**3GPP TSG-CT WG3 Meeting #128 *C3-232217***

**Bratislava, Slovakia, 22nd - 26th May, 2023 (revision of C3-232abc)**

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| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.520** | **CR** | **0726** | **rev** |  | **Current version:** | **18.1.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Support of analytics subset and accuracy per analytics subset for UE mobility for Nnwdaf\_EventsSubscription API |
|  |  |
| ***Source to WG:*** | Huawei, KDDI |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | eNA\_Ph3 |  | ***Date:*** | 2023-05-04 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | As indicated in , the analytics subsets and preferred level of accuracy per analytics subset may be provided by the consumer in the request. This paper proposes to support these requirements in stage 3.There are some inconsistesnt descriptions in subscription operation for UE Mobility analytics. |
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| ***Summary of change:*** | This CR proposes to* Add the list of analytics subsets to the operation clause.
* Correct the LADN DNN and Visited Area(s) of Interest as optional operations.
* Move the operation of UE mobility analytics requirements from UE communication analytics.
* Update the description of "accPerSubset" attribute to support accuracy per analytics subset for UE mobility analytics.
* Define the new analytics subsets for geographical distribution, direction of UEs and user location.
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| ***Consequences if not approved:*** | The analytics subset and accuracy per analytics subset for UE mobility is not supported. |
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| ***Clauses affected:*** | 4.2.2.2.2, 5.1.6.2.7, 5.1.6.3.18, A.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS/TR 23.288 CR 0817 |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | The CR introduces backward compatible feature to the OpenAPI file for Nnwdaf\_EventsSubscription API. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

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

##### 4.2.2.2.2 Subscription for event notifications

Figure 4.2.2.2.2-1 shows a scenario where the NF service consumer sends a request to the NWDAF to subscribe for event notification(s) (as shown in 3GPP TS 23.288 [17]).



Figure 4.2.2.2.2-1: NF service consumer subscribes to notifications

The NF service consumer shall invoke the Nnwdaf\_EventsSubscription\_Subscribe service operation to subscribe to event notification(s). The NF service consumer shall send an HTTP POST request with "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions" as Resource URI representing the "NWDAF Events Subscriptions", as shown in figure 4.2.2.2.2-1, step 1, to create a subscription for an "Individual NWDAF Event Subscription" according to the information in message body. The NnwdafEventsSubscription data structure provided in the request body shall include:

- an URI where to receive the requested notifications as "notificationURI" attribute; and

- a description of the subscribed events as "eventSubscriptions" attribute that, for each event, the EventSubscription data type shall include:

1) an event identifier as "event" attribute; and

2) if the event notification method "PERIODIC" is selected via the "notificationMethod" attribute, repetition period as "repetitionPeriod" attribute;

- and may include:

1) maximum number of objects in the "maxObjectNbr" attribute;

2) maximum number of SUPIs expected for an analytics report in the "maxSupiNbr" attribute;

3) identification of time window to which the subscription applies via identification of date-time(s) in the "startTs" and "endTs" attributes;

4) preferred level of accuracy of the analytics in the "accuracy" attribute;

5) identification of time when analytics information is needed in the "timeAnaNeeded" atribute if the feature "EneNA" is supported;

6) indication of which analytics metadata is requested to be delivered with the notification in the "anaMeta" attribute if the feature "Aggregation" is supported;

7) requested values for analytics metadata information to be used for the generation of the analytics in the "anaMetaInd" attribute if the feature "Aggregation" is supported;

8) offset period to the periodic reporting in the "offsetPeriod" attribute if the feature "EneNA" is supported. It may be present if the "repPeriod" attribute within the "evtReq" attribute or the "repetitionPeriod" attribute within the EventSubscription data type is included;

9) preferred accuracy level per analytics subset in the "accPerSubset" attribute if the "listOfAnaSubsets" attribute is present and the "EneNA" feature is supported; and/or

10) the time period of historical analytics in the "histAnaTimePeriod" attribute, if the "EneNA" feature is supported.

The NnwdafEventsSubscription data structure provided in the request body may include:

- event reporting information as the "evtReq" attribute, which applies for each event and may contain the following attributes:

1) event notification method (periodic, one time, on event detection) in the "notifMethod" attribute;

2) maximum Number of Reports in the "maxReportNbr" attribute;

3) monitoring duration in the "monDur" attribute;

4) repetition period for periodic reporting in the "repPeriod" attribute;

5) immediate reporting indication in the "immRep" attribute;

6) percentage of sampling among impacted UEs in the "sampRatio" attribute;

7) partitioning criteria for partitioning the impacted UEs before performing sampling as "partitionCriteria" attribute if the "EneNA" feature is supported;

8) group reporting guard time for aggregating the reports for a group of UEs in the "grpRepTime" attribute; and/or

9) a notification flag (used for muting and retrieving notifications) as "notifFlag" attribute if the "EneNA" feature is supported;

NOTE 1: The notification method indicated as the "notifMethod" attribute and the periodic reporting time indicated as the "repPeriod" attributes within the event reporting information as the "evtReq" attribute provided in NnwdafEventsSubscription data type, if present, supersedes the event notification method as the "notificationMethod" attribute and repetition period as the "repetitionPeriod" attribute respectively in the EventSubscription data type.

- information of previous analytics subscription in the "prevSub" attribute if the "AnaCtxTransfer" feature is supported;

- the notification correlation identifier in the "notifCorrId" attribute, if the "EneNA" feature is supported; and/or

- analytics consumer information as "consNfInfo" attribute, if the "AnaSubTransfer" feature is supported.

NOTE 2: The "consNfInfo" attribute enables the NWDAF to determine whether an analytics subscription transfer procedure is applicable. Otherwise, if the "consNfInfo" attribute is not provided in a subscription and the NWDAF cannot serve anymore or transfer this subscription, the NWDAF can notify the analytics consumer with a Termination Request so that the analytics consumer can select a new target NWDAF.

For different event types, the "eventSubscriptions" attribute:

- if the event is "SLICE\_LOAD\_LEVEL", shall provide:

1) network slice level load level threshold in the "loadLevelThreshold" attribute if the "notifMethod" attribute in "evtReq" attribute is set to "ON\_EVENT\_DETECTION" or the "notificationMethod" attribute in "eventSubscriptions" attribute is set to "THRESHOLD" or omitted; and

2) identification of network slice(s) to which the subscription applies via identification of network slice(s) in the "snssais" attribute or any slices indication in the "anySlice" attribute;

- if the feature "NsiLoad" is supported and the event is "NSI\_LOAD\_LEVEL", shall provide:

1) identification of network slice and the optionally associated network slice instance(s) if available, via the "nsiIdInfos" attribute or any slices indication in the "anySlice" attribute; and

NOTE 3: The network slice instance of a PDU session is not available in the PCF.

2) the network slice or network slice instance load level thresholds in the "nsiLevelThrds" attribute if the "notifMethod" attribute in "evtReq" attribute is set to "ON\_EVENT\_DETECTION" or the "notificationMethod" attribute in "eventSubscriptions" attribute is set to "THRESHOLD" or omitted;

 and may include:

1) a list of analytics subsets carried by "listOfAnaSubsets" attribute with value(s) only applicable to "NSI\_LOAD\_LEVEL" event, if the "EneNA" feature is supported;

2) identification of network area to which the subscription applies via identification of network area(s) by "networkArea" attribute, if the "NsiLoadExt" feature is supported; and/or

3) a matching direction in the "matchingDir" attribute if the "nsiLevelThrds" attribute is provided and the "NsiLoadExt" feature is supported.

- if the feature "NfLoad" is supported and the event is "NF\_LOAD", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis" or "anyUe" in the "tgtUe" attribute; and

NOTE 4: Only NF instances of type AMF and SMF which are serving the UE can be determined using a SUPI in "supis" attribute.

NOTE 5: If a list of the NF Instance IDs (or respectively of NF Set IDs) is provided, the NWDAF needs to provide the analytics for each designated NF instance (or respectively for each NF instance belonging to each designated NF Set). In such case the target UE(s) of the Analytics Reporting need be ignored.

2) NF load level thresholds in the "nfLoadLvlThds" attribute if the "notifMethod" attribute in "evtReq" attribute is set to "ON\_EVENT\_DETECTION" or the "notificationMethod" attribute in "eventSubscriptions" attribute is set to "THRESHOLD" or omitted;

- and may include:

1) either list of NF instance IDs in the "nfInstanceIds" attribute or list of NF set IDs in the "nfSetIds" attribute if the identification of target UE(s) applies to all UEs;

2) list of NF instance types in the "nfTypes" attribute;

3) identification of network slice(s) by "snssais" attribute;

4) a matching direction in the "matchingDir" attribute if the "nfLoadLvlThds" attribute is provided;

5) optional area of interest by "networkArea" attribute, if the "NfLoadExt" feature is supported; and/or

6) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to NF\_LOAD event, if the "EneNA" feature is supported;

- if the feature "NetworkPerformance" is supported and the event is "NETWORK\_PERFORMANCE", it shall provide:

1) identification of target UE(s) to which the subscription applies by "supis", "intGroupIds" or "anyUe" attribute in the "tgtUe" attribute; and

2) the network performance requirements via "nwPerfRequs" attribute;

 and may provide:

1) identification of network area to which the subscription applies via identification of network area(s) by "networkArea" attribute (mandatory if "anyUe" attribute is set to true); and/or

2) a matching direction in the "matchingDir" attribute if the "nwPerfRequs" attribute is provided.

- if the feature "ServiceExperience" is supported and the event is "SERVICE\_EXPERIENCE", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis", "intGroupIds" or "anyUe" attribute in the "tgtUe" attribute; and

2) any slices indication in the "anySlice" attribute or identification of network slice(s) together with the optionally associated network slice instance(s) if available, via the "nsiIdInfos" attribute;

NOTE 6: The network slice instance of a PDU session is not available in the PCF.

- and may provide:

1) identification of application to which the subscription applies via identification of application(s) by "appIds" attribute;

2) identification of network area to which the subscription applies via identification of network area(s) by "networkArea" attribute (mandatory if "anyUe" attribute is set to true);

3) identification of DNN to which the subscription applies via identification of application(s) by "dnns" attribute;

4) identification of user plane access to DN(s) which the subscription applies as the "dnais" attribute;

5) identification of a user plane access to one or more DN(s) where applications are deployed by "dnais" attribute;

6) if "appIds" attribute is provided, the bandwidth requirement of each application by "bwRequs" attribute;

7) indication of all the RAT types and/or all the frequencies that the NWDAF received for the application or specific RAT type(s) and/or frequency(ies) and the service experience threshold value(s) for the RAT Type(s) and/or Frequency value(s) where the UE camps on by "ratFreqs" attribute if the feature "ServiceExperienceExt" is also supported; and/or

8) a list of analytics subsets carried by "listOfAnaSubsets" attribute with value(s) only applicable to "SERVICE\_EXPERIENCE" event, if the "EneNA" feature is supported;

9) the identification of the UPF as the "upfInfo" attribute if the feature "ServiceExperienceExt" is also supported; and/or

10) IP address(s)/FQDN(s) of the Application Server(s) as the "appServerAddrs" attribute if the feature "ServiceExperienceExt" is also supported;

- if the feature "UeMobility" is supported and the event is "UE\_MOBILITY", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis" or "intGroupIds" attribute in the "tgtUe" attribute;

NOTE 7: For LADN service, the consumer (e.g. SMF) provides the LADN DNN to refer the LADN service area as the AOI.

- and may provide:

1) identification of network area to which the subscription applies via identification of network area(s) by "networkArea" attribute;

3

4) an optional list of analytics subsets carried by "listOfAnaSubsets" attribute with value(s) only applicable to "UE\_MOBILITY" event, if the "UeMobilityExt2\_eNA" and "EneNA" features are supported;

- if the feature "UeCommunication" is supported and the event is "UE\_COMM", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis" or "intGroupIds" attribute in the "tgtUe" attribute;

- and may provide:

1) identification of the application in the "appIds" attribute;

2) identification of network area to which the subscription applies via identification of network area(s) by "networkArea" attribute;

3) an identification of DNN in the "dnns" attribute;

4) identification of network slice in the "snssais" attribute; and/or

5) a list of analytics subsets carried by "listOfAnaSubsets" attribute with value(s) only applicable to "UE\_COMM" event, if the "EneNA" feature is supported;

6) other UE communication analytics requirements in "ueCommReqs" attribute, which may include ordering criterion and ordering direction, if the "EnUeCommunication" feature is supported;

- if the feature "QoSSustainability" is supported and the event is "QOS\_SUSTAINABILITY", shall provide:

1) identification of network area to which the subscription applies via identification of network area by "networkArea" attribute;

2) the QoS requirements via "qosRequ" attribute;

3) QoS flow retainability threshold(s) by the "qosFlowRetThds" attribute for the 5QI of GBR resource type or RAN UE throughout threshold(s) by the "ranUeThrouThds" attribute for the 5QI of non-GBR resource type, if the "notifMethod" attribute in "evtReq" attribute is set to "ON\_EVENT\_DETECTION" or the "notificationMethod" attribute in "eventSubscriptions" attribute is set to "THRESHOLD" or omitted; and

4) identification of target UE(s) to which the subscription applies by "anyUe" in the "tgtUe" attribute;

- and may include:

1) identification of network slice(s) by "snssais" attribute;

2) a matching direction in the "matchingDir" attribute if the "qosFlowRetThds" attribute or the "ranUeThrouThds" attribute is provided; and/or

3) acceptable deviations from the threshold levels in the "deviations" attribute, if the "EnQoSSustainability" feature is supported.

- if the feature "AbnormalBehaviour" is supported and the event is "ABNORMAL\_BEHAVIOUR", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis", "intGroupIds" or "anyUe" attribute in the "tgtUe" attribute; and

2) either the expected analytics type via "exptAnaType" attribute or a list of exception Ids with the associated thresholds via "excepRequs" attribute. If the expected analytics type via "exptAnaType" attribute is provided, the NWDAF shall derive the corresponding Exception Ids from the received expected analytics type as follows:

a) if "exptAnaType" attribute sets to "MOBILITY", the corresponding list of Exception Ids are "UNEXPECTED\_UE\_LOCATION", "PING\_PONG\_ACROSS\_CELLS", "UNEXPECTED\_WAKEUP" and "UNEXPECTED\_RADIO\_LINK\_FAILURES";

b) if "exptAnaType" attribute sets to "COMMUN", the corresponding list of Exception Ids are "UNEXPECTED\_LONG\_LIVE\_FLOW", "UNEXPECTED\_LARGE\_RATE\_FLOW", "SUSPICION\_OF\_DDOS\_ATTACK", "WRONG\_DESTINATION\_ADDRESS" and "TOO\_FREQUENT\_SERVICE\_ACCESS"; and

c) if "exptAnaType" attribute sets to "MOBILITY\_AND\_COMMUN", the corresponding list of Exception Ids includes all above derived exception Ids.

 The derived list of Exception Ids is used by the NWDAF to notify the NF service consumer when UE's behaviour is exceptional based on one or more Exception Ids within the list.

 If the "anyUe" attribute in the "tgtUe" attribute sets to "true":

a) the expected analytics type via the"exptAnaType" attribute or the list of Exception Ids via "excepRequs" attribute shall not be requested for both mobility and communication related analytics at the same time;

b) if the expected analytics type via the"exptAnaType" attribute or the list of Exception Ids via "excepRequs" attribute is mobility related, at least one of identification of network area(s) by "networkArea" attribute and identification of network slice(s) by "snssais" attribute should be provided; and

c) if the expected analytics type via the"exptAnaType" attribute or the list of Exception Ids via "excepRequs" attribute is communication related, at least one of identification of network area(s) by "networkArea" attribute, identification of application(s) by "appIds" attribute, identification of DNN(s) in the "dnns" attribute and identification of network slice(s) by "snssais" attribute should be provided;

- and may provide:

1) expected UE behaviour via "exptUeBehav" attribute; and

- if the feature "UserDataCongestion" is supported and the event is "USER\_DATA\_CONGESTION", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis", "gpsis" (if feature "UserDataCongestionExt" is supported) or "anyUe" attribute;

- and may include:

1) congestion threshold by the "congThresholds" attribute if the "notifMethod" attribute in "evtReq" attribute is set to "ON\_EVENT\_DETECTION" or the "notificationMethod" attribute in "eventSubscriptions" attribute is set to "THRESHOLD" or omitted;

2) identification of network area to which the subscription applies via identification of network area(s) by "networkArea" attribute (mandatory if "anyUe" attribute is set to true);

3) identification of network slice(s) by "snssais" attribute;

4) a matching direction in the "matchingDir" attribute if the "congThresholds" attribute is provided;

5) if the feature "UserDataCongestionExt" is also supported, request a list of top applications with maximum number that contribute the most to the traffic in uplink and/or downlink directions by the "maxTopAppUlNbr" attribute and/or the "maxTopAppDlNbr" attribute;

6) a list of analytics subsets carried by "listOfAnaSubsets" attribute with value(s) only applicable to "USER\_DATA\_CONGESTION" event, if the "EneNA" feature is supported; and/or

7) the ordering criterion for the list of User Data Congestion analytics in "userDataConOrderCri" attribute, if the "UserDataCongestionExt2\_eNA" feature is supported;

- if the feature "Dispersion" is supported and the event is "DISPERSION", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis", "intGroupIds" or "anyUe" attribute in the "tgtUe" attribute, "anyUe" attribute is only supported in combination with "snssais" attribute, "networkArea" attribute and/or "disperClass" attribute;- and may include:

1) identification of network area to which the subscription applies via identification of network area by "networkArea" attribute, if the "supis" attribute or "intGroupIds" attribute is included in the "tgtUe" attribute;

2) identification of network slice(s) by "snssais" attribute;

3) application identifier(s) in "appIds" attribute;

4) dispersion analytics requirements in "disperReqs" attribute, which for the requested dispersion type may include dispersion class, preferred ordering requirements; and/or

5) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to DISPERSION event, if the "EneNA" feature is supported;

- if the feature "RedundantTransmissionExp" is supported and the event is "RED\_TRANS\_EXP", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis", "intGroupIds" or "anyUe" attribute in the "tgtUe" attribute;- and may include:

1) identification of network area to which the subscription applies via identification of network area by "networkArea" attribute;

2) identification of network slice(s) by "snssais" attribute;

3) identification of DNN in the "dnns" attribute;

4) other redundant transmission experience analysis requirements in "redTransReqs" attribute, which may include preferred order of results for the list of Redundant Transmission Experience; and/or

5) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to RED\_TRANS\_EXP event, if the "EneNA" feature is supported;

- if the feature "WlanPerformance" is supported and the event is "WLAN\_PERFORMANCE", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis", "intGroupIds" or "anyUe" attribute in the "tgtUe" attribute. If "anyUe" attribute is included in the "tgtUe" attribute, then any of "networkArea" attribute, "ssIds" or "bssIds" attribute within "wlanReqs" attribute shall be present;

- and may include:

1) identification of network area to which the subscription applies via identification of network area by "networkArea" attribute;

2) other WLAN performance analytics requirements in "wlanReqs" attribute, which may include SSID(s), BSSID(s), preferred order of results for the list of WLAN performance information and/or accuracy per analytics subset; and/or

3) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to WLAN\_PERFORMANCE event, if the "EneNA" feature is supported;

- if the feature "DnPerformance" is supported and the event is "DN\_PERFORMANCE", shall provide:

1) identification of target UE(s) to which the subscription applies by "supis", "intGroupIds" or "anyUe" attribute in the "tgtUe" attribute;

- and may include:

1) identification of network area to which the subscription applies via identification of network area by "networkArea" attribute;

2) identification of network slice(s) in the "snssais" attribute;

3) identification of network slice and the optionally associated network slice instance(s) if available, via the "nsiIdInfos" attribute or any slices indication in the "anySlice" attribute;

4) application identifier(s) in "appIds" attribute;

5) an identification of DNN in the "dnns" attribute;

6) identification of a user plane access to one or more DN(s) where applications are deployed by "dnais" attribute;

7) the identification of the UPF as the "upfInfo" attribute;

8) IP address(s)/FQDN(s) of the Application Server(s) as the "appServerAddrs" attribute;

9) other DN performance analytics requirements in "dnPerfReqs" attribute, which may include the preferred order of results for the list of DN performance information and/or the reporting threshold of each analytics subset; and/or

10) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to "DN\_PERFORMANCE" event, if the "EneNA" feature is supported;

- if the feature "SMCCE" is supported and the event is "SM\_CONGESTION", shall provide:

1) an identification of DNN in the "dnns" attribute;

2) identification of network slice in the "snssais" attribute; and/or

3) identification of target UE(s) via "supis" attribute in the "tgtUe" attribute where the target UE(s) are one have the PDU Session for the DNN and/or S-NSSAI;

- and may include:

1) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to "SM\_CONGESTION" event, if the "EneNA" feature is supported.

NOTE 8: The predictions are not applicable for Session Management Congestion Control Experience analytics.

Upon the reception of an HTTP POST request with: "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions" as Resource URI and NnwdafEventsSubscription data structure as request body, if no errors occur, the NWDAF shall:

- create a new subscription;

- assign an event subscriptionId; and

- store the subscription.

If the NWDAF created an "Individual NWDAF Event Subscription" resource, the NWDAF shall respond with "201 Created" status code with the message body containing a representation of the created subscription, as shown in figure 4.2.2.2.2-1, step 2. If not all the requested analytics events in the subscription are accepted, then the NWDAF may include the "failEventReports" attribute indicating the event(s) for which the subscription failed and the associated reason(s). The NWDAF shall include a Location HTTP header field. The Location header field shall contain the URI of the created subscription i.e. "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions/{subscriptionId}". If the immediate reporting indication in the "immRep" attribute within the "evtReq" attribute sets to true in the event subscription, the NWDAF shall include the reports of the events subscribed, if available, in the HTTP POST response.

When the "notifFlag" attribute is included and set to "DEACTIVATE" in the request, the NWDAF shall mute the event notification and store the available events.

If the analytics target period provided in the body of the HTTP POST request includes the start time in the past and the end time in the future, the NWDAF shall reject the request with an HTTP "400 Bad Request" response including the "cause" attribute set to "BOTH\_STAT\_PRED\_NOT\_ALLOWED".

If the statistics in the past are requested but the necessary data to perform the service is unavailable, the NWDAF shall reject the request with an HTTP "500 Internal Server Error" response including the "cause" attribute set to "UNAVAILABLE\_DATA".

If the user consent has not been checked by the NF service consumer and is required for the requested analytics collection depending on local policy and regulations, then the NWDAF shall check user consent for the targeted UE(s) by retrieving the user consent subscription data via the Nudm\_SDM service API of the UDM as described in clause 5.2.2 of 3GPP TS 29.503 [23]. If the NWDAF receive the response from the UDM that it is not granted for the impacted user(s), then the NWDAF shall send an HTTP "403 Forbidden" error response including the "cause" attribute set to "USER\_CONSENT\_NOT\_GRANTED".

NOTE 9: When the target of reporting is a SUPI or a GPSI then the subscription can be rejected, e.g. because user consent is not granted, and the error is sent to the consumer. When the target of reporting is an Internal Group Id, or a list of SUPIs/GPSI(s) or any UE, and the user consent is not granted for a subset of the impacted users, then no error is sent, but a subset of the SUPIs/GPSIs is skipped if user consent is not granted.

If an error occurs when processing the HTTP POST request, the NWDAF shall send an HTTP error response as specified in clause 5.1.7.

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

##### 5.1.6.2.7 Type EventReportingRequirement

Table 5.1.6.2.7-1: Definition of type EventReportingRequirement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| accuracy | Accuracy | O | 0..1 | Preferred level of accuracy of the analytics. (NOTE 5) |  |
| accPerSubset | array(Accuracy) | O | 1..N | Each element indicates the preferred accuracy level per analytics subset. It may be present if the "listOfAnaSubsets" attribute is present in the subscription request when the subscription event is NF\_LOAD, UE\_COMM, DISPERSION, NETWORK\_PERFORMANCE, WLAN\_PERFORMANCE, DN\_PERFORMANCE, UE\_MOBILITY or SERVICE\_EXPERIENCE.(NOTE 4, NOTE 5) | EneNA |
| startTs | DateTime | O | 0..1 | UTC time indicating the start time of the observation period.The absence of this attribute means subscription at the present time unless the "offsetPeriod" attribute is included. (NOTE 3) |  |
| endTs | DateTime | O | 0..1 | UTC time indicating the end time of the observation period.If the start time is in the past, then the absence of this attribute means that the end time of the subscription is at the present time, unless the "offsetPeriod" attribute is included.If provided, it shall not be less than the start time. (NOTE 3) |  |
| offsetPeriod | integer | O | 0..1 | 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. (NOTE 3) | EneNA |
| sampRatio | SamplingRatio | O | 0..1 | Percentage of sampling (1%...100%) among impacted UEs.Applicable to event targeting a group of UEs or any UE.(NOTE 1) |  |
| maxSupiNbr | Uinteger | O | 0..1 | Represents the maximum number of SUPIs expected in an object. Applicable for the event(s) providing a list of SUPIs during the analytics response. |  |
| maxObjectNbr | Uinteger | O | 0..1 | Maximum number of objects expected for an analytics report. It's only applicable for the event(s) which may provide more than one entries or objects during event notification. |  |
| timeAnaNeeded | DateTime | O | 0..1 | UTC time indicating the time when analytcs information is needed. | EneNA |
| anaMeta | array(AnalyticsMetadata) | O | 1..N | List of analytics metadata that are requested to be included. | Aggregation |
| anaMetaInd | AnalyticsMetadataIndication | O | 0..1 | Contains values for the analytics metadata that the NF service consumer wants to be used for generating the analytics. | Aggregation |
| histAnaTimePeriod | TimeWindow | O | 0..1 | The time period of historical analytics indicates the start time and end time during which the historical analytics was generated. If this attribute is included, the NWDAF only needs to provide the existing analytics, and does not need to generate new analytics. | EneNA |
| NOTE 1: The "sampRatio" attribute within EventReportingRequirement data type is not applicable for the Nnwdaf\_EventsSubscription API.NOTE 2: Void.NOTE 3: When the "offsetPeriod" attribute is included, the "startTs" and "endTs" attributes shall not be included. If the analytics target period is indicated either by providing a "startTs" attribute and an "endTs" attribute that are equal, or by providing an "offsetPeriod" attribute equal to zero (which means there is no offset to the periodic reporting time indicated by the "repPeriod" attribute or "repetitionPeriod" attribute), then this is a request for analytics for a specific time of the same "startTs" attribute and "endTs" attribute or each specific time periodically indicated by the "repPeriod" attribute , rather than for a time interval. If none of the attributes "startTs", "endTs" and "offsetPeriod" is provided, the analytics target period starts at the present time and there is no specified end time.NOTE 4: If multiple accuracy entries are included, the order of the entries of the "accPerSubset" attribute corresponds with the order of the entries of the "listOfAnaSubsets" attribute, i.e. the first entry of the "accPerSubset" attribute holds the requested accuracy for the analytics subset that is indicated by the first entry of the "listOfAnaSubsets" attribute, and so on.NOTE 5: If both the "accuracy" attribute and "accPerSubset" attribute were provided in the request, the "accPerSubset" attribute takes precedence over the "accuracy" attribute. |

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

##### 5.1.6.3.18 Enumeration: AnalyticsSubset

Table 5.1.6.3.18-1: AnalyticsSubset

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| 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 or 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 ranked high (i.e.value 1), medium (2) or low (3). This value is only applicable to DISPERSION event. |  |
| PERCENTILE\_RANKING | Percentile ranking of the target UE in the Cumulative Distribution Function of data usage for the population of all UEs. This value is only applicable to DISPERSION event. |  |
| RSSI | Indicated the RSSI in the unit of dBm. This value is only applicable to WLAN\_PERFORMANCE event. |  |
| RTT | Indicates the RTT in the unit of millisecond. This value is only applicable to WLAN\_PERFORMANCE event. |  |
| TRAFFIC\_INFO | Traffic information including UL/DL data rate and/or Traffic volume. This value is only applicable to WLAN\_PERFORMANCE event. |  |
| NUMBER\_OF\_UES | Number of UEs observed for the SSID. This value is only applicable to WLAN\_PERFORMANCE event. |  |
| APP\_LIST\_FOR\_UE\_COMM | The analytics of the application list used by UE. This value is only applicable to UE\_COMM event. |  |
| N4\_SESS\_INACT\_TIMER\_FOR\_UE\_COMM | The N4 Session inactivity timer. This value is only applicable to UE\_COMM event. |  |
| AVG\_TRAFFIC\_RATE | Indicates average traffic rate. This value is only applicable to DN\_PERFORMANCE event. |  |
| MAX\_TRAFFIC\_RATE | Indicates maximum traffic rate. This value is only applicable to DN\_PERFORMANCE event. |  |
| AVG\_PACKET\_DELAY | Indicates average Packet Delay. This value is only applicable to DN\_PERFORMANCE event. |  |
| MAX\_PACKET\_DELAY | Indicates maximum Packet Delay. This value is only applicable to DN\_PERFORMANCE event. |  |
| AVG\_PACKET\_LOSS\_RATE | Indicates average Loss Rate. This value is only applicable to DN\_PERFORMANCE event. |  |
| UE\_LOCATION | Indicates UE location information. This value is only applicable to SERVICE\_EXPERIENCE event. |  |
| LIST\_OF\_HIGH\_EXP\_UE | Indicates list of high experienced UE. This value is only applicable to SM\_CONGESTION event. |  |
| LIST\_OF\_MEDIUM\_EXP\_UE | Indicates list of medium experienced UE. This value is only applicable to SM\_CONGESTION event. |  |
| LIST\_OF\_LOW\_EXP\_UE | Indicates list of low experienced UE. This value is only applicable to SM\_CONGESTION event. |  |
| AVG\_UL\_PKT\_DROP\_RATE | Indicates average uplink packet drop rate on GTP-U path on N3. This value is only applicable to RED\_TRANS\_EXP event. |  |
| VAR\_UL\_PKT\_DROP\_RATE | Indicates variance of uplink packet drop rate on GTP-U path on N3. This value is only applicable to RED\_TRANS\_EXP event. |  |
| AVG\_DL\_PKT\_DROP\_RATE | Indicates average downlink packet drop rate on GTP-U path on N3. This value is only applicable to RED\_TRANS\_EXP event. |  |
| VAR\_DL\_PKT\_DROP\_RATE | Indicates variance of downlink packet drop rate on GTP-U path on N3. This value is only applicable to RED\_TRANS\_EXP event. |  |
| AVG\_UL\_PKT\_DELAY | Indicates average uplink packet delay round trip on GTP-U path on N3. This value is only applicable to RED\_TRANS\_EXP event. |  |
| VAR\_UL\_PKT\_DELAY | Indicates variance uplink packet delay round trip on GTP-U path on N3. This value is only applicable to RED\_TRANS\_EXP event. |  |
| AVG\_DL\_PKT\_DELAY | Indicates average downlink packet delay round trip on GTP-U path on N3. This value is only applicable to RED\_TRANS\_EXP event. |  |
| VAR\_DL\_PKT\_DELAY | Indicates variance downlink packet delay round trip on GTP-U path on N3. This value is only applicable to RED\_TRANS\_EXP event. |  |
| USER\_LOCATION | Indicates the user location. This value is only applicable to UE\_MOBILITY event. | UeMobilityExt2\_eNA |
| 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. | UeMobilityExt2\_eNA |
| UE\_DIRECTION | Indicates the direction of the UEs. This value is only applicable to UE\_MOBILITY event. | UeMobilityExt2\_eNA |

Editor's Note: USER\_LOCATION, UE\_GEOG\_DIST and UE\_DIRECTION need to be refered by the corresponding attributes.

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

# A.2 Nnwdaf\_EventsSubscription API

openapi: 3.0.0

info:

 version: 1.3.0-alpha.2

 title: Nnwdaf\_EventsSubscription

 description: |

 Nnwdaf\_EventsSubscription Service API.

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externalDocs:

 description: 3GPP TS 29.520 V18.1.0; 5G System; Network Data Analytics Services.

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

security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

servers:

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

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /subscriptions:

 post:

 summary: Create a new Individual NWDAF Events Subscription

 operationId: CreateNWDAFEventsSubscription

 tags:

 - NWDAF Events Subscriptions (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Create a new Individual NWDAF Event Subscription resource.

 headers:

 Location:

 description: >

 Contains the URI of the newly created resource, according to the structure

 {apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions/{subscriptionId}

 required: true

 schema:

 type: string

 content:

 application/json:

 schema:

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '502':

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

 '503':

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

 default:

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

 callbacks:

 myNotification:

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

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 1

 responses:

 '204':

 description: The receipt of the Notification is acknowledged.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '502':

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

 '503':

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

 default:

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

 /subscriptions/{subscriptionId}:

 delete:

 summary: Delete an existing Individual NWDAF Events Subscription

 operationId: DeleteNWDAFEventsSubscription

 tags:

 - Individual NWDAF Events Subscription (Document)

 parameters:

 - name: subscriptionId

 in: path

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

 required: true

 schema:

 type: string

 responses:

 '204':

 description: >

 No Content. The Individual NWDAF Event Subscription resource matching the subscriptionId

 was deleted.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '429':

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

 '500':

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

 '501':

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

 '502':

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

 '503':

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

 default:

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

 put:

 summary: Update an existing Individual NWDAF Events Subscription

 operationId: UpdateNWDAFEventsSubscription

 tags:

 - Individual NWDAF Events Subscription (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: subscriptionId

 in: path

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

 required: true

 schema:

 type: string

 responses:

 '200':

 description: >

 The Individual NWDAF Event Subscription resource was modified successfully and a

 representation of that resource is returned.

 content:

 application/json:

 schema:

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

 '204':

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

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '501':

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

 '502':

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

 '503':

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

 default:

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

 /transfers:

 post:

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

 operationId: CreateNWDAFEventSubscriptionTransfer

 tags:

 - NWDAF Event Subscription Transfers (Collection)

 security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - nnwdaf-eventssubscription:transfer

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

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

 headers:

 Location:

 description: >

 Contains the URI of the newly created resource, according to the structure

 {apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers/{transferId}

 required: true

 schema:

 type: string

 '204':

 description: >

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

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

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '502':

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

 '503':

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

 default:

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

 /transfers/{transferId}:

 delete:

 summary: Delete an existing Individual NWDAF Event Subscription Transfer

 operationId: DeleteNWDAFEventSubscriptionTransfer

 tags:

 - Individual NWDAF Event Subscription Transfer (Document)

 security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - nnwdaf-eventssubscription:transfer

 parameters:

 - name: transferId

 in: path

 description: >

 String identifying a request for an analytics subscription transfer to the

 Nnwdaf\_EventsSubscription Service

 required: true

 schema:

 type: string

 responses:

 '204':

 description: >

 No Content. The Individual NWDAF Event Subscription Transfer resource matching the

 transferId was deleted.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '429':

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

 '500':

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

 '501':

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

 '502':

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

 '503':

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

 default:

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

 put:

 summary: Update an existing Individual NWDAF Event Subscription Transfer

 operationId: UpdateNWDAFEventSubscriptionTransfer

 tags:

 - Individual NWDAF Event Subscription Transfer (Document)

 security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

 - nnwdaf-eventssubscription:transfer

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: transferId

 in: path

 description: >

 String identifying a request for an analytics subscription transfer to the

 Nnwdaf\_EventsSubscription Service

 required: true

 schema:

 type: string

 responses:

 '204':

 description: >

 The Individual NWDAF Event Subscription Transfer resource was modified successfully.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '501':

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

 '502':

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

 '503':

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

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 nnwdaf-eventssubscription: Access to the Nnwdaf\_EventsSubscription API

 nnwdaf-eventssubscription:transfer: >

 Access to service operations applying to NWDAF event subscription transfer.

 schemas:

 NnwdafEventsSubscription:

 description: Represents an Individual NWDAF Event Subscription resource.

 type: object

 properties:

 eventSubscriptions:

 type: array

 items:

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

 minItems: 1

 description: Subscribed events

 evtReq:

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

 notificationURI:

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

 notifCorrId:

 type: string

 description: Notification correlation identifier.

 supportedFeatures:

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

 eventNotifications:

 type: array

 items:

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

 minItems: 1

 failEventReports:

 type: array

 items:

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

 minItems: 1

 prevSub:

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

 consNfInfo:

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

 required:

 - eventSubscriptions

 EventSubscription:

 description: Represents a subscription to a single event.

 type: object

 properties:

 anySlice:

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

 appIds:

 type: array

 items:

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

 minItems: 1

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

 deviations:

 type: array

 items:

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

 minItems: 1

 dnns:

 type: array

 items:

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

 minItems: 1

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

 dnais:

 type: array

 items:

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

 minItems: 1

 event:

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

 extraReportReq:

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

 ladnDnns:

 type: array

 items:

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

 minItems: 1

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

 loadLevelThreshold:

 type: integer

 description: >

 Indicates that the NWDAF shall report the corresponding network slice load level to the NF

 service consumer where the load level of the network slice identified by snssais is

 reached.

 notificationMethod:

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

 matchingDir:

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

 nfLoadLvlThds:

 type: array

 items:

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

 minItems: 1

 description: >

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

 nfInstanceIds:

 type: array

 items:

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

 minItems: 1

 nfSetIds:

 type: array

 items:

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

 minItems: 1

 nfTypes:

 type: array

 items:

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

 minItems: 1

 networkArea:

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

 visitedAreas:

 type: array

 items:

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

 minItems: 1

 maxTopAppUlNbr:

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

 maxTopAppDlNbr:

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

 nsiIdInfos:

 type: array

 items:

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

 minItems: 1

 nsiLevelThrds:

 type: array

 items:

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

 minItems: 1

 qosRequ:

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

 qosFlowRetThds:

 type: array

 items:

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

 minItems: 1

 ranUeThrouThds:

 type: array

 items:

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

 minItems: 1

 repetitionPeriod:

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

 snssaia:

 type: array

 items:

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

 minItems: 1

 description: >

 Identification(s) of network slice to which the subscription applies. It corresponds to

 snssais in the data model definition of 3GPP TS 29.520.

 tgtUe:

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

 congThresholds:

 type: array

 items:

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

 minItems: 1

 nwPerfRequs:

 type: array

 items:

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

 minItems: 1

 ueCommReqs:

 type: array

 items:

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

 minItems: 1

 ueMobilityReqs:

 type: array

 items:

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

 minItems: 1

 userDataConOrderCri:

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

 bwRequs:

 type: array

 items:

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

 minItems: 1

 excepRequs:

 type: array

 items:

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

 minItems: 1

 exptAnaType:

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

 exptUeBehav:

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

 ratFreqs:

 type: array

 items:

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

 minItems: 1

 listOfAnaSubsets:

 type: array

 items:

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

 minItems: 1

 disperReqs:

 type: array

 items:

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

 minItems: 1

 redTransReqs:

 type: array

 items:

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

 minItems: 1

 wlanReqs:

 type: array

 items:

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

 minItems: 1

 upfInfo:

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

 appServerAddrs:

 type: array

 items:

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

 minItems: 1

 dnPerfReqs:

 type: array

 items:

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

 minItems: 1

 required:

 - event

 NnwdafEventsSubscriptionNotification:

 description: Represents an Individual NWDAF Event Subscription Notification resource.

 type: object

 properties:

 eventNotifications:

 type: array

 items:

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

 minItems: 1

 description: Notifications about Individual Events

 subscriptionId:

 type: string

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

 notifCorrId:

 type: string

 description: Notification correlation identifier.

 oldSubscriptionId:

 type: string

 description: >

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

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

 target NWDAF.

 resourceUri:

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

 termCause:

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

 transEvents:

 type: array

 items:

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

 minItems: 1

 required:

 - subscriptionId

 oneOf:

 - required: [eventNotifications]

 - allOf:

 - required: [resourceUri]

 - required: [oldSubscriptionId]

 EventNotification:

 description: Represents a notification on events that occurred.

 type: object

 properties:

 event:

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

 start:

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

 expiry:

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

 timeStampGen:

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

 failNotifyCode:

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

 rvWaitTime:

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

 anaMetaInfo:

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

 nfLoadLevelInfos:

 type: array

 items:

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

 minItems: 1

 nsiLoadLevelInfos:

 type: array

 items:

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

 minItems: 1

 sliceLoadLevelInfo:

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

 svcExps:

 type: array

 items:

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

 minItems: 1

 qosSustainInfos:

 type: array

 items:

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

 minItems: 1

 ueComms:

 type: array

 items:

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

 minItems: 1

 ueMobs:

 type: array

 items:

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

 minItems: 1

 userDataCongInfos:

 type: array

 items:

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

 minItems: 1

 abnorBehavrs:

 type: array

 items:

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

 minItems: 1

 nwPerfs:

 type: array

 items:

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

 minItems: 1

 dnPerfInfos:

 type: array

 items:

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

 minItems: 1

 disperInfos:

 type: array

 items:

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

 minItems: 1

 redTransInfos:

 type: array

 items:

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

 minItems: 1

 wlanInfos:

 type: array

 items:

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

 minItems: 1

 smccExps:

 type: array

 items:

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

 minItems: 1

 required:

 - event

 ServiceExperienceInfo:

 description: Represents service experience information.

 type: object

 properties:

 svcExprc:

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

 svcExprcVariance:

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

 supis:

 type: array

 items:

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

 minItems: 1

 snssai:

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

 appId:

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

 srvExpcType:

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

 ueLocs:

 type: array

 items:

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

 minItems: 1

 upfInfo:

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

 dnai:

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

 appServerInst:

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

 confidence:

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

 dnn:

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

 networkArea:

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

 nsiId:

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

 ratio:

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

 ratFreq:

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

 required:

 - svcExprc

 BwRequirement:

 description: Represents bandwidth requirements.

 type: object

 properties:

 appId:

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

 marBwDl:

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

 marBwUl:

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

 mirBwDl:

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

 mirBwUl:

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

 required:

 - appId

 SliceLoadLevelInformation:

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

 type: object

 properties:

 loadLevelInformation:

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

 snssais:

 type: array

 items:

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

 minItems: 1

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

 required:

 - loadLevelInformation

 - snssais

 NsiLoadLevelInfo:

 description: >

 Represents the network slice and optionally the associated network slice instance and the

 load level information.

 type: object

 properties:

 loadLevelInformation:

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

 snssai:

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

 nsiId:

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

 resUsage:

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

 numOfExceedLoadLevelThr:

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

 exceedLoadLevelThrInd:

 type: boolean

 description: >

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

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

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

 EXCEED\_LOAD\_LEVEL\_THR\_IND.

 networkArea:

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

 timePeriod:

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

 resUsgThrCrossTimePeriod:

 type: array

 items:

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

 minItems: 1

 description: >

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

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

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

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

 "numOfExceedLoadLevelThr" attribute.

 numOfUes:

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

 numOfPduSess:

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

 confidence:

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

 required:

 - loadLevelInformation

 - snssai

 NsiIdInfo:

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

 type: object

 properties:

 snssai:

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

 nsiIds:

 type: array

 items:

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

 minItems: 1

 required:

 - snssai

 EventReportingRequirement:

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

 type: object

 properties:

 accuracy:

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

 accPerSubset:

 type: array

 items:

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

 minItems: 1

 description: >

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

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

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

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

 startTs:

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

 endTs:

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

 offsetPeriod:

 type: integer

 description: >

 Offset period in units of seconds to the reporting time, if the value is negative means

 statistics in the past offset period, otherwise a positive value means prediction in the

 future offset period. May be present if the "repPeriod" attribute is included within the

 "evtReq" attribute or the "repetitionPeriod" attribute is included within the

 EventSubscription type.

 sampRatio:

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

 maxObjectNbr:

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

 maxSupiNbr:

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

 timeAnaNeeded:

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

 anaMeta:

 type: array

 items:

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

 minItems: 1

 anaMetaInd:

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

 histAnaTimePeriod:

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

 TargetUeInformation:

 description: Identifies the target UE information.

 type: object

 properties:

 anyUe:

 type: boolean

 description: >

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

 supis:

 type: array

 items:

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

 minItems: 1

 gpsis:

 type: array

 items:

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

 minItems: 1

 intGroupIds:

 type: array

 items:

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

 minItems: 1

 UeMobility:

 description: Represents UE mobility information.

 type: object

 properties:

 ts:

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

 recurringTime:

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

 duration:

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

 durationVariance:

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

 locInfos:

 type: array

 items:

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

 minItems: 1

 allOf:

 - required: [duration]

 - required: [locInfos]

 - oneOf:

 - required: [ts]

 - required: [recurringTime]

 LocationInfo:

 description: Represents UE location information.

 type: object

 properties:

 loc:

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

 ratio:

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

 confidence:

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

 required:

 - loc

 UeCommunication:

 description: Represents UE communication information.

 type: object

 properties:

 commDur:

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

 commDurVariance:

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

 perioTime:

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

 perioTimeVariance:

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

 ts:

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

 tsVariance:

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

 recurringTime:

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

 trafChar:

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

 ratio:

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

 perioCommInd:

 type: boolean

 description: >

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

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

 confidence:

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

 anaOfAppList:

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

 sessInactTimer:

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

 allOf:

 - required: [commDur]

 - required: [trafChar]

 - oneOf:

 - required: [ts]

 - required: [recurringTime]

 TrafficCharacterization:

 description: Identifies the detailed traffic characterization.

 type: object

 properties:

 dnn:

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

 snssai:

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

 appId:

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

 fDescs:

 type: array

 items:

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

 minItems: 1

 maxItems: 2

 ulVol:

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

 ulVolVariance:

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

 dlVol:

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

 dlVolVariance:

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

 anyOf:

 - required: [ulVol]

 - required: [dlVol]

 UserDataCongestionInfo:

 description: Represents the user data congestion information.

 type: object

 properties:

 networkArea:

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

 congestionInfo:

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

 snssai:

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

 required:

 - networkArea

 - congestionInfo

 CongestionInfo:

 description: Represents the congestion information.

 type: object

 properties:

 congType:

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

 timeIntev:

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

 nsi:

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

 confidence:

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

 topAppListUl:

 type: array

 items:

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

 minItems: 1

 topAppListDl:

 type: array

 items:

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

 minItems: 1

 required:

 - congType

 - timeIntev

 - nsi

 TopApplication:

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

 type: object

 properties:

 appId:

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

 ipTrafficFilter:

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

 ratio:

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

 oneOf:

 - required: [appId]

 - required: [ipTrafficFilter]

 QosSustainabilityInfo:

 description: Represents the QoS Sustainability information.

 type: object

 properties:

 areaInfo:

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

 startTs:

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

 endTs:

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

 qosFlowRetThd:

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

 ranUeThrouThd:

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

 snssai:

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

 confidence:

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

 oneOf:

 - required: [qosFlowRetThd]

 - required: [ranUeThrouThd]

 QosRequirement:

 description: Represents the QoS requirements.

 type: object

 properties:

 5qi:

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

 gfbrUl:

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

 gfbrDl:

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

 resType:

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

 pdb:

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

 per:

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

 deviceSpeed:

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

 deviceType:

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

 oneOf:

 - required: [5qi]

 - required: [resType]

 ThresholdLevel:

 description: Represents a threshold level.

 type: object

 properties:

 congLevel:

 type: integer

 nfLoadLevel:

 type: integer

 nfCpuUsage:

 type: integer

 nfMemoryUsage:

 type: integer

 nfStorageUsage:

 type: integer

 avgTrafficRate:

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

 maxTrafficRate:

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

 avgPacketDelay:

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

 maxPacketDelay:

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

 avgPacketLossRate:

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

 svcExpLevel:

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

 NfLoadLevelInformation:

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

 type: object

 properties:

 nfType:

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

 nfInstanceId:

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

 nfSetId:

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

 nfStatus:

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

 nfCpuUsage:

 type: integer

 nfMemoryUsage:

 type: integer

 nfStorageUsage:

 type: integer

 nfLoadLevelAverage:

 type: integer

 nfLoadLevelpeak:

 type: integer

 nfLoadAvgInAoi:

 type: integer

 snssai:

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

 confidence:

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

 allOf:

 - required: [nfType]

 - required: [nfInstanceId]

 - anyOf:

 - required: [nfStatus]

 - required: [nfCpuUsage]

 - required: [nfMemoryUsage]

 - required: [nfStorageUsage]

 - required: [nfLoadLevelAverage]

 - required: [nfLoadLevelPeak]

 NfStatus:

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

 type: object

 properties:

 statusRegistered:

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

 statusUnregistered:

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

 statusUndiscoverable:

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

 anyOf:

 - required: [statusRegistered]

 - required: [statusUnregistered]

 - required: [statusUndiscoverable]

 AnySlice:

 type: boolean

 description: >

 "false" represents not applicable for all slices. "true" represents applicable for all slices.

 LoadLevelInformation:

 type: integer

 description: >

 Load level information of the network slice and the optionally associated network slice

 instance.

 AbnormalBehaviour:

 description: Represents the abnormal behaviour information.

 type: object

 properties:

 supis:

 type: array

 items:

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

 minItems: 1

 excep:

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

 dnn:

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

 snssai:

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

 ratio:

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

 amount:

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

 confidence:

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

 addtMeasInfo:

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

 required:

 - excep

 Exception:

 description: Represents the Exception information.

 type: object

 properties:

 excepId:

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

 excepLevel:

 type: integer

 excepTrend:

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

 required:

 - excepId

 AdditionalMeasurement:

 description: Represents additional measurement information.

 type: object

 properties:

 unexpLoc:

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

 unexpFlowTeps:

 type: array

 items:

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

 minItems: 1

 unexpWakes:

 type: array

 items:

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

 minItems: 1

 ddosAttack:

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

 wrgDest:

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

 circums:

 type: array

 items:

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

 minItems: 1

 IpEthFlowDescription:

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

 type: object

 properties:

 ipTrafficFilter:

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

 ethTrafficFilter:

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

 oneOf:

 - required: [ipTrafficFilter]

 - required: [ethTrafficFilter]

 AddressList:

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

 type: object

 properties:

 ipv4Addrs:

 type: array

 items:

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

 minItems: 1

 ipv6Addrs:

 type: array

 items:

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

 minItems: 1

 CircumstanceDescription:

 description: Contains the description of a circumstance.

 type: object

 properties:

 freq:

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

 tm:

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

 locArea:

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

 vol:

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

 RetainabilityThreshold:

 description: Represents a QoS flow retainability threshold.

 type: object

 properties:

 relFlowNum:

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

 relTimeUnit:

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

 relFlowRatio:

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

 oneOf:

 - allOf:

 - required: [relFlowNum]

 - required: [relTimeUnit]

 - required: [relFlowRatio]

 NetworkPerfRequirement:

 description: Represents a network performance requirement.

 type: object

 properties:

 nwPerfType:

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

 relativeRatio:

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

 absoluteNum:

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

 orderCriterion:

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

 required:

 - nwPerfType

 NetworkPerfInfo:

 description: Represents the network performance information.

 type: object

 properties:

 networkArea:

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

 nwPerfType:

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

 anaPeriod:

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

 relativeRatio:

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

 absoluteNum:

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

 confidence:

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

 allOf:

 - required: [networkArea]

 - required: [nwPerfType]

 - oneOf:

 - required: [relativeRatio]

 - required: [absoluteNum]

 FailureEventInfo:

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

 type: object

 properties:

 event:

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

 failureCode:

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

 required:

 - event

 - failureCode

 AnalyticsMetadataIndication:

 description: >

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

 type: object

 properties:

 dataWindow:

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

 dataStatProps:

 type: array

 items:

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

 minItems: 1

 strategy:

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

 aggrNwdafIds:

 type: array

 items:

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

 minItems: 1

 AnalyticsMetadataInfo:

 description: Contains analytics metadata information required for analytics aggregation.

 type: object

 properties:

 numSamples:

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

 dataWindow:

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

 dataStatProps:

 type: array

 items:

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

 minItems: 1

 strategy:

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

 accuracy:

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

 NumberAverage:

 description: Represents average and variance information.

 type: object

 properties:

 number:

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

 variance:

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

 skewness:

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

 required:

 - number

 - variance

 AnalyticsSubscriptionsTransfer:

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

 type: object

 properties:

 subsTransInfos:

 type: array

 items:

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

 minItems: 1

 failTransEventReports:

 type: array

 items:

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

 minItems: 1

 required:

 - subsTransInfos

 SubscriptionTransferInfo:

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

 type: object

 properties:

 transReqType:

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

 nwdafEvSub:

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

 consumerId:

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

 contextId:

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

 sourceNfIds:

 type: array

 items:

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

 minItems: 1

 sourceSetIds:

 type: array

 items:

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

 minItems: 1

 modelInfo:

 type: array

 items:

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

 minItems: 1

 required:

 - transReqType

 - nwdafEvSub

 - consumerId

 ModelInfo:

 description: Contains information about an ML model.

 type: object

 properties:

 analyticsId:

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

 mlModelInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - analyticsId

 - mlModelInfos

 MLModelInfo:

 description: Contains information about an ML models.

 type: object

 properties:

 mlFileAddrs:

 type: array

 items:

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

 minItems: 1

 modelProvId:

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

 modelProvSetId:

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

 oneOf:

 - required: [modelProvId]

 - required: [modelProvSetId]

 AnalyticsContextIdentifier:

 description: Contains information about available analytics contexts.

 type: object

 properties:

 subscriptionId:

 type: string

 description: The identifier of a subscription.

 nfAnaCtxts:

 type: array

 items:

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

 minItems: 1

 description: >

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

 ueAnaCtxts:

 type: array

 items:

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

 minItems: 1

 description: >

 List of objects that indicate for which SUPI and analytics types combinations analytics

 context can be retrieved.

 allOf:

 - anyOf:

 - required: [nfAnaCtxts]

 - required: [ueAnaCtxts]

 - required: [subscriptionId]

 UeAnalyticsContextDescriptor:

 description: Contains information about available UE related analytics contexts.

 type: object

 properties:

 supi:

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

 anaTypes:

 type: array

 items:

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

 minItems: 1

 description: >

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

 required:

 - supi

 - anaTypes

 DnPerfInfo:

 description: Represents DN performance information.

 type: object

 properties:

 appId:

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

 dnn:

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

 snssai:

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

 dnPerf:

 type: array

 items:

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

 minItems: 1

 confidence:

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

 required:

 - dnPerf

 DnPerf:

 description: Represents DN performance for the application.

 type: object

 properties:

 appServerInsAddr:

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

 upfInfo:

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

 dnai:

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

 perfData:

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

 spatialValidCon:

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

 temporalValidCon:

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

 required:

 - perfData

 PerfData:

 description: Represents DN performance data.

 type: object

 properties:

 avgTrafficRate:

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

 maxTrafficRate:

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

 avePacketDelay:

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

 maxPacketDelay:

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

 avgPacketLossRate:

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

 DispersionRequirement:

 description: Represents the dispersion analytics requirements.

 type: object

 properties:

 disperType:

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

 classCriters:

 type: array

 items:

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

 minItems: 1

 rankCriters:

 type: array

 items:

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

 minItems: 1

 dispOrderCriter:

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

 order:

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

 required:

 - disperType

 ClassCriterion:

 description: >

 Indicates the dispersion class criterion for fixed, camper and/or traveller UE, and/or the

 top-heavy UE dispersion class criterion.

 type: object

 properties:

 disperClass:

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

 classThreshold:

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

 thresMatch:

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

 required:

 - disperClass

 - classThreshold

 - thresMatch

 RankingCriterion:

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

 type: object

 properties:

 highBase:

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

 lowBase:

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

 required:

 - highBase

 - lowBase

 DispersionInfo:

 description: >

 Represents the Dispersion information. When subscribed event is "DISPERSION", the

 "disperInfos" attribute shall be included.

 type: object

 properties:

 tsStart:

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

 tsDuration:

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

 disperCollects:

 type: array

 items:

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

 minItems: 1

 disperType:

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

 required:

 - tsStart

 - tsDuration

 - disperCollects

 - disperType

 DispersionCollection:

 description: Dispersion collection per UE location or per slice.

 type: object

 properties:

 ueLoc:

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

 snssai:

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

 supis:

 type: array

 items:

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

 minItems: 1

 gpsis:

 type: array

 items:

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

 minItems: 1

 appVolumes:

 type: array

 items:

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

 minItems: 1

 disperAmount:

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

 disperClass:

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

 usageRank:

 type: integer

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

 minimum: 1

 maximum: 3

 percentileRank:

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

 ueRatio:

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

 confidence:

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

 allOf:

 - oneOf:

 - required: [ueLoc]

 - required: [snssai]

 - anyOf:

 - required: [disperAmount]

 - required: [disperClass]

 - required: [usageRank]

 - required: [percentileRank]

 ApplicationVolume:

 description: Application data volume per Application Id.

 type: object

 properties:

 appId:

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

 appVolume:

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

 required:

 - appId

 - appVolume

 RedundantTransmissionExpReq:

 description: Represents other redundant transmission experience analytics requirements.

 type: object

 properties:

 redTOrderCriter:

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

 order:

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

 RedundantTransmissionExpInfo:

 description: >

 The redundant transmission experience related information. When subscribed event is

 "RED\_TRANS\_EXP", the "redTransInfos" attribute shall be included.

 type: object

 properties:

 spatialValidCon:

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

 dnn:

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

 redTransExps:

 type: array

 items:

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

 minItems: 1

 required:

 - redTransExps

 RedundantTransmissionExpPerTS:

 description: The redundant transmission experience per Time Slot.

 type: object

 properties:

 tsStart:

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

 tsDuration:

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

 obsvRedTransExp:

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

 redTransStatus:

 type: boolean

 description: >

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

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

 ueRatio:

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

 confidence:

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

 required:

 - tsStart

 - tsDuration

 - obsvRedTransExp

 ObservedRedundantTransExp:

 description: Represents the observed redundant transmission experience related information.

 type: object

 properties:

 avgPktDropRateUl:

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

 varPktDropRateUl:

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

 avgPktDropRateDl:

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

 varPktDropRateDl:

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

 avgPktDelayUl:

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

 varPktDelayUl:

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

 avgPktDelayDl:

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

 varPktDelayDl:

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

 WlanPerformanceReq:

 description: Represents other WLAN performance analytics requirements.

 type: object

 properties:

 ssIds:

 type: array

 items:

 type: string

 minItems: 1

 bssIds:

 type: array

 items:

 type: string

 minItems: 1

 wlanOrderCriter:

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

 order:

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

 WlanPerformanceInfo:

 description: The WLAN performance related information.

 type: object

 properties:

 networkArea:

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

 wlanPerSsidInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - wlanPerSsidInfos

 WlanPerSsIdPerformanceInfo:

 description: The WLAN performance per SSID.

 type: object

 properties:

 ssId:

 type: string

 wlanPerTsInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - ssId

 - wlanPerTsInfos

 WlanPerTsPerformanceInfo:

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

 type: object

 properties:

 tsStart:

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

 tsDuration:

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

 rssi:

 type: integer

 rtt:

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

 trafficInfo:

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

 numberOfUes:

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

 confidence:

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

 required:

 - tsStart

 - tsDuration

 anyOf:

 - required: [rssi]

 - required: [rtt]

 - required: [trafficInfo]

 - required: [numberOfUes]

 TrafficInformation:

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

 type: object

 properties:

 uplinkRate:

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

 downlinkRate:

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

 uplinkVolume:

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

 downlinkVolume:

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

 totalVolume:

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

 anyOf:

 - required: [uplinkRate]

 - required: [downlinkRate]

 - required: [uplinkVolume]

 - required: [downlinkVolume]

 - required: [totalVolume]

 AppListForUeComm:

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

 type: object

 properties:

 appId:

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

 startTime:

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

 appDur:

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

 occurRatio:

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

 spatialValidity:

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

 required:

 - appId

 SessInactTimerForUeComm:

 description: Represents the N4 Session inactivity timer.

 type: object

 properties:

 n4SessId:

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

 sessInactiveTimer:

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

 required:

 - n4SessId

 - sessInactiveTimer

 DnPerformanceReq:

 description: Represents other DN performance analytics requirements.

 type: object

 properties:

 dnPerfOrderCriter:

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

 order:

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

 reportThresholds:

 type: array

 items:

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

 minItems: 1

 RatFreqInformation:

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

 type: object

 properties:

 allFreq:

 type: boolean

 description: >

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

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

 exclusive.

 allRat:

 type: boolean

 description: >

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

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

 exclusive.

 freq:

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

 ratType:

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

 svcExpThreshold:

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

 matchingDir:

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

 PrevSubInfo:

 description: Information of the previous subscription.

 type: object

 properties:

 producerId:

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

 producerSetId:

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

 subscriptionId:

 type: string

 description: The identifier of a subscription.

 nfAnaEvents:

 type: array

 items:

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

 minItems: 1

 ueAnaEvents:

 type: array

 items:

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

 minItems: 1

 required:

 - subscriptionId

 oneOf:

 - required: [producerId]

 - required: [producerSetId]

 ResourceUsage:

 description: >

 The current usage of the virtual resources assigned to the NF instances belonging to a

 particular network slice instance.

 type: object

 properties:

 cpuUsage:

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

 memoryUsage:

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

 storageUsage:

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

 ConsumerNfInformation:

 description: Represents the analytics consumer NF Information.

 type: object

 properties:

 nfId:

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

 nfSetId:

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

 taiList:

 type: array

 items:

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

 minItems: 1

 oneOf:

 - oneOf:

 - required: [nfId]

 - required: [nfSetId]

 - required: [taiList]

 UeCommReq:

 description: UE communication analytics requirement.

 type: object

 properties:

 orderCriterion:

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

 orderDirection:

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

 UeMobilityReq:

 description: UE mobility analytics requirement.

 type: object

 properties:

 orderCriterion:

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

 orderDirection:

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

#

# ENUMERATIONS DATA TYPES

#

 NotificationMethod:

 anyOf:

 - type: string

 enum:

 - PERIODIC

 - THRESHOLD

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the notification methods for the subscribed events.

 Possible values are:

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

 between the notifications is identified by repetitionPeriod and represents time in

 seconds.

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

 NwdafEvent:

 anyOf:

 - type: string

 enum:

 - SLICE\_LOAD\_LEVEL

 - NETWORK\_PERFORMANCE

 - NF\_LOAD

 - SERVICE\_EXPERIENCE

 - UE\_MOBILITY

 - UE\_COMMUNICATION

 - QOS\_SUSTAINABILITY

 - ABNORMAL\_BEHAVIOUR

 - USER\_DATA\_CONGESTION

 - NSI\_LOAD\_LEVEL

 - DN\_PERFORMANCE

 - DISPERSION

 - RED\_TRANS\_EXP

 - WLAN\_PERFORMANCE

 - SM\_CONGESTION

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Describes the NWDAF Events.

 Possible values are:

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

 Slice.

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

 information.

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

 Network Functions.

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

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

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

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

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

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

 information.

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

 Slice and the optionally associated Network Slice Instance.

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

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

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

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

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

 for specific DNN and/or S-NSSAI.

 Accuracy:

 anyOf:

 - type: string

 enum:

 - LOW

 - MEDIUM

 - HIGH

 - HIGHEST

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the preferred level of accuracy of the analytics.

 Possible values are:

 - LOW: Low accuracy.

 - MEDIUM: Medium accuracy.

 - HIGH: High accuracy.

 - HIGHEST: Highest accuracy.

 CongestionType:

 anyOf:

 - type: string

 enum:

 - USER\_PLANE

 - CONTROL\_PLANE

 - USER\_AND\_CONTROL\_PLANE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Indicates the congestion analytics type.

 Possible values are:

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

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

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

 ExceptionId:

 anyOf:

 - type: string

 enum:

 - UNEXPECTED\_UE\_LOCATION

 - UNEXPECTED\_LONG\_LIVE\_FLOW

 - UNEXPECTED\_LARGE\_RATE\_FLOW

 - UNEXPECTED\_WAKEUP

 - SUSPICION\_OF\_DDOS\_ATTACK

 - WRONG\_DESTINATION\_ADDRESS

 - TOO\_FREQUENT\_SERVICE\_ACCESS

 - UNEXPECTED\_RADIO\_LINK\_FAILURES

 - PING\_PONG\_ACROSS\_CELLS

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Describes the Exception Id.

 Possible values are:

 - UNEXPECTED\_UE\_LOCATION: Unexpected UE location.

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

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

 - UNEXPECTED\_WAKEUP: Unexpected wakeup.

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

 - WRONG\_DESTINATION\_ADDRESS: Wrong destination address.

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

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

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

 ExceptionTrend:

 anyOf:

 - type: string

 enum:

 - UP

 - DOWN

 - UNKNOW

 - STABLE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the Exception Trend.

 Possible values are:

 - UP: Up trend of the exception level.

 - DOWN: Down trend of the exception level.

 - UNKNOW: Unknown trend of the exception level.

 - STABLE: Stable trend of the exception level.

 TimeUnit:

 anyOf:

 - type: string

 enum:

 - MINUTE

 - HOUR

 - DAY

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the unit for the session active time.

 Possible values are:

 - MINUTE: Time unit is per minute.

 - HOUR: Time unit is per hour.

 - DAY: Time unit is per day.

 NetworkPerfType:

 anyOf:

 - type: string

 enum:

 - GNB\_ACTIVE\_RATIO

 - GNB\_COMPUTING\_USAGE

 - GNB\_MEMORY\_USAGE

 - GNB\_DISK\_USAGE

 - NUM\_OF\_UE

 - SESS\_SUCC\_RATIO

 - HO\_SUCC\_RATIO

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the network performance types.

 Possible values are:

 - GNB\_ACTIVE\_RATIO: Indicates that the network performance requirement is gNodeB active

 (i.e. up and running) rate. Indicates the ratio of gNB active (i.e. up and running) number

 to the total number of gNB.

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

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

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

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

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

 session setup attempts.

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

 ExpectedAnalyticsType:

 anyOf:

 - type: string

 enum:

 - MOBILITY

 - COMMUN

 - MOBILITY\_AND\_COMMUN

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the expected UE analytics type.

 Possible values are:

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

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

 - MOBILITY\_AND\_COMMUN: Both mobility and communication related abnormal behaviour analytics

 is expected by the consumer.

 MatchingDirection:

 anyOf:

 - type: string

 enum:

 - ASCENDING

 - DESCENDING

 - CROSSED

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the matching direction when crossing a threshold.

 Possible values are:

 - ASCENDING: Threshold is crossed in ascending direction.

 - DESCENDING: Threshold is crossed in descending direction.

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

 NwdafFailureCode:

 anyOf:

 - type: string

 enum:

 - UNAVAILABLE\_DATA

 - BOTH\_STAT\_PRED\_NOT\_ALLOWED

 - UNSATISFIED\_REQUESTED\_ANALYTICS\_TIME

 - OTHER

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the failure reason.

 Possible values are:

 - UNAVAILABLE\_DATA: Indicates the requested statistics information for the event is rejected

 since necessary data to perform the service is unavailable.

 - BOTH\_STAT\_PRED\_NOT\_ALLOWED: Indicates the requested analysis information for the event is

 rejected since the start time is in the past and the end time is in the future, which

 means the NF service consumer requested both statistics and prediction for the analytics.

 - UNSATISFIED\_REQUESTED\_ANALYTICS\_TIME: Indicates that the requested event is rejected since

 the analytics information is not ready when the time indicated by the "timeAnaNeeded"

 attribute (as provided during the creation or modification of subscription) is reached.

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

 reasons.

 AnalyticsMetadata:

 anyOf:

 - type: string

 enum:

 - NUM\_OF\_SAMPLES

 - DATA\_WINDOW

 - DATA\_STAT\_PROPS

 - STRATEGY

 - ACCURACY

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

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

 Possible values are:

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

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

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

 analytics.

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

 - ACCURACY: Level of accuracy reached for the analytics.

 DatasetStatisticalProperty:

 anyOf:

 - type: string

 enum:

 - UNIFORM\_DIST\_DATA

 - NO\_OUTLIERS

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the dataset statistical properties.

 Possible values are:

 - UNIFORM\_DIST\_DATA: Indicates the use of data samples that are uniformly distributed

 according to the different aspects of the requested analytics.

 - NO\_OUTLIERS: Indicates that the data samples shall disregard data samples that are at

 the extreme boundaries of the value range.

 OutputStrategy:

 anyOf:

 - type: string

 enum:

 - BINARY

 - GRADIENT

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the output strategy used for the analytics reporting.

 Possible values are:

 - BINARY: Indicates that the analytics shall only be reported when the requested level

 of accuracy is reached within a cycle of periodic notification.

 - GRADIENT: Indicates that the analytics shall be reported according with the periodicity

 irrespective of whether the requested level of accuracy has been reached or not.

 TransferRequestType:

 anyOf:

 - type: string

 enum:

 - PREPARE

 - TRANSFER

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the request type for the analytics subscription transfer.

 Possible values are:

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

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

 AnalyticsSubset:

 anyOf:

 - type: string

 enum:

 - NUM\_OF\_UE\_REG

 - NUM\_OF\_PDU\_SESS\_ESTBL

 - RES\_USAGE

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

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

 - EXCEED\_LOAD\_LEVEL\_THR\_IND

 - LIST\_OF\_TOP\_APP\_UL

 - LIST\_OF\_TOP\_APP\_DL

 - NF\_STATUS

 - NF\_RESOURCE\_USAGE

 - NF\_LOAD

 - NF\_PEAK\_LOAD

 - NF\_LOAD\_AVG\_IN\_AOI

 - DISPER\_AMOUNT

 - DISPER\_CLASS

 - RANKING

 - PERCENTILE\_RANKING

 - RSSI

 - RTT

 - TRAFFIC\_INFO

 - NUMBER\_OF\_UES

 - APP\_LIST\_FOR\_UE\_COMM

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

 - AVG\_TRAFFIC\_RATE

 - MAX\_TRAFFIC\_RATE

 - AVG\_PACKET\_DELAY

 - MAX\_PACKET\_DELAY

 - AVG\_PACKET\_LOSS\_RATE

 - UE\_LOCATION

 - LIST\_OF\_HIGH\_EXP\_UE

 - LIST\_OF\_MEDIUM\_EXP\_UE

 - LIST\_OF\_LOW\_EXP\_UE

 - AVG\_UL\_PKT\_DROP\_RATE

 - VAR\_UL\_PKT\_DROP\_RATE

 - AVG\_DL\_PKT\_DROP\_RATE

 - VAR\_DL\_PKT\_DROP\_RATE

 - AVG\_UL\_PKT\_DELAY

 - VAR\_UL\_PKT\_DELAY

 - AVG\_DL\_PKT\_DELAY

 - VAR\_DL\_PKT\_DELAY

 - UE\_GEOG\_DIST

 - UE\_DIRECTION

 - USER\_LOCATION

 - type: string

 description: >

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 content defined in the present version of this API.

 description: |

 Represents the analytics subset.

 Possible values are:

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

 NSI\_LOAD\_LEVEL event.

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

 applicable to NSI\_LOAD\_LEVEL event.

 - RES\_USAGE: The current usage of the virtual resources assigned to the NF instances

 belonging to a particular network slice instance. This value is only applicable to

 NSI\_LOAD\_LEVEL event.

 - NUM\_OF\_EXCEED\_RES\_USAGE\_LOAD\_LEVEL\_THR: The number of times the resource usage threshold

 of the network slice instance is reached or exceeded if a threshold value is provided by

 the consumer. This value is only applicable to NSI\_LOAD\_LEVEL event.

 - PERIOD\_OF\_EXCEED\_RES\_USAGE\_LOAD\_LEVEL\_THR: The time interval between each time the

 threshold being met or exceeded on the network slice (instance). This value is only

 applicable to NSI\_LOAD\_LEVEL event.

 - EXCEED\_LOAD\_LEVEL\_THR\_IND: Whether the Load Level Threshold is met or exceeded by the

 statistics value. This value is only applicable to NSI\_LOAD\_LEVEL event.

 - LIST\_OF\_TOP\_APP\_UL: The list of applications that contribute the most to the traffic in

 the UL direction. This value is only applicable to USER\_DATA\_CONGESTION event.

 - LIST\_OF\_TOP\_APP\_DL: The list of applications that contribute the most to the traffic in

 the DL direction. This value is only applicable to USER\_DATA\_CONGESTION event.

 - NF\_STATUS: The availability status of the NF on the Analytics target period, expressed

 as a percentage of time per status value (registered, suspended, undiscoverable). This

 value is only applicable to NF\_LOAD event.

 - NF\_RESOURCE\_USAGE: The average usage of assigned resources (CPU, memory, storage). This

 value is only applicable to NF\_LOAD event.

 - NF\_LOAD: The average load of the NF instance over the Analytics target period. This value

 is only applicable to NF\_LOAD event.

 - NF\_PEAK\_LOAD: The maximum load of the NF instance over the Analytics target period. This

 value is only applicable to NF\_LOAD event.

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

 value is only applicable to NF\_LOAD event.

 - DISPER\_AMOUNT: Indicates the dispersion amount of the reported data volume or transaction

 dispersion type. This value is only applicable to DISPERSION event.

 - DISPER\_CLASS: Indicates the dispersion mobility class: fixed, camper, traveller upon set

 its usage threshold, and/or the top-heavy class upon set its percentile rating threshold.

 This value is only applicable to DISPERSION event.

 - RANKING: Data/transaction usage ranking high (i.e.value 1), medium (2) or low (3). This

 value is only applicable to DISPERSION event.

 - PERCENTILE\_RANKING: Percentile ranking of the target UE in the Cumulative Distribution

 Function of data usage for the population of all UEs. This value is only applicable to

 DISPERSION event.

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

 WLAN\_PERFORMANCE event.

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

 WLAN\_PERFORMANCE event.

 - TRAFFIC\_INFO: Traffic information including UL/DL data rate and/or Traffic volume. This

 value is only applicable to WLAN\_PERFORMANCE event.

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

 WLAN\_PERFORMANCE event.

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

 applicable to UE\_COMM event.

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

 applicable to UE\_COMM event.

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

 DN\_PERFORMANCE event.

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

 DN\_PERFORMANCE event.

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

 DN\_PERFORMANCE event.

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

 DN\_PERFORMANCE event.

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

 DN\_PERFORMANCE event.

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

 SERVICE\_EXPERIENCE event.

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

 to SM\_CONGESTION event.

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

 applicable to SM\_CONGESTION event.

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

 SM\_CONGESTION event.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

 - 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.

 - USER\_LOCATION: Indicates the user location. This value is only applicable to UE\_MOBILITY

 event.

 DispersionType:

 oneOf:

 - type: string

 enum:

 - DVDA

 - TDA

 - DVDA\_AND\_TDA

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the dispersion type.

 Possible values are:

 - DVDA: Data Volume Dispersion Analytics.

 - TDA: Transactions Dispersion Analytics.

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

 DispersionClass:

 oneOf:

 - type: string

 enum:

 - FIXED

 - CAMPER

 - TRAVELLER

 - TOP\_HEAVY

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the dispersion class.

 Possible values are:

 - FIXED: Dispersion class as fixed UE its data or transaction usage at a location or

 a slice, is higher than its class threshold set for its all data or transaction usage.

 - CAMPER: Dispersion class as camper UE, its data or transaction usage at a location or

 a slice, is higher than its class threshold and lower than the fixed class threshold set

 for its all data or transaction usage.

 - TRAVELLER: Dispersion class as traveller UE, its data or transaction usage at a location

 or a slice, is lower than the camper class threshold set for its all data or transaction

 usage.

 - TOP\_HEAVY: Dispersion class as Top\_Heavy UE, who's dispersion percentile rating at a

 location or a slice, is higher than its class threshold.

 DispersionOrderingCriterion:

 anyOf:

 - type: string

 enum:

 - TIME\_SLOT\_START

 - DISPERSION

 - CLASSIFICATION

 - RANKING

 - PERCENTILE\_RANKING

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

 Represents the order criterion for the list of dispersion.

 Possible values are:

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

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

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

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

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

 DeviceType:

 anyOf:

 - type: string

 enum:

 - MOBILE\_PHONE

 - SMART\_PHONE

 - TABLET

 - DONGLE

 - MODEM

 - WLAN\_ROUTER

 - IOT\_DEVICE

 - WEARABLE

 - MOBILE\_TEST\_PLATFORM

 - UNDEFINED

 - type: string

 description: >

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

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

 description: |

 Possible values are:

 - MOBILE\_PHONE: Mobile Phone.

 - SMART\_PHONE: Smartphone.

 - TABLET: Tablet.

 - DONGLE: Dongle.

 - MODEM: Modem.

 - WLAN\_ROUTER: WLAN Router.

 - IOT\_DEVICE: IoT Device.

 - WEARABLE: Wearable.

 - MOBILE\_TEST\_PLATFORM: Mobile Test Platform.

 - UNDEFINED: Undefined.

 RedTransExpOrderingCriterion:

 anyOf:

 - type: string

 enum:

 - TIME\_SLOT\_START

 - RED\_TRANS\_EXP

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

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

 Possible values are:

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

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

 WlanOrderingCriterion:

 anyOf:

 - type: string

 enum:

 - TIME\_SLOT\_START

 - NUMBER\_OF\_UES

 - RSSI

 - RTT

 - TRAFFIC\_INFO

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: |

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

 Possible values are:

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

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

 - RSSI: Indicates the order of RSSI.

 - RTT: Indicates the order of RTT.

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

 ServiceExperienceType:

 anyOf:

 - type: string

 enum:

 - VOICE

 - VIDEO

 - OTHER

 - type: string

 description: >

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

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

 description: |

 Represents the type of the service experience analytics.

 Possible values are:

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

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

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

 DnPerfOrderingCriterion:

 anyOf:

 - type: string

 enum:

 - AVERAGE\_TRAFFIC\_RATE

 - MAXIMUM\_TRAFFIC\_RATE

 - AVERAGE\_PACKET\_DELAY

 - MAXIMUM\_PACKET\_DELAY

 - AVERAGE\_PACKET\_LOSS\_RATE

 - type: string

 description: >

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

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

 description: |

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

 Possible values are:

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

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

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

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

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

 TermCause:

 anyOf:

 - type: string

 enum:

 - USER\_CONSENT\_REVOKED

 - NWDAF\_OVERLOAD

 - UE\_LEFT\_AREA

 - type: string

 description: >

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

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

 description: |

 Represents the cause for the analytics subscription termination request.

 Possible values are:

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

 - NWDAF\_OVERLOAD: The NWDAF is overloaded.

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

 UserDataConOrderCrit:

 anyOf:

 - type: string

 enum:

 - APPLICABLE\_TIME\_WINDOW

 - NETWORK\_STATUS\_INDICATION

 - type: string

 description: >

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

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

 description: |

 Possible values are:

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

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

 UeMobilityOrderCriterion:

 anyOf:

 - type: string

 enum:

 - TIME\_SLOT

 - type: string

 description: >

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

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

 description: |

 Possible values are:

 - TIME\_SLOT: The ordering criterion is the time slot.

 UeCommOrderCriterion:

 anyOf:

 - type: string

 enum:

 - START\_TIME

 - DURATION

 - type: string

 description: >

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

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

 description: |

 Possible values are:

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

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

 NetworkPerfOrderCriterion:

 anyOf:

 - type: string

 enum:

 - NUMBER\_OF\_UES

 - COMMUNICATION\_PERF

 - MOBILITY\_PERF

 - type: string

 description: >

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

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

 description: |

 Possible values are:

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

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

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

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