5) (NOTE 8) | | UeMobility | |
| ueComms | | array(UeCommunication) | | C | | 1..N | | The UE communication information.  When the requested event is "UE\_COMM", the "ueComms" attribute shall be included. (NOTE 9) | | 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. (NOTE 6) | | WlanPerformance | |
| dnPerfInfos | | array(DnPerfInfo) | | C | | 1..N | | The DN performance information.  Shall be present when the requested event is "DN\_PERFORMANCE". (NOTE 4) | | DnPerformance | |
| pduSesTrafInfos | | array(PduSesTrafficInfo) | | C | | 1..N | | The PDU Session traffic related information.  Shall be present when the requested event is "PDU\_SESSION\_TRAFFIC". | | PduSesTraffic | |
| dataVlTrnsTmInfos | | array(E2eDataVolTransTimeInfo) | | C | | 1..N | | E2E data volume transfer time information.  Shall be present when the requested event is "E2E\_DATA\_VOL\_TRANS\_TIME". | | E2eDataVolTransTime | |
| locAccInfos | | array(LocAccuracyInfo) | | C | | 1..N | | The Location Accuracy related information.  It shall be present when the requested event is "LOC\_ACCURACY". | | LocAccuracy | |
| accuInfo | | AccuracyInfo | | C | | 0..1 | | The analytics accuracy information.  Shall be provided if the analytics accuracy requirement was requested in the "accuReq" attribute and the "cancelAccuInd" attribute is set to "false" or omitted.  (NOTE 10) | | AnalyticsAccuracy | |
| cancelAccuInd | | boolean | | O | | 0..1 | | Indicates cancelled request of the analytics accuracy information.  Set to "true" indicates the NWDAF cancelled request of analytics accuracy information as the NWDAF does not support the accuracy checking capability.  Otherwise set to "false". Default value is "false" if omitted. | | AnalyticsAccuracy | |
| movBehavInfos | | array(MovBehavInfo) | | C | | 1..N | | The Movement Behaviour information.  Shall be present when the requested event is "MOVEMENT\_BEHAVIOUR". | | MovementBehaviour | |
| relProxInfos | | array(RelProxInfo) | | C | | 1..N | | The Relative Proximity information.  Shall be present when the requested event is "RELATIVE\_PROXIMITY".  (NOTE 12) | | RelativeProximity | |
| 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: The "minTrafficRate", "aggTrafficRate", "varTrafficRate", "trafRateUeIds", "avePacketDelay", "maxPacketDelay", "varPacketDelay", "packDelayUeIds", "maxPacketLossRate", "varPacketLossRate" and "packetLossUeIds" attribute(s) within the DnPerfInfo data type is applicable only if the "DnPerformanceExt\_AIML" feature is supported.  NOTE 5: The "directionInfos" attribute and the "geoDistrInfos" attribute in the "locInfos" attribute within the UeMobility data type are applicable only if the "UeMobilityExt\_AIML" feature is supported.  NOTE 6: The "wlanPerUeIdInfos" attribute may be included within the "wlanInfos" attribute only if the "WlanPerformanceExt\_AIML" feature is supported.  NOTE 7: The validity period specified by "start" and "expiry" attributes is determined by NWDAF internal logic, and is a subset of the analytics target period indicated by "startTs" and "endTs", or "offsetPeriod" attributes contained in "ana-req" attribute. If the analytics target period refers to the past, the period specified by these two attributes indicate the time period over which the statistics are applicable. If the analytics target period refers to the future, the period specified by these two attributes indicate the time period over which the predictions are valid.  NOTE 8: 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).  NOTE 9: The "perioCommInd", "anaOfAppList" and "sessInactTimer" attributes within the UeCommunication data type are applicable only if the "UeCommunicationExt" feature is supported.  NOTE 10: Only the "accuracyVal" and "accuSampleNbr" attributes within the AccuracyInfo data type are applicable.  NOTE 12: When the "RelativeProximityExt" feature is supported, if the "TIME\_TO\_COLLISION" value within the "listOfAnaSubsets" attribute is provided in the request, the "RelativeProximityExt" feature supported attributes within the "ttcInfo" attribute may be provided. | | | | | | | | | | | |

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

### 5.2.8 Feature negotiation

The optional features in table 5.2.8-1 are defined for the Nnwdaf\_AnalyticsInfo API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [6].

Table 5.2.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | UeMobility | This feature indicates the support of analytics based on UE mobility information. |
| 2 | UeCommunication | This feature indicates the support of analytics based on UE communication information. |
| 3 | NetworkPerformance | This feature indicates the support of analytics based on network performance. |
| 4 | ServiceExperience | This feature indicates support for the event related to service experience. |
| 5 | QoSSustainability | This feature indicates support for the event related to QoS sustainability. |
| 6 | AbnormalBehaviour | This feature indicates support for the event related to abnormal behaviour information. |
| 7 | UserDataCongestion | This feature indicates the support of the analytics related on user data congestion. |
| 8 | NfLoad | This feature indicates the support of the analytics related to the load of NF instances. |
| 9 | NsiLoad | This feature indicates the support of the analytics related to the load level of Network Slice and the optionally associated Network Slice Instance. |
| 10 | EneNA | This feature indicates support for the enhancements of network data analytics requirements. |
| 11 | 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. |
| 12 | Aggregation | This feature indicates support for analytics aggregation. |
| 13 | 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. |
| 14 | 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. |
| 15 | SMCCE | This feature indicates support for the event related to SM congestion control experience. |
| 16 | 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 required the support of feature NfLoad. |
| 17 | Dispersion | This feature indicates support for the event related to dispersion analytics information. |
| 18 | RedundantTransmissionExp | This feature indicates support for the event related to redundant transmission experience analytics information. |
| 19 | WlanPerformance | This feature indicates support of the event related to WLAN performance analytics information. |
| 20 | 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. |
| 21 | DnPerformance | This feature indicates the support of the analytics related to DN performance. |
| 22 | AnaCtxTransfer | This feature indicates the support of analytics context transfer. |
| 23 | UserConsent | Indicates the support of detailed handling of user consent, e.g. error responses related to the lack of user consent. |
| 24 | 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. |
| 25 | UeMobilityExt2\_eNA | This feature indicates support for the enhancements of UE mobility, including support of ordering criterion. Supporting this feature also requires the support of UeMobility and UeMobilityExt features. |
| 26 | UeCommunicationExt\_eNA | This feature indicates support for the enhancements of UE Communication, including support of ordering criterion. Supporting this feature also requires the support of UeCommunication feature. |
| 27 | NetworkPerformanceExt\_eNA | This feature indicates support for the enhancements of Network Performance, including support of ordering criterion for the list of analytics and analytics target period subset. Supporting this feature also requires the support of NetworkPerformance feature. |
| 28 | ServiceExperienceExt2\_eNA | This feature indicates extensions to the event related to service experience supporting eNA, including support for PDU Session parameters information for service experience analytics. Supporting this feature also requires the support of feature ServiceExperience. |
| 29 | DnPerformanceExt\_AIML | This feature indicates support for extensions to the event related to DN Performance supporting AIML, including support of extended DN Performance Analytics for group of UEs. Supporting this feature also requires the support of feature DnPerformance. |
| 30 | UeMobilityExt\_AIML | This feature indicates support for further extensions to the event related to UE mobility supporting AIML, including support of UE’s geographical distribution and direction analytics. Supporting this feature also requires the support of feature UeMobility. |
| 31 | PduSesTraffic | This feature indicates support of the analytics related to PDU Session traffic information. |
| 32 | DispersionExt\_eNA | This feature indicates support for the enhancements of Dispersion, including the support of preferred granularity of UE location. Supporting this feature also requires the support of Dispersion feature. |
| 33 | WlanPerformanceExt\_AIML | This feature indicates support for the enhancements of WLAN performance supporting AIML, including support of analytics per UE granularity. Supporting this feature also requires the support of feature WlanPerformance. |
| 34 | NetworkPerformanceExt\_AIML | This feature indicates support of the network performance enhancements for AI/ML-based Services. Within this feature the following enhacements are covered:  - support of providing gNB resource usage for GBR traffic and Delay-critical GBR traffic.  Supporting this feature also requires the support of NetworkPerformance feature. |
| 35 | E2eDataVolTransTime | This feature indicates support for E2E data volume transfer time analytics |
| 36 | AnalyticsAccuracy | This feature indicates support for the Analytics Accuracy information. |
| 37 | EnAbnormalBehaviour | This feature indicates support for the enhancements of UE Abnormal Behaviour.  Supporting this feature also requires the support of AbnormalBehaviour feature. |
| 38 | UeCommunicationExt | This feature indicates the support for the extensions to the event related to UE communication, including support of reporting the analytics of the application list used by UE, N4 Session inactivity timer, and whether the UE communicates periodically or not.  Supporting this feature also requires the support of UeCommunication feature. |
| 39 | QoSSustainExt\_eNA | This feature indicates support for the enhancements of QoS Sustainability, including:  - support of temporal and spatial granularity size.  Supporting this feature also requires the support of QoSSustainability feature. |
| 40 | WlanPerfExt\_eNA | This feature indicates support for the enhancements of WLAN performance, including:  - support of temporal granularity size.  Supporting this feature also requires the support of feature WlanPerformance. |
| 41 | DnPerfExt\_eNA | This feature indicates support for extensions to the event related to DN Performance, including support of number of UEs. Supporting this feature also requires the support of feature DnPerformance. |
| 42 | QoSSustainExt\_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. |
| 43 | MovementBehaviour | This feature indicates support for the Movement Behaviour information. |
| 44 | LocAccuracy | This feature indicates support for the Location Accuracy analytics. |
| 45 | RelativeProximity | This feature indicates support for the Relative Proximity analytics. |
| 46 | ENAExt | This feature indicates support for the general enhancements of network data analytics requirements, including support more level of accuracy and support for use case context sent by the NF service consumer to the NWDAF. |
| 47 | RoamingAnalytics | This feature indicates support for the Roaming analytics. |
| 48 | PredictionError | This feature indicates support for Prediction Error handling. |
| 49 | EnAnaCtxTransfer | This feature indicates the enhancement for the analytics context transfer, including the support of transferring the Analytics Accuracy and ML Model accuracy context types.  Supporting this feature also requires the support of feature "AnaCtxTransfer". |
| 51 | RelativeProximityExt | This feature indicates support for the enhancements of Relative Proximity Analytics in Rel-19.  The following functionalities are supported:  - Support enhancement of TTC prediction in Relative Proximity Analytics.  Supporting this feature also requires the support of RelativeProximity feature. |

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

# A.2 Nnwdaf\_EventsSubscription API

openapi: 3.0.0

info:

version: 1.3.1

title: Nnwdaf\_EventsSubscription

description: |

Nnwdaf\_EventsSubscription Service API.

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externalDocs:

description: 3GPP TS 29.520 V18.7.0; 5G System; Network Data Analytics Services.

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

security:

- {}

- oAuth2ClientCredentials:

- nnwdaf-eventssubscription

servers:

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

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in 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'

location:

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

temporalGranSize:

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

spatialGranSizeTa:

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

spatialGranSizeCell:

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

fineGranAreas:

type: array

items:

$ref: 'TS29522\_AMPolicyAuthorization.yaml#/components/schemas/GeographicalArea'

minItems: 1

description: Indicates the fine granularity areas to which the subscription applies.

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'

roamingInfo:

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

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

pduSesInfos:

type: array

items:

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

minItems: 1

useCaseCxt:

type: string

description: >

Indicates the context of usage of the analytics. The value and format of this parameter

are not standardized.

pduSesTrafReqs:

type: array

items:

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

minItems: 1

locAccReqs:

type: array

items:

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

minItems: 1

locGranularity:

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

locOrientation:

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

dataVlTrnsTmRqs:

type: array

items:

$ref: '#/components/schemas/E2eDataVolTransTimeReq'

minItems: 1

accuReq:

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

pauseFlg:

type: boolean

description: >

Pause analytics consumption flag. Set to "true" to indicate the NWDAF to stop sending

the notifications of analytics. Default value is "false" if omitted.

resumeFlg:

type: boolean

description: >

Resume analytics consumption flag. Set to "true" to indicate the NWDAF to resume sending

the notifications of analytics. Default value is "false" if omitted.

movBehavReqs:

type: array

items:

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

minItems: 1

relProxReqs:

type: array

items:

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

minItems: 1

feedback:

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

required:

- event

not:

required: [excepRequs, exptAnaType]

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

pfdDetermInfos:

type: array

items:

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

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

pduSesTrafInfos:

type: array

items:

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

minItems: 1

dataVlTrnsTmInfos:

type: array

items:

$ref: '#/components/schemas/E2eDataVolTransTimeInfo'

minItems: 1

accuInfo:

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

cancelAccuInd:

type: boolean

description: >

Indicates cancelled subscription of the analytics accuracy information.

Set to "true" indicates the NWDAF cancelled subscription of analytics accuracy

information as the NWDAF does not support the accuracy checking capability.

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

pauseInd:

type: boolean

description: >

Pause analytics consumption indication. Set to "true" to indicate the consumer to stop

the consumption of the analytics. Default value is "false" if omitted.

resumeInd:

type: boolean

description: >

Resume analytics consumption indication. Set to "true" to indicate the consumer to

resume the consumption of the analytics. Default value is "false" if omitted.

movBehavInfos:

type: array

items:

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

minItems: 1

locAccInfos:

type: array

items:

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

minItems: 1

relProxInfos:

type: array

items:

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

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'

pduSesInfo:

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

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.

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

directionInfos:

type: array

items:

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

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: 'TS29522\_AMPolicyAuthorization.yaml#/components/schemas/GeographicalArea'

ratio:

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

confidence:

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

geoDistrInfos:

type: array

items:

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

minItems: 1

distThreshold:

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

required:

- loc

DirectionInfo:

description: Represents the UE direction information.

type: object

properties:

supi:

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

gpsi:

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

numOfUe:

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

avrSpeed:

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

ratio:

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

direction:

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

required:

- direction

oneOf:

- required: [supi]

- required: [gpsi]

GeoDistributionInfo:

description: Represents the geographical distribution of the UEs.

type: object

properties:

loc:

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

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

required:

- loc

oneOf:

- required: [supis]

- required: [gpsis]

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'

fineAreaInfos:

type: array

items:

$ref: 'TS29522\_AMPolicyAuthorization.yaml#/components/schemas/GeographicalArea'

minItems: 1

description: >

This attribute contains the geographical locations in a fine granularity.

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'

minTrafficRate:

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

aggTrafficRate:

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

varTrafficRate:

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

avgPacketDelay:

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

maxPacketDelay:

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

varPacketDelay:

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

avgPacketLossRate:

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

maxPacketLossRate:

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

varPacketLossRate:

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

svcExpLevel:

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

speed:

$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'

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'

rscUsgReq:

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

required:

- nwPerfType

not:

required: [relativeRatio, absoluteNum]

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'

rscUsgReq:

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

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'

minTrafficRate:

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

aggTrafficRate:

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

varTrafficRate:

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

trafRateUeIds:

type: array

items:

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

minItems: 1

avePacketDelay:

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

maxPacketDelay:

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

varPacketDelay:

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

packDelayUeIds:

type: array

items:

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

minItems: 1

avgPacketLossRate:

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

maxPacketLossRate:

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

varPacketLossRate:

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

packLossUeIds:

type: array

items:

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

minItems: 1

numOfUe:

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

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'

avgE2ePktDelayUl:

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

varE2ePktDelayUl:

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

avgE2ePktDelayDl:

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

varE2ePktDelayDl:

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

avgE2ePktLossRateUl:

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

varE2ePktLossRateUl:

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

avgE2ePktLossRateDl:

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

varE2ePktLossRateDl:

$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

wlanPerUeIdInfos:

type: array

items:

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

minItems: 1

description: >

WLAN performance information for UE Id(s) of WLAN access points deployed in the Area

of Interest.

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

WlanPerUeIdPerformanceInfo:

description: The WLAN performance per UE ID.

type: object

properties:

supi:

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

gpsi:

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

wlanPerTsInfos:

type: array

items:

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

minItems: 1

description: >

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

required:

- wlanPerTsInfos

oneOf:

- required: [supi]

- required: [gpsi]

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'

ueLocOrderInd:

type: boolean

description: >

UE Location order indication. Set to "true" to indicate the NWDAF to provide UE

locations in the UE Mobility analytics in time order, otherwise set to "false" or

omitted.

distThresholds:

type: array

items:

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

minItems: 1

description: Indicates the linear distance threshold.

PduSessionInfo:

description: Represents combination of PDU Session parameter(s) information.

type: object

properties:

pduSessType:

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

sscMode:

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

accessTypes:

type: array

items:

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

minItems: 1

PfdDeterminationInfo:

description: Represents the PFD Determination information for a known application identifier.

type: object

properties:

appId:

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

suggPfdInfoList:

type: array

items:

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

minItems: 1

required:

- appId

- suggPfdInfoList

SuggestedPfdInfo:

description: Represents the suggested PFD information for the application identifier.

type: object

properties:

pfdId:

type: string

description: >

Identifier of the PFD (i.e. new PFD ID assigned by NWDAF or existing PFD ID retrieved

from UDR which was generated by NWDAF).

ip3TupleList:

type: array

items:

type: string

minItems: 1

description: >

Represents a 3-tuple with protocol, server ip and server port for UL/DL

application traffic. The content of the string has the same encoding as the IPFilterRule

AVP value as defined in IETF RFC 6733.

urls:

type: array

items:

type: string

minItems: 1

description: Represents the significant parts of the URL to be matched, e.g. host name.

domainNames:

type: array

items:

type: string

minItems: 1

description: Represents Domain name matching criteria.

dnProtocol:

$ref: 'TS29122\_PfdManagement.yaml#/components/schemas/DomainNameProtocol'

pfdConfidence:

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

required:

- pfdId

PduSesTrafficInfo:

description: Represents the PDU Set traffic analytics information.

type: object

properties:

supis:

type: array

items:

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

minItems: 1

dnn:

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

snssai:

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

tdMatchTrafs:

type: array

items:

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

minItems: 1

tdUnmatchTrafs:

type: array

items:

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

minItems: 1

allOf:

- anyOf:

- required: [dnn]

- required: [snssai]

- anyOf:

- required: [tdMatchTrafs]

- required: [tdUnmatchTrafs]

TdTraffic:

description: Represents traffic that matches or unmatches Traffic Descriptor of URSP rule.

type: object

properties:

pduSesTrafReqs:

type: array

items:

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

minItems: 1

ulVol:

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

dlVol:

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

allVol:

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

ulNumOfPkt:

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

dlNumOfPkt:

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

allNumOfPkt:

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

PduSesTrafficReq:

description: Represents the PDU Session traffic analytics requirements.

type: object

properties:

flowDescs:

type: array

items:

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

minItems: 1

description: >

Indicates traffic flow filtering description(s) for IP flow(s).

appId:

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

domainDescs:

type: array

items:

type: string

minItems: 1

description: >

FQDN(s) or a regular expression which are used as a domain name matching criteria.

oneOf:

- required: [flowDescs]

- required: [appId]

- required: [domainDescs]

ResourceUsageRequirement:

description: resource usage requirement.

type: object

properties:

tfcDirc:

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

valExp:

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

E2eDataVolTransTimeReq:

description: Represents other E2E data volume transfer time analytics requirements.

type: object

properties:

criterion:

$ref: '#/components/schemas/E2eDataVolTransTimeCriterion'

order:

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

highTransTmThr:

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

lowTransTmThr:

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

repeatDataTrans:

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

tsIntervalDataTrans:

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

dataVolume:

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

maxNumberUes:

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

oneOf:

- required: [repeatDataTrans]

- required: [tsIntervalDataTrans]

DataVolume:

description: Data Volume including UL/DL.

type: object

properties:

uplinkVolume:

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

downlinkVolume:

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

anyOf:

- required: [uplinkVolume]

- required: [downlinkVolume]

E2eDataVolTransTimeInfo:

description: >

Represents the E2E data volume transfer time analytics information when subscribed event is

"E2E\_DATA\_VOL\_TRANS\_TIME", the "dataVlTrnsTmInfos" attribute shall be included.

type: object

properties:

e2eDataVolTransTimes:

type: array

items:

$ref: '#/components/schemas/E2eDataVolTransTimePerTS'

minItems: 1

e2eDataVolTransTimeUeLists:

type: array

items:

$ref: '#/components/schemas/E2eDataVolTransTimeUeList'

minItems: 1

geoDistrInfos:

type: array

items:

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

minItems: 1

confidence:

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

required:

- e2eDataVolTransTimes

E2eDataVolTransTimePerTS:

description: Represents the E2E data volume transfer time analytics per Time Slot.

type: object

properties:

tsStart:

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

tsDuration:

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

e2eDataVolTransTimePerUe:

type: array

items:

$ref: '#/components/schemas/E2eDataVolTransTimePerUe'

minItems: 1

required:

- tsStart

- tsDuration

- e2eDataVolTransTimePerUe

E2eDataVolTransTimePerUe:

description: Represents the E2E data volume transfer time per UE.

type: object

properties:

supi:

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

gpsi:

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

snssai:

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

accessType:

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

ratTypes:

type: array

items:

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

minItems: 1

description: The RAT types.

appId:

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

ueLoc:

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

dnn:

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

spatialValidity:

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

validityPeriod:

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

dataVolTransTime:

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

oneOf:

- required: [ueLoc]

- required: [snssai]

E2eDataVolTransTimeUeList:

description: >

Contains the list of UEs classified based on experience level of E2E Data Volume Transfer

Time

type: object

properties:

highLevel:

type: array

items:

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

minItems: 1

mediumLevel:

type: array

items:

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

minItems: 1

lowLevel:

type: array

items:

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

minItems: 1

lowRatio:

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

mediumRatio:

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

highRatio:

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

spatialValidity:

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

validityPeriod:

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

anyOf:

- required: [highLevel]

- required: [mediumLevel]

- required: [lowLevel]

DataVolumeTransferTime:

description: >

Indicates the E2E data volume transfer time and the data volume used to derive the transfer

time.

type: object

properties:

uplinkVolume:

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

avgTransTimeUl:

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

varTransTimeUl:

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

downlinkVolume:

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

avgTransTimeDl:

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

varTransTimeDl:

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

GeoLocation:

description: >

Represents a horizontal and optionally vertical location using either geographic

or local coordinates.

type: object

properties:

point:

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

pointAlt:

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

refPoint:

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

localCoords:

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

anyOf:

- required: [point]

- required: [pointAlt]

- allOf:

- required: [refPoint]

- required: [localCoords]

LocAccuracyReq:

description: >

Contains location accuracy analytics requirements.

type: object

properties:

accThres:

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

accThresMatchDir:

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

inOutThres:

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

inOutThresMatchDir:

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

posMethod:

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

LocAccuracyInfo:

description: >

Contains location accuracy analytics.

type: object

properties:

locAccPerMeths:

type: array

items:

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

minItems: 1

description: Location accuracy information per positioning method.

inOutUePct:

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

inOutInd:

type: boolean

description: Indicates if the target location is indoors or outdoors.

confidence:

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

required:

- locAccPerMeths

not:

required: [inOutUePct, inOutInd]

LocAccuracyPerMethod:

description: >

Contains location accuracy analytics per positioning method.

type: object

properties:

posMethod:

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

locAcc:

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

losNlosPct:

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

losNlosInd:

type: boolean

description: Indicates whether the target location is measured with LOS or NLOS.

required:

- posMethod

- locAcc

AccuracyReq:

description: Represents the analytics accuracy requirement information.

type: object

properties:

accuTimeWin:

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

accuPeriod:

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

accuDevThr:

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

minNum:

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

updatedAnaFlg:

type: boolean

description: >

Indicates the updated Analytics flag. Set to "true" indicates that the NWDAF can provide

the updated analytics if the analytics can be generated within the analytics accuracy

information time window, which is specified by "accuTimeWin" attribute.

Otherwise set to “false”. Default value is “false” if omitted.

correctionInterval:

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

AccuracyInfo:

description: The analytics accuracy information.

type: object

properties:

accuracyVal:

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

accuSampleNbr:

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

anaAccuInd:

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

required:

- accuracyVal

MovBehavReq:

description: Represents the Movement Behaviour analytics requirements.

type: object

properties:

locationGranReq:

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

reportThresholds:

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

MovBehavInfo:

description: Represents the Movement Behaviour information.

type: object

properties:

geoLoc:

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

movBehavs:

type: array

items:

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

minItems: 1

confidence:

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

MovBehav:

description: Represents the Movement Behaviour information per time slot.

type: object

properties:

tsStart:

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

tsDuration:

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

numOfUe:

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

ratio:

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

avrSpeed:

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

speedThresdInfos:

type: array

items:

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

minItems: 1

directionUeInfos:

type: array

items:

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

minItems: 1

required:

- tsStart

- tsDuration

SpeedThresholdInfo:

description: UEs information whose speed is faster than the speed threshold.

type: object

properties:

speedThr:

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

numOfUe:

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

ratio:

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

RelProxReq:

description: Represents the Relative Proximity analytics requirements.

type: object

properties:

direction:

type: array

items:

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

minItems: 1

numOfUe:

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

proximityCrits:

type: array

items:

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

minItems: 1

RelProxInfo:

description: Represents the Relative Proximity information.

type: object

properties:

tsStart:

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

tsDuration:

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

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

ueProximities:

type: array

items:

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

minItems: 1

ttcInfo:

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

required:

- tsStart

- tsDuration

- ueProximities

UeProximity:

description: Represents the Observed or Predicted proximity information.

type: object

properties:

ueDistance:

type: integer

ueVelocity:

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

avrSpeed:

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

locOrientation:

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

ueTrajectories:

type: array

items:

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

minItems: 1

ratio:

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

UeTrajectory:

description: Represents timestamped UE positions.

type: object

properties:

supi:

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

gpsi:

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

timestampedLocs:

type: array

items:

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

minItems: 1

required:

- timestampedLocs

oneOf:

- required: [supi]

- required: [gpsi]

TimestampedLocation:

description: The timestamped locations of the trajectory of the UE.

type: object

properties:

ts:

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

locInfo:

items:

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

required:

- ts

- locInfo

TimeToCollisionInfo:

description: Represents Time To Collision (TTC) information.

type: object

properties:

ttc:

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

accuracy:

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

confidence:

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

collisionSpace:

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

colSpcConfidence:

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

# Editor’s Note: The collision direction in above data type is not specified FFS depends on SA2.

AnalyticsFeedbackInfo:

description: Analytics feedback information.

type: object

properties:

actionTimes:

type: array

items:

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

minItems: 1

description: The times at which an action was taken.

usedAnaTypes:

type: array

items:

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

minItems: 1

description: The analytics types that were used to take the action.

impactInd:

type: boolean

description: Indication about the impact of an action on the ground truth data.

required:

- actionTimes

RoamingInfo:

description: Information related to roaming analytics.

type: object

properties:

plmnId:

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

aois:

type: array

items:

$ref: 'TS29522\_AMPolicyAuthorization.yaml#/components/schemas/GeographicalArea'

minItems: 1

description: Areas of Interest in the HPLMN or the VPLMN.

servingNfIds:

type: array

items:

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

minItems: 1

description: NF ID(s) of the NF(s) serving the roaming UE(s) in the VPLMN.

servingNfSetIds:

type: array

items:

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

minItems: 1

description: NF Set ID(s) of the NF Set(s) serving the roaming UE(s) in the VPLMN.

#

# 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

- PFD\_DETERMINATION

- PDU\_SESSION\_TRAFFIC

- E2E\_DATA\_VOL\_TRANS\_TIME

- MOVEMENT\_BEHAVIOUR

- NUM\_OF\_UE

- MOV\_UE\_RATIO

- AVR\_SPEED

- SPEED\_THRESHOLD

- MOV\_UE\_DIRECTION

- LOC\_ACCURACY

- RELATIVE\_PROXIMITY

- 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.

- PFD\_DETERMINATION: Indicates that the event subscribed is the PFD Determination nformation

for known application identifier(s).

- PDU\_SESSION\_TRAFFIC: Indicates that the event subscribed is the PDU Session traffic

information.

- E2E\_DATA\_VOL\_TRANS\_TIME: Indicates that the event subscribed is of E2E data volume

transfer time.

- MOVEMENT\_BEHAVIOUR: Indicates that the event subscribed is the Movement Behaviour

information.

- LOC\_ACCURACY: Indicates that the event subscribed is of location accuracy.

- RELATIVE\_PROXIMITY: Indicates that the event subscribed is the Relative Proximity

information.

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

- GNB\_RSC\_USAGE\_OVERALL\_TRAFFIC

- GNB\_RSC\_USAGE\_GBR\_TRAFFIC

- GNB\_RSC\_USAGE\_DELAY\_CRIT\_GBR\_TRAFFIC

- 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.

- GNB\_RSC\_USAGE\_OVERALL\_TRAFFIC: The gNB resource usage.

- GNB\_RSC\_USAGE\_GBR\_TRAFFIC: The gNB resource usage for GBR traffic.

- GNB\_RSC\_USAGE\_DELAY\_CRIT\_GBR\_TRAFFIC: The gNB resource usage for Delay-critical GBR

traffic.

- 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

- PREDICTION\_NOT\_ALLOWED

- UNSATISFIED\_REQUESTED\_ANALYTICS\_TIME

- NO\_ROAMING\_SUPPORT

- 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.

- PREDICTION\_NOT\_ALLOWED: Indicates that the request for the prediction of the analytics

event is not allowed.

- 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.

- NO\_ROAMING\_SUPPORT: Indicates that the request shall be rejected because roaming analytics

or data are required and the NWDAF neither supports roaming exchange capabilitiy nor can

it forward the request to another NWDAF.

- 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

- AGG\_TRAFFIC\_RATE

- VAR\_TRAFFIC\_RATE

- AVG\_PACKET\_DELAY

- MAX\_PACKET\_DELAY

- VAR\_PACKET\_DELAY

- AVG\_PACKET\_LOSS\_RATE

- MAX\_PACKET\_LOSS\_RATE

- VAR\_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

- TRAFFIC\_MATCH\_TD

- TRAFFIC\_UNMATCH\_TD

- NUMBER\_OF\_UE

- UE\_GEOG\_DIST

- UE\_DIRECTION

- AVG\_E2E\_UL\_PKT\_DELAY

- VAR\_E2E\_UL\_PKT\_DELAY

- AVG\_E2E\_DL\_PKT\_DELAY

- VAR\_E2E\_DL\_PKT\_DELAY

- AVG\_E2E\_UL\_PKT\_LOSS\_RATE

- VAR\_E2E\_UL\_PKT\_LOSS\_RATE

- AVG\_E2E\_DL\_PKT\_LOSS\_RATE

- VAR\_E2E\_DL\_PKT\_LOSS\_RATE

- E2E\_DATA\_VOL\_TRANS\_TIME\_FOR\_UE\_LIST

- IN\_OUT\_PERCENT

- TIME\_TO\_COLLISION

- 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.

- AGG\_TRAFFIC\_RATE: Indicates aggregated traffic rate. This value is only applicable to

DN\_PERFORMANCE event.

- VAR\_TRAFFIC\_RATE: Indicates variance 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.

- VAR\_PACKET\_DELAY: Indicates variance 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.

- MAX\_PACKET\_LOSS\_RATE: Indicates maximum Packet Loss Rate. This value is only applicable to

DN\_PERFORMANCE event.

- VAR\_PACKET\_LOSS\_RATE: Indicates variance Packet 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.

- TRAFFIC\_MATCH\_TD: Identifies traffic that matches Traffic Descriptor provided by

the consumer.

- TRAFFIC\_UNMATCH\_TD: Identifies traffic that does not match Traffic Descriptor

provided by the consumer.

- NUMBER\_OF\_UE: Indicates the number of UEs. This value is only applicable to

DN\_PERFORMANCE event.

- UE\_GEOG\_DIST: Indicates the geographical distribution of the UEs that can be selected by

the AF for application service. This value is only applicable to UE\_MOBILITY event.

- UE\_DIRECTION: Indicates the direction of the UEs. This value is only applicable to

UE\_MOBILITY event.

- AVG\_E2E\_UL\_PKT\_DELAY: Indicates average End-to-End (between UE and UPF) uplink packet

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

- VAR\_E2E\_UL\_PKT\_DELAY: Indicates the variance of End-to-End (between UE and UPF) uplink

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

- AVG\_E2E\_DL\_PKT\_DELAY: Indicates average End-to-End (between UE and UPF) downlink packet

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

- VAR\_E2E\_DL\_PKT\_DELAY: Indicates the variance of End-to-End (between UE and UPF) downlink

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

- AVG\_E2E\_UL\_PKT\_LOSS\_RATE: Indicates average End-to-End (between UE and UPF) uplink packet

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

- VAR\_E2E\_UL\_PKT\_LOSS\_RATE: Indicates the variance of End-to-End (between UE and UPF) uplink

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

- AVG\_E2E\_DL\_PKT\_LOSS\_RATE: Indicates average End-to-End (between UE and UPF) downlink

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

- VAR\_E2E\_DL\_PKT\_LOSS\_RATE: Indicates the variance of End-to-End (between UE and UPF)

downlink packet loss rate. This value is only applicable to RED\_TRANS\_EXP event.

- E2E\_DATA\_VOL\_TRANS\_TIME\_FOR\_UE\_LIST: Indicates the classified E2E data volume transfer

time statistics or predictions for multiple UEs with respect to one or more reporting

thresholds.

- NUM\_OF\_UE: Indicates the total number of users in the area of interest. This

value is only applicable to MOVEMENT\_BEHAVIOUR event.

- MOV\_UE\_RATIO: Indicates the Ratio of moving UEs in the area of interest. This value

is only applicable to MOVEMENT\_BEHAVIOUR event.

- AVR\_SPEED: Indicates the average speed of all UEs in the area of interest. This value

is only applicable to MOVEMENT\_BEHAVIOUR event.

- SPEED\_THRESHOLD: Indicates the information on UEs in the area of interest whose speed

is faster than the speed threshold. This value is only applicable to MOVEMENT\_BEHAVIOUR

event.

- MOV\_UE\_DIRECTION: Indicates the heading directions of the UE flow in the target area.

This value is only applicable to MOVEMENT\_BEHAVIOUR event.

- IN\_OUT\_PERCENT: Indicates the percentage of indoor/outdoor UEs at a location.

The value is only applicable to the LOC\_ACCURACY event.

- TIME\_TO\_COLLISION: Indicates the time until for a collision with another UE happens.

This value is only applicable to RELATIVE\_PROXIMITY event prediction.

DispersionType:

anyOf:

- 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:

anyOf:

- 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: |

Represents the device type.

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: |

Represents the cause for requesting to terminate an analytics subscription.

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: |

Represents the ordering criterion for the list of UE mobility analytics.

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: |

Represents the ordering criterion for the list of UE communication analytics.

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: |

Represents the ordering criterion for the list of network performance analytics.

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.

LocInfoGranularity:

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: |

Represents the preferred granularity of location information.

Possible values are:

- 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.

TrafficDirection:

anyOf:

- type: string

enum:

- UL\_AND\_DL

- UL

- DL

- 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 traffic direction for the resource usage information.

Possible values are:

- UL\_AND\_DL: Uplink and downlink traffic.

- UL: Uplink traffic.

- DL: Downlink traffic.

ValueExpression:

anyOf:

- type: string

enum:

- AVERAGE

- PEAK

- 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 average or peak value of the resource usage for the network performance type.

Possible values are:

- AVERAGE: Resource usage information in average value.

- PEAK: Resource usage information in peak value.

E2eDataVolTransTimeCriterion:

anyOf:

- type: string

enum:

- E2E\_DATA\_VOL\_TRANS\_TIME

- type: string

description: >

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

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

description: |

Represents the ordering criterion for the list of E2E data volume transfer time.

Possible values are:

- E2E\_DATA\_VOL\_TRANS\_TIME: The ordering criterion is the E2E data volume transfer time.

AnalyticsAccuracyIndication:

anyOf:

- type: string

enum:

- MEET

- NOT\_MEET

- 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:

- MEET: Indicates meet the analytics accuracy requirement.

- NOT\_MEET: Indicates not meet the analytics accuracy requirement.

LocationOrientation:

anyOf:

- type: string

enum:

- HORIZONTAL

- VERTICAL

- HOR\_AND\_VER

- 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:

- HORIZONTAL: Indicates horizontal orientation.

- VERTICAL: Indicates vertical orientation.

- HOR\_AND\_VER: Indicates both horizontal and vertical orientation.

Direction:

anyOf:

- type: string

enum:

- NORTH

- SOUTH

- EAST

- WEST

- NORTHWEST

- NORTHEAST

- SOUTHWEST

- SOUTHEAST

- 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:

- NORTH: North direction.

- SOUTH: South direction.

- EAST: EAST direction.

- WEST: WEST direction.

- NORTHWEST: Northwest direction.

- NORTHEAST: Northeast direction.

- SOUTHWEST: Southwest direction.

- SOUTHEAST: Southeast direction.

ProximityCriterion:

anyOf:

- type: string

enum:

- VELOCITY

- AVG\_SPD

- ORIENTATION

- TRAJECTORY

- 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:

- VELOCITY: Velocity.

- AVG\_SPD: Average speed.

- ORIENTATION: Orientation.

- TRAJECTORY: Mobility trajectory.

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